



U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION  
National Policy

**ORDER  
1110.152**

Effective Date:  
02/12/09

**SUBJ:** Safety Management System (SMS) Aviation Rulemaking Committee

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**1. Purpose of This Order.** This order constitutes the charter for the Safety Management System (SMS) Aviation Rulemaking Committee (ARC) that is designated and established pursuant to the Administrator's authority under Title 49 of the United States Code, Section 106(p)(5).<sup>1</sup>

**2. Audience.** This order is written for FAA Aviation Safety (AVS) including the Associate Administrator for Aviation Safety (AVS-1), the Office of Aviation Safety Analytical Services (ASA), the Office of Rulemaking (ARM), Flight Standards Service (AFS), Aircraft Certification Service (AIR), and the Office of Aerospace Medicine (AAM).

**3. Where Can I Find This Order.** You can find this order on the MyFAA web site:  
[https://employees.faa.gov/tools\\_resources/orders\\_notices/](https://employees.faa.gov/tools_resources/orders_notices/)

**4. Objectives And Scope Of Activities.**

a. An ARC will enable the FAA to respond effectively in developing SMS rulemaking and implementation requirements, as well as the compliance guidance applicable to FAA certificate holders, certain product manufacturers, applicants, and employers. The ARC is expected to evaluate the public comments provided to the FAA in response to an Advance Notice of Proposed Rulemaking (ANPRM), as well as a notice of proposed rulemaking (NPRM) regarding the AVS SMS program. The ARC will provide the FAA recommendations, which may include proposals for rulemaking, suggested processes, policies and guidance, and any further action it determines the agency should contemplate in developing and implementing SMS requirements. Products prepared by the ARC are expected to aid the FAA's development of SMS requirements and guidance to facilitate product/service providers in meeting regulatory safety requirements and corresponding FAA oversight of their performance. As part of its task, the ARC may also review existing regulations and make recommendations to amend or delete them as consistent with its mission.

b. FAA Order VS 8000.367 ("AVS SMS Requirements") is the basis for the ARC's work on how AVS will address its responsibilities for management and oversight of its regulated

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<sup>1</sup> The Acting Administrator's Order 8000.369 (September 30, 2008) provides guidance for implementation of a common FAA SMS. The order includes requirements for FAA organizations to establish guidance for their own SMS activities and their industry segment(s) on implementing SMS. The Air Traffic Organization (ATO) has operated an SMS for the last three years under Air Traffic Safety Oversight Service (AOV) oversight. The Airports Organization (ARP) is developing and implementing airport-specific SMS requirements. ARP is engaged in rulemaking projects to develop a state's safety program to ensure an acceptable level of safety and draft policies and guidance consistent with FAA's safety mission and ICAO Annex - 14 (Aerodromes). AVS, ARP, and AOV regularly share information and are in close coordination regarding their respective SMS rulemaking efforts.

product/service providers. The ARC must respect the key elements outlined in the AVS SMS Requirements Order when it provides the FAA recommendations with respect to changes. Appendix B of the Order addresses the SMS requirements of product/service providers and it is expected that this will be the primary focus of the ARC's recommendations.

c. The ARC, serving in an advisory capacity, is expected to present and discuss whatever input, guidance, and recommendations its members consider critical to the FAA's ultimate disposition, development, and implementation of an SMS rule, and necessary guidance and policy.

**5. Deliverables.** The following deliverables have been established for the ARC:

**a. Provide Recommendations Based on Public Comments to an Advance Notice of Public Rulemaking (ANPRM) and Other Issues the FAA May Want the ARC to Consider.** The ARC will review and provide recommendations to the FAA after considering the relevant public comments to the ANPRM. The FAA may also submit additional issues for the ARC to address that were not part of the ANRPM. Provided the FAA decides to proceed with rulemaking, the ARC's recommendations will be considered by the FAA in its preparation of a notice of proposed rulemaking (NPRM). The ARC may submit its recommendations in a single report using any desired format. The FAA may deem it necessary to develop specific tasks based on an analysis of the ANPRM public comment results.

**b. Provide Implementation, Guidance and Policy Recommendations.** The ARC will provide a report detailing its implementation, guidance and policy recommendations as well as any other recommendations it desires to make with respect to the requirements, implementation and oversight of a SMS. The ARC is not expected to draft detailed orders or other specific guidance documents, but is expected to contribute by addressing the application of key SMS principles and attributes to a level sufficient for the FAA to understand and consider going forward as it develops orders and other guidance documents.

**c. Provide Recommendations Based on Public Comments to a Notice of Proposed Rulemaking (NPRM).** Provided the FAA decides to proceed with rulemaking, the ARC will review and provide recommendations to the FAA after considering the relevant NPRM public comments. The ARC recommendations will be considered by the FAA rulemaking committee in its response to these comments and in its publication of a final rule. The ARC may submit its recommendations in a single report using any desired format.

**d.** The Associate Administrator for Aviation Safety (AVS-1) may propose additional tasks as necessary in support of a potential SMS rulemaking program. The ARC may also make requests of the Associate Administrator for the addition of other tasks it deems relevant to the success of the SMS program.

**e.** If the FAA decides to proceed with a rulemaking program after review of both the public and ARC comments to the ANPRM, the project schedule will likely result in FAA development and publishing of its NPRM during the same time the ARC is also developing its guidance and policy recommendations. During this time if it becomes necessary for the FAA to discuss specific issues with the ARC that could be considered ex parte communication, the FAA designated federal official (DFO) must produce formal meeting minutes describing a summary of

the discussions and who was in attendance. The DFO will be responsible for disclosing this communication in accordance with DOT Order 2100.2, Policies for Public Contacts in Rule Making.

**6. Schedule.** A master schedule will be maintained by the Associate Administrator for Aviation Safety. The Associate Administrator may extend scheduled deadlines as necessary and may also amend the ARC's tasking to ensure that the objectives and the scope of the activities are met.

## **7. Organization and Administration.**

**a.** The Associate Administrator for Aviation Safety shall have the sole discretion to appoint members or organizations to the committee. The committee shall consist of members of the aviation community, including the public and/or other federal government entity representatives of various viewpoints.

**b.** The Associate Administrator for Aviation Safety shall receive all committee recommendations and reports. The Associate Administrator, through the Office of Aviation Safety and Analytical Services, ASA, shall be responsible for providing administrative support for the committee, including additional resources and personnel that may be necessary to support the ARC's activities at ASA's discretion.

**c.** The Associate Administrator for Aviation Safety is the sponsor of the committee, and shall select three industry chairs for the committee. The tri-chairs will provide the leadership for the ARC and shall, with concurrence of the DFO:

(1) Determine, in conjunction with the other members of the committee, when a meeting is required.

(2) Arrange notification of all committee members of the time and place for each meeting.

(3) Formulate an agenda for each meeting, provide the agenda at least one week prior to the meeting, and conduct the meeting.

(4) Form working groups and coordinate between meeting activities as necessary to conduct its business in the most efficient manner possible.

(5) Invite other parties to assist the ARC by developing and/or providing information that the ARC may consider necessary to meet its tasking.

**d.** The Associate Administrator for Aviation Safety will also select the designated federal official (DFO) to represent the FAA. The DFO will serve as the focal point between the ARC and the FAA. The DFO shall also:

(1) Be responsible for coordinating FAA positions and concerns relative to issues discussed by the ARC.

- (2) Be the point of contact between the ARC and the Associate Administrator for Aviation Safety for raising any issues or concerns the ARC may have.
- (3) Manage the administrative aspects of the ARC.
- (4) Address any ex parte issues that may arise in accordance with FAA and DOT policy.

## **8. Membership.**

**a.** The membership of the committee may include representatives from the following public and government organizations:

- (1) US industry representatives; including representatives from air carriers, manufacturers, repair stations, and other private sector aviation industry associations, advocacy groups, and providers.
- (2) A representative of the Federal Aviation Administration to serve as the DFO, and
- (3) Foreign authorities and ICAO representatives (Note: While these members will not vote on committee issues, they will be encouraged to fully participate in committee discussions).

**b.** The membership shall represent a variety of points of view, interests, and knowledge of the objectives and scope of the committee. Committee members will be expected to contribute fully in all areas of the committees' work. Each member will be considered to represent the position of the organization(s) they represent. Therefore, it is the responsibility of each ARC member to fully communicate discussions and decisions within their respective organizations.

**c.** Each member of the ARC should identify an alternate representative who will attend only those meetings that the member cannot attend. Alternates will only be allowed to vote on committee issues when the member cannot attend.

**d.** If the ARC finds it necessary to seek guidance from others outside of the ARC's membership to assist as subject matter experts or as part of a working group, these individuals should be invited to participate by the ARC tri-chairs. Such participation will be advisory in nature and these individuals will not vote on committee issues.

**9. Costs And Compensation.** The estimated operating cost (including pro rata share of salaries of FAA employees) is \$2.5 million. Non-government representatives serve without government compensation and bear all costs related to their participation on the committee.

**10. Public Participation.** Interested persons or organizations who are not members of this committee, but wish to attend a meeting, must request and receive approval in advance of the meeting from the tri-chairs and the DFO.

**11. Availability Of Records.** Subject to the conditions of the Freedom of Information Act, 5 U.S. Code, Section 522, records, reports, agendas, working papers and other documents that are made available to or prepared for or by the Committee shall be available for public inspection and copying at the Office of the Associate Administrator for Aviation Safety, 800 Independence

Avenue SW, Washington, DC 20591. Fees shall be charged for information furnished to the public in accordance with the fee schedule published in Part 7 of Title 49, Code of Federal Regulations.

**12. Public Interest.** The formation of the SMS ARC is determined to be in the public interest in connection with the performance of duties imposed on the FAA by law.

**13. Effective Date And Duration.** This committee is effective February 12, 2009. The committee shall remain in existence for 3 years, unless sooner terminated or extended by the Administrator.

**14. Distribution.** This order is distributed to the Associate Administrator for Aviation Safety, the Assistant Administrator for Policy, Planning, and Environment, the Office of the Chief Counsel, the director of the Office of Aviation Safety Analytical Services, and the director and division level in the Aircraft Certification Service, Flight Standards Service, and the Office of Aerospace Medicine; and the director level of the Offices of Rulemaking, Budget, Financial Management, and International Aviation.

**15. Background.**

a. At its most basic, SMS is a management system for integrating safety activities into normal day-to-day business practices. The FAA, through its Office of Aviation Safety (AVS), envisions product/service provider organizations will integrate into their operations and management a systematic risk-based and process-oriented approach to managing safety; including changes to necessary organizational structures, accountabilities, policies and procedures. The FAA is considering SMS rulemaking to further enhance the practice of managing safety and oversight of that management. Such an approach stresses not only compliance with technical standards, but increases emphasis on those management systems that ensure risk management and safety assurance.

b. Current regulatory requirements impose technical specifications for products and delivery of services, however they do not address the framework within which the safety of those products and services are to be managed. SMS requires a proactive approach to discovering and correcting problems before they exhibit safety consequences. SMS also includes processes that seek to identify potential organizational breakdowns and necessary process improvements which thus allow management to address a safety issue before a noncompliant or unsafe condition results. SMS is not a substitute for compliance with FAA regulations or FAA oversight activities. Rather, an SMS would ensure compliance with safety-related statutory and regulatory requirements.

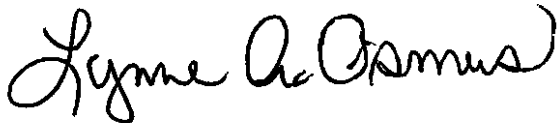
c. For these reasons, the FAA and other government and industry members of the global aviation community seek to develop and implement a structured, comprehensive framework for safety management. The FAA supports alignment with the International Civil Aviation Organization (ICAO) SMS framework. The FAA also supports international alignment, acknowledgement, and reciprocal acceptance of other civil aviation authorities' (CAAs) SMS requirements and their oversight systems.

d. SMS will also create a framework for the relationship between the FAA and the product/service providers it oversees. FAA's oversight strategies will be closely linked to the structure and performance of the product/service provider's SMS. As a result, the FAA seeks to

gain industry input at the earliest stage in support of its development of requirements, implementation strategy, and guidance that will serve as the basis of the FAA AVS SMS program. The FAA has determined that the establishment of an Aviation Rulemaking Committee (ARC) will best help it meet the desired goal of maximizing the breadth and depth of industry input in the process.

e. The FAA expects that the rulemaking will likely result in amendments to 14 CFR parts 21, 119, 121, 125, 135, 141, 142, and 145, and associated guidance documents (e.g., manuals, advisory circulars, operations specifications), as necessary, including incorporating existing ICAO, CAA, and other product/service provider best practices.

f. AVS first established a foundation for SMS in FAA Order VS 8000.1 (“Safety Management System Doctrine”). The Order provides the doctrine that AVS services and offices should consider in implementing a common AVS SMS and in developing an SMS rule for FAA product/service providers. The Order describes SMS as having four components or “pillars” – safety policy, safety risk management, safety assurance, and safety promotion. AVS subsequently developed a set of SMS requirements in FAA Order VS 8000.367 (“AVS SMS Requirements”). This Order details the principles AVS services/offices and industry product/service providers are to follow under oversight of an AVS line of business.



Lynne A. Osmus  
Acting Administrator

# **Safety Management System (SMS) Aviation Rulemaking Committee (ARC)**

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## **SMS ARC Recommendations**

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Final Report

March 31, 2010

**TABLE OF CONTENTS**

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**TABLE OF CONTENTS** ..... i

**1.0. BACKGROUND** ..... 1

**2.0. SUMMARY OF ARC WORKING GROUP ACTIVITIES** ..... 1

**3.0. SMS ARC RECOMMENDATIONS** ..... 1

    3.1. Should the FAA issue regulations on SMS? Why or Why not? ..... 2

    3.2. Who should SMS regulations apply to? Why or Why not? ..... 3

    3.3. What should the SMS regulations address?..... 4

    3.4. What should the guidance material address? ..... 6

    3.5. Explanation of the SMS ARC recommendations..... 6

**APPENDICES**..... 9

**APPENDIX A – OPERATIONS AND TRAINING WORKING GROUP REPORT**

**APPENDIX B – MAINTENANCE WORKING GROUP REPORT**

**APPENDIX C – DESIGN AND MANUFACTURING WORKING GROUP REPORT**

**APPENDIX D – SMS ARC MEMBERS, WORK GROUP PARTICIPANTS, AND SUPPORT**

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## 1.0. BACKGROUND

By FAA Order 1110.152 the FAA established the Safety Management System (SMS) Aviation Rulemaking Committee (ARC). The SMS ARC was chartered to provide recommendations to the FAA on the development and implementation of SMS regulations and guidance.

On July 23, 2009, an Advance Notice of Public Rulemaking (ANPRM) was issued (74 FR 36414) requesting public comments on a potential SMS rulemaking which would require certain 14 CFR part 21, 119, 121, 125, 135, 141, 142, and 145 certificate holders, product manufacturers, applicants, and employers to develop and implement SMS. Public comments were due October 21, 2009.

The first deliverable requested from the SMS ARC by its charter is to provide the FAA with recommendations based on a review of the public comments to the ANPRM. This report constitutes the SMS ARC delivery of recommendations.

## 2.0. SUMMARY OF ARC WORKING GROUP ACTIVITIES

In order to effectively and efficiently review the ANPRM comments and provide recommendations to the FAA, the ARC established three Working Groups. These Working Groups represent the major communities of interest who would likely be affected by an SMS rule. The three Working Groups are:

- Operations and Training Working Group,
- Maintenance Working Group, and
- Design and Manufacturing Working Group.

To support development of recommendations, the three Working Groups reviewed the comments submitted to the ANPRM and developed a summary of industry sector responses to identify key issues, concerns, and any recommendations submitted by the public regarding possible SMS requirements and aligned the comments to the questions posed by the FAA (listed below in Section 3.0). In addition, the Maintenance and the Design and Manufacturing Working Groups conducted gap analyses comparing existing regulations to the requirements in FAA Order 8000.367, *Aviation Safety (AVS) Safety Management System Requirements, Appendix B – Product/Service Provider SMS Requirements*. From this review and alignment, the Working Groups developed high-level recommendations for SMS requirements that address the questions posed by FAA.

## 3.0. SMS ARC RECOMMENDATIONS

The FAA asked the ARC to answer the following questions in development of its recommendations:

- Should the FAA issue regulations on SMS? Why or Why not?
- Who should SMS regulations apply to? Why or Why not?
- What should the SMS regulations address? Describe concepts, and if necessary; to convey a concept, provide example regulatory text.
- What should the guidance material address? Describe general concepts (details of guidance will be addressed in a future ARC recommendation).
- Explanation of the SMS ARC recommendations.
  - Justification (reasoning) for rule change.
  - Explanation of benefits (and any data you have to support these benefits).
  - Explanation of costs (and any data you have to support these costs).
  - Harmonization with international standards.

This section provides the ARC's recommendations in response to the questions listed above which are generally applicable across all industry sectors. Detailed comments and recommendations from the Operations & Training, Maintenance, and Design & Manufacturing Working Groups on behalf of their respective sectors are available as Appendices to this report.

### 3.1. Should the FAA issue regulations on SMS? Why or Why not?

Subject to the issues listed below, the ARC believes that the FAA should issue regulations on SMS. However, it was noted that several SMS concepts are already covered by existing regulations to various degrees. In addition, while the recommendation is for the FAA to develop and issue SMS regulations, the ARC believes the following issues/conditions must be addressed:

- *Protection of SMS Safety Information and Proprietary Data* – There must be protection of safety information and proprietary data from disclosure and use for other purposes. Safety information is vitally important to an SMS. Without the development, documentation, and sharing of safety information SMS benefits will not be realized. Protecting safety information from use in litigation (discovery), Freedom of Information Act (FOIA) requests, and FAA enforcement action is necessary to ensure the availability of this information, which is essential to SMS. The ARC believes that this issue can only be adequately addressed through legislation in the case of discovery, subpoena, and FOIA requests. This protective legislation must be in place prior to promulgation of an SMS rule. In addition, the ARC recommends either a new regulation or a revision and strengthening of existing part 193, Protection of Voluntarily Submitted Information to include SMS information. FAA should also establish policy or regulation which provides limits on enforcement action applicable to information that is identified or produced by an SMS.
- *Alignment with ICAO SMS Framework and International Acceptability* – The FAA regulations must be aligned and consistent with the ICAO SMS Framework and there must be international acceptance of product/service provider SMS. This topic is touched on in many of the other subsections in Section 3. However, Section 3.5.4 discusses this topic in detail.
- *Phased Promulgation of SMS Regulations* – Promulgation of SMS regulations needs to be phased (i.e., separate rulemakings) to provide time necessary for the development of appropriate industry sector-specific requirements and applicability, and the development of necessary FAA guidance. This will allow both the industry and the FAA to better understand how to effectively and efficiently implement SMS requirements before promulgating the rule. Section 3.2 discusses this topic in detail.
- *Phased Implementation of SMS Requirements* – Regulations should accommodate phased implementation of the SMS elements. Implementation methodology should be addressed in the guidance documents. It should be based on experience with SMS, impact on the safety in the aviation system, and the ability of FAA to oversee SMS (See sections 3.2 and 3.3 for more information).
- *Recognize Existing Systems and Processes* – While accommodating all current FAA regulations, the SMS regulations must acknowledge and permit incorporation of existing voluntary company and FAA safety programs and processes that fit (or can be adapted to fit) the SMS construct. It is important to allow organizations to build upon existing systems and processes rather than require them to build a whole new safety system. In addition, SMS should not be an add-on to the operational system, but rather part of the operational system. The FAA must allow industry organizations as much flexibility as possible so that it can efficiently and effectively implement SMS.
- *Recognize Existing Regulations/Requirements* – The ARC noted that many of the tenets of SMS are already addressed in existing requirements. Therefore, those existing requirements should be recognized in the development an SMS regulation. The FAA should also consider whether additional elements could be added to existing regulations to cover the components of SMS rather than issue a new SMS regulation (see Section 3.3).
- *Scalability and Flexibility* – The regulations must accommodate a broad range of organizations from small operators and manufacturers to large organizations holding multiple types of certificates/approvals and having various business arrangements. Scalability must also be addressed along with applicability (see Section 3.2).
- *Consistency in Requirements for Holders of Multiple Certificates* – If an organization holds multiple certificates, it should be able to implement one SMS that covers all the certificates. In

addition, it should expect that the FAA will consistently apply SMS requirements across those certificates.

- *FAA Plan for SMS Oversight Activity and to Ensure Consistency* – The FAA must ensure that sufficient planning, policy and guidance, and workforce training are in place prior to SMS implementation. This will accommodate efficient, timely, and objective assessment and oversight of SMS. With SMS, the FAA must increase its emphasis on a systems approach to oversight. In addition, the plan should specifically address consistent application of the regulations and policies to ensure consistency of the oversight.
- *Alternative Strategies for SMS Implementation* – For certain industry sectors, the FAA should consider alternative implementation strategies for SMS. For example, integration of SMS into existing regulations, FAA guidance, or industry consensus standards may be more appropriate and effective than regulation.
- *SMS Does Not Change Existing Regulatory Standards* – The SMS must not change existing standards established by regulation. For instance, part 21 certification procedures and airworthiness requirements are prescribed by regulations and cannot be changed by SMS requirements and processes.

### 3.2. Who should SMS regulations apply to? Why or Why not?

If the FAA decides to pursue an SMS rule, the ARC noted that organizations certificated pursuant to 14 CFR parts 21, 119, 121, 125, 135, 141, 142 and 145 as listed in the ANPRM should be included, as well as 14 CFR part 91 subpart K. This will ensure consistency of applicability with ICAO's SMS Framework. The ARC further recommends that promulgation of new regulations proceed in a logical and orderly fashion, with the prioritization based on the potential safety benefit, as well as industry experience and regulatory oversight readiness (please refer to the table at the end of this section for more specific information).

In addition, the following issues/conditions must be addressed:

- *Scalability and Impact on Small Businesses* – The ARC believes that the impact on small businesses could be significant. Therefore, additional study/research should be conducted to better understand this impact and how it might be mitigated.
- *Flowdown of Requirements* – The FAA must not require a flowdown of SMS requirements to suppliers, particularly of product/service providers, to multiple other organizations that are required to have an SMS. Therefore, the FAA must not embed the SMS requirements into the programs or manuals referenced by part 145.205, part 121.379, and part 135.437, which would require such a flowdown. The regulation must not require a supplier to meet multiple sets of higher-level organizations' SMS requirements.
- *Phased Implementation* – A phased approach to implementation of SMS requirements is necessary both within individual companies, as well as across the system. Pursuant to meeting the requirements of the ICAO SMS Framework, it is generally agreed that organizations with international commercial operations should implement SMS sooner rather than later. However, the ARC recognizes the different levels of SMS experience among the various communities in the aviation system. Therefore, the ARC recommends that operations and maintenance organizations implement SMS before training, design, and manufacturing organizations as illustrated in the table below. Regarding phased implementation within an organization, the ARC recommends that the FAA use a model similar to the ICAO implementation model and the model used by Flight Standards (AFS) pilot projects. In these models, the levels of implementation are attained over time. The proposed levels of implementation are illustrated in the table at the end of this section, and they are based on the AFS pilot project model.
- *Phased Promulgation* – Phased promulgation will allow earlier deployment of new regulations in the area of greatest operational exposure and greatest implementation experience, while allowing the necessary time for development of sector-specific guidance and operation of pilot programs

## Safety Management System Aviation Rulemaking Committee Recommendations

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for remaining certificate and approval holders. For instance, the Design and Manufacturing community has less experience, and some challenges, in how to apply the SMS rule when an organizational certificate does not exist. By contrast, many commercial operators are participating in SMS pilot projects with AFS, and therefore, they have a foundation of experience with the SMS.

The ARC recommends the following phased implementation and phased promulgation schedule:

<b>Phased Implementation and Phased Promulgation Schedule</b>		
<b>1a (Rulemaking 1)</b>  121, and 145.205 (service providers on 121 Approved Vendor List (AVL))	<b>Level 1 – Planning and Organization</b>	<b>12 months after effective date</b>
	<b>Level 2 – Reactive Processes</b>	<b>24 months after effective date</b>
	<b>Level 3 – Proactive and Predictive Processes</b>	<b>36 months after effective date</b>
<b>1b (Rulemaking 1)</b>  135 and 145.205 (service providers on 135 AVL)	<b>Level 1 – Planning and Organization</b>	<b>36 months after effective date</b>
	<b>Level 2 – Reactive Processes</b>	<b>48 months after effective date</b>
	<b>Level 3 – Proactive and Predictive Processes</b>	<b>60 months after effective date</b>
<b>1c (Rulemaking 1)</b>  Additional 145 (not covered in Implementation 1a or 1b), 91K, 125, 141, and 142	<b>Level 1 – Planning and Organization</b>	<b>60 months after effective date</b>
	<b>Level 2 – Reactive Processes</b>	<b>72 months after effective date</b>
	<b>Level 3 – Proactive and Predictive Processes</b>	<b>84 months after effective date</b>
<b>2 (Rulemaking 2)</b>  21 Design Approval Holder (DAH) / Production Approval Holder (PAH)	<b>Level 1 – Planning and Organization</b>	<b>12 months after effective date</b>
	<b>Level 2 – Reactive Processes</b>	<b>24 months after effective date</b>
	<b>Level 3 – Proactive and Predictive Processes</b>	<b>36 months after effective date</b>

### 3.3. What should the SMS regulations address?

The ARC acknowledges the work that went into the development of FAA Order 8000.367, *Aviation Safety (AVS) Safety Management System Requirements, Appendix B – Product/Service Provider SMS Requirements*. However, it also believes that the level of detail in Appendix B is inappropriate for an overarching SMS rule. Therefore, the ARC recommends that the rule be written at a level consistent with the ICAO SMS Framework, which would include the following:

1. Safety Policy and Objectives
  - 1.1 – Management commitment and responsibility
  - 1.2 – Safety accountabilities
  - 1.3 – Appointment of key safety personnel
  - 1.4 – Coordination of emergency response planning
  - 1.5 – SMS Documentation
2. Safety Risk Management

## Safety Management System Aviation Rulemaking Committee Recommendations

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- 2.1 – Hazard identification
- 2.2 – Risk assessment and mitigation
- 3. Safety Assurance
  - 3.1 – Safety performance monitoring and measurement
  - 3.2 – The management of change
  - 3.3 – Continuous improvement of the SMS
- 4. Safety Promotion
  - 4.1 – Training and education
  - 4.2 – Safety communication

Aligning FAA SMS requirements with the ICAO framework would promote international acceptability of U.S. product/service provider SMS with all ICAO member states and interoperability among certificate holders, which is discussed in Section 3.5.4.

The ARC acknowledges that many of the tenets of the SMS are already met by existing regulations and by processes and systems within industry organizations. The FAA must determine if a stand-alone rule for SMS is preferable to embedding the necessary components of SMS into existing regulations. The ARC generally agreed that a stand alone rule for SMS would be acceptable. The single rule approach would promote consistent requirements for multi-certified organizations, as well as facilitate interoperability between SMSs of organizations in the various sectors.

However, the Maintenance Working Group opinion was divided on this issue. Small maintenance organizations were in favor of an embedded rule within part 145, while the larger repair station organizations supported the single rule approach. The gap analyses indicated that existing regulations contain requirements that are duplicative with SMS requirements. Concerns were expressed that FAA may not be able to remove redundancies, which would cause undue burden on industry organizations. To help alleviate the issue of redundancy, the ARC recommends that the guidance materials explain where existing regulations contain requirements related to SMS and the degree to which they satisfy the SMS requirements.

In addition, the FAA must ensure that the level of SMS required complexity imposed on a small organization will not:

- Interfere with the company's ability to pursue its business. or
- Impose a degree of SMS data analysis that would result in insufficient time left to develop, implement and monitor risk mitigation procedures.

Time and resource constraints are recognized as scalability challenges when attempting to adapt ICAO SMS Framework elements to very small organizations. For example if the SMS rule requires a safety officer to report to the CEO, how would this work in a one-person part 135 charter organization, or one-person part 145 repair station in which they are both the same person? Unless addressed, this could result in either no benefit, or possibly even a negative benefit, in regards to the safe operation of the company.

Also, the rule must allow for the SMS to be documented as: (1) a separate manual; (2) a set of documents; or (3) incorporated into the existing manual system. This flexibility will allow the organization to document the SMS in the way that best fits its operations, while still providing FAA appropriate insight into the organization's SMS for assessment and oversight.

Finally, the FAA should “accept” rather than “approve” an organization's SMS. “Acceptance” should reduce bureaucratic overhead that another certification/approval would require within the FAA and industry organizations.

### 3.4. What should the guidance material address?

As stated in Section 3.3 (above), the ARC recommends a high-level set of requirements consistent with the ICAO SMS Framework. Detailed guidance is necessary, and the ARC recommends that the guidance material be simple, flexible, efficient and sector/community specific. In particular, the guidance material should specifically address the application of safety risk management and safety assurance requirements in the regulated organizations. The ARC notes that while there is a lot of SMS guidance material currently available, much of it is:

- academic in nature,
- directed toward operators, and
- not necessarily specific to the organizations and activities to which SMS requirements will be applied.

The guidance material should provide implementation standards and strategies, as well as oversight expectations. It should address the concept of matching the size and complexity of an organization's SMS with the size and complexity of the organization's business operations. It should also identify where existing regulations contain requirements related to SMS.

In essence, the guidance material must address all of the issues/concerns highlighted by the ARC throughout Section 3 of this report, with a particular emphasis on the bulleted lists in Sections 3.1 and 3.2. This will allow consistent application of the requirements to ensure that the safety benefits are realized while maximizing the likelihood of efficient and cost-effective implementation within the applicable organizations.

Because the guidance material is necessarily sector specific, the FAA should review the Working Groups' specific recommendations regarding what the guidance material should include. Therefore, please refer to the Working Group reports in the Appendices for more detailed recommendations:

- Operations and Training Working Group Summary: Appendix A.
- Maintenance Working Group Summary: Appendix B.
- Design and Manufacturing Working Group Summary: Appendix C

### 3.5. Explanation of the SMS ARC recommendations.

#### 3.5.1. Justification (reasoning) for rule change.

The current U.S. aviation system has achieved unprecedented levels of safety, resulting in an extremely low, but nearly stable, accident rate. The ARC believes that the effective application of system safety principles across the system will improve safety. Without systemic change, ongoing operation of the system would likely result in essentially the same very low accident rate. However, as the volume of flights increases over time, the overall number of accidents can be expected to increase. Therefore, the ARC notes that SMS is the next step in the evolution of safety in aviation based on processes and tools to systematically identify hazards and mitigate the risk associated with those hazards.

In addition, the ARC emphasizes that most organizations already have various proactive safety management programs in place that are not currently required by regulation and the ARC wants to ensure that the implementation of SMS regulations will not diminish or detract from those effective safety programs. The ARC also recognizes that with proper implementation of SMS regulations even those effective safety programs can be enhanced. Therefore, the ARC believes there would be a potential safety benefit to civil aviation and the air transportation system if a consistent set of SMS regulations were promulgated.

It is also generally agreed that one of the key drivers for an SMS rule is the agreement with ICAO. Even if the FAA decided not to implement an SMS rule, there is still a need for organizations that sell products or services outside of the U.S. to show compliance. As a result, it is important that the FAA ensure

## Safety Management System Aviation Rulemaking Committee Recommendations

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consistency with the ICAO SMS Framework and facilitate international acceptability (see Section 3.1 and 3.3).

### 3.5.2. Explanation of benefits (and any data you have to support these benefits).

The ARC found it difficult to quantify the perceived or possible benefits of SMS. However, there was anecdotal evidence of cost savings and cost avoidance with organizations that have implemented major tenets of SMS. In any event, the ARC acknowledges the potential for the benefits in the bulleted list below to be realized as a result of SMS. However, please note that these benefits are highly dependent on the existing safety programs and systems within the organization, as well as the specifics of the regulation and the regulatory compliance activities.

- Within the overall aviation system:
  - Industry safety data available that allows for data-driven rulemaking by FAA and other Civil Aviation Authorities (CAA)
  - Standardized hazard identification and accident/incident mitigation strategies
  - Shared best practices in safety management among aviation organizations
  - Common safety language and increased data sharing capabilities both within and among aviation organizations
  - Failure to meet ICAO SMS standards will impair the ability of U.S. organizations to operate internationally
- Within organizations with SMS:
  - Improved safety process capability
  - Operational efficiencies as a result of knowing where problems exist and fixing them
  - Improved organizational decision-making
  - Proactive safety management and safety promotion
  - Better communication and ability to roll-up data to a big picture level (especially in large organizations)
  - Documented system to capture employee knowledge and experience
  - Improved employee involvement
  - Insurance premium reductions
  - Reduction in duplication of systems and processes
  - Early intervention resulting in reduction of property damage and regulatory audit findings
  - Official recognition of existing safety processes, programs, and best practices

### 3.5.3. Explanation of costs (and any data you have to support these costs).

The ARC was not able to estimate costs with any level of fidelity. This is primarily because few organizations provided cost information and the spectrum of organizations providing this information is so diverse that even the estimated cost data that is available is not universally applicable. However, the Maintenance and Design and Manufacturing Working Groups included cost estimates provided by constituents in their reports, which can be found in the Appendices to this report.

The ARC generally agrees that requirements should be kept at a high-level, which would allow the organizations to adapt their current processes to meet regulatory requirements. If an inordinate amount of time or resources is required to show regulatory compliance or conduct safety analyses causing resources to be diverted from actual risk mitigation, the costs could outweigh the potential benefits.

The ARC identified sources of additional incremental initial and recurring costs that might be incurred as a result of an SMS rule in the bulleted list below. However, please note that these costs are highly dependent on the existing safety programs and systems within the organization, as well as the specifics of the regulation and the regulatory compliance activities.

- Program integration

- Training
- Gap analyses development
- Regulatory compliance activities
- Documentation/manuals
- Software
- Development and implementation of voluntary employee reporting systems
- Data gathering/collection
- Data analyses
- Consulting fees
- Internal workforce development
- Safety promotion
- Periodic reviews

The ARC recommends that the FAA task the ARC to collect additional cost information to assist in the cost benefit analysis. In addition, the ARC recommends that the FAA research the cost impact of SMS on industry organizations.

### **3.5.4. Harmonization with international standards.**

The ARC recommends that FAA SMS regulations and guidance be closely aligned and consistent with the ICAO SMS Framework. The ARC also recommends that FAA work with ICAO to establish international acceptability of State product/service provider SMS. Many organizations are affected by regulations of multiple State CAAs. Proliferation of multiple, slightly differing SMS standards could force organizations to accomplish redundant compliance demonstrations and to develop and maintain redundant documentation for compliance, all without a benefit to safety.

SMS interoperability will also require the flow of information between suppliers and customers in different States, and between organizations and regulators in different States. If a single industry-standard process and format can be used, this will avoid multiple reporting of the same data in several slightly different formats required for different authorities or customers. Therefore, promulgation of an SMS regulation should not discourage industry development of standardized data reporting formats.



**APPENDICES**

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**APPENDIX A – OPERATIONS AND TRAINING WORKING GROUP REPORT**

**APPENDIX B – MAINTENANCE WORKING GROUP REPORT**

**APPENDIX C – DESIGN AND MANUFACTURING WORKING GROUP REPORT**

**APPENDIX D – SMS ARC MEMBERS, WORK GROUP PARTICIPANTS, AND SUPPORT**

**APPENDIX A – OPERATIONS AND TRAINING WORKING GROUP REPORT**

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# **Operations and Training Working Group Report**

Revision Date - March 9, 2010

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<b>1 Introduction</b>	<b>1</b>
1.1 O & T comments addressing the five questions required by the ARC . . . . .	1
1.2 Excerpts of specific comments/exceptions requiring additional review by the ARC and Tri Chairs	1
1.3 O & T Comments for ANPRM Recommendations (Public Comments). . . . .	1
<b>2 O &amp; T comments addressing the five questions required by the ARC</b>	<b>2</b>
<b>3 Specific comments and exceptions requiring additional review</b>	<b>8</b>
3.1 O & T recommendation to scalability . . . . .	8
3.2 Elements essential to an operators SMS . . . . .	8
3.3 Exception to a regulation requirement for Part 125 and 142 operators: . . . . .	9
<b>4 O &amp; T Comments for ANPRM Recommendations (Public Comments)</b>	<b>10</b>
4.1 Summary . . . . .	10
<b>5 General Comments</b>	<b>10</b>
5.1 From the Aircraft Owners and Pilots Association (AOPA) . . . . .	10
5.2 From the Helicopter Association International (HAI). . . . .	11
5.3 An Anonymous Commenter . . . . .	13
5.4 A Corporate Aviation Manager . . . . .	14
5.5 A Chief Pilot of a Corporate Flight Department . . . . .	14
5.6 Regional Air Cargo Carriers Association (RACCA). . . . .	15
5.7 From An Individual . . . . .	17
5.8 From the National Transportation Safety Board . . . . .	17
5.9 From a Retired FAA Employee. . . . .	18
5.10 From the U.S. Small Business Administration’s (SBA) Office of Advocacy (Advocacy). . . . .	19
5.11 From The American Society of Safety Engineer. . . . .	20
5.12 From the Aircraft Electronics Association (AEA) . . . . .	21
5.13 An Individual with a Background in Operations and Maintenance . . . . .	22
5.14 From USC Aviation Safety and Security Program . . . . .	23
5.15 From the Union of Canadian Transportation Employees (UCTE) . . . . .	24
5.16 From Powell of Paou . . . . .	24
5.17 An Individual. . . . .	26

---

5.18 Data Edge Coded Media, Inc. . . . .	27
5.19 From an individual. . . . .	27
<b>6 Responses to the questions posted in the ANPRM</b>	<b>28</b>
6.1 Question 1 . . . . .	28
6.2 Question 2 . . . . .	34
6.3 Question 3 . . . . .	43
6.4 Question 4 . . . . .	67
6.5 Question 5 . . . . .	70
6.6 Question 6 . . . . .	75
6.7 Question 7 . . . . .	80
6.8 Question 8 . . . . .	81
6.9 Question 8.a. . . . .	87
6.10 Question 8.b. . . . .	92
6.11 Question 8.c. . . . .	95
6.12 Question 9 . . . . .	100
6.13 Question 10 . . . . .	106
6.14 Question 11 . . . . .	110
6.15 Question 12 . . . . .	116
6.16 Question 13 . . . . .	122
6.17 Question 14 . . . . .	128
6.18 Question 15 . . . . .	136
6.19 Question 16 . . . . .	139
6.20 Question 17 . . . . .	147

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# 1 Introduction

This report contains the comments, recommendations, and summary of the Operations and Training Working Group participants. The Operations and Training Working Group consists of a diverse group of audiences and evaluators from Part 21, 119, 121, 125, 135, 141, 142, 145, certificate holders and manufacturers, design and manufacturing, Federal Aviation Administration (FAA) contributors, and subject matter experts developing or implementing a Safety Management System.

The Operations and Training (O & T) Working group divided this report into three parts:

- 1.1 O & T comments addressing the five questions required by the ARC
  - 1.1.1 Should the FAA issue regulations on SMS? Why or Why not?
  - 1.1.2 Who should SMS regulations apply to? Why or Why not?
  - 1.1.3 What should the SMS regulations address? Describe concepts, and if necessary; to convey a concept, provide example regulatory text. Please note that this language will be subject to FAA revision.
  - 1.1.4 What should the guidance material address? Describe general concepts (details of guidance will be addressed in a future ARC recommendation).
  - 1.1.5 Explanation of the SMS ARC recommendations.
    - A. Justification (reasoning) for rule change.
    - B. Explanation of benefits (and any data you have to support these benefits).
    - C. Explanation of costs (and any data you have to support these costs).
    - D. Harmonization with international standards
- 1.2 Excerpts of specific comments/exceptions requiring additional review by the ARC and Tri Chairs
- 1.3 O & T Comments for ANPRM Recommendations (Public Comments)

In addition to commenting on the five ARC questions, the O & T working group addressed the ANPRM recommendations using specific criteria providing feedback and suggestions to each question. This task was to determine if the comments and/or recommendations were valid, realistic, and achievable. The following questions are the additional cross-references used to validate the ANPRM recommendations.

- Is it valid to the SMS rule? Yes or no
- Is it valid to the discussion? Yes or no
- Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
- Is it a scope related comment? Yes or no

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## 2 O & T comments addressing the five questions required by the ARC

### Operations and Training

#### 1. Should the FAA issue regulations on SMS? Why or Why not?

The aviation industry has reached a safety plateau and must develop a systems approach for improved gains in safety. The U.S. must not fall behind the rest of the world, where many countries have developed state-of-the-art approaches to mitigating risk through the implementation of SMS.

Hence yes, The FAA should issue regulations on SMS. To be in compliance with ICAO (Annex 6 - 3.2.4) a regulation would and should be required. All carriers must have an SMS based on the ICAO mandate.

The FAA should issue regulations on SMS based on the following comments from the subject matter experts at the O and T training groups:

1. Compliance with international requirements
2. Great business sense (evolving and advance to the next level)
3. Standardize the bidding process for potential business as numerous customers are requiring smaller carriers to have an SMS. This applies to both international and smaller domestic carriers.
4. Including basic SMS principles and the 4 pillars in the bidding process reflects an organizations participation in SMS and a commitment to safety.
5. 3<sup>rd</sup> tier companies have been noticed to avoid code shares with companies without an SMS
6. Current ICAO standards, international operations and an integrated SMS across lines of business
  - a. ICAO has already issued requirements in Annex 6 Parts 1 and 2.
    - Later on, a holistic SMS system will need all parts (maintenance, ATS, airports, FAA, etc) to speak a common language
  - b. “unfair” regulatory burden if this only applies to air carriers
    - Annex 6 does require SMS for maintenance, ATS, Aerodromes
  - c. Why is this even a question?
    - Basic regulations are an inherent FAA function.
  - d. Standardization and understanding among inspectors and operators would be difficult
    - Canadian experience: has not been that difficult
  - e. Should focus on what to do, not how to do it

One constant has affected the way the Operations and Training group have addressed all questions. Scalability of SMS is a primary concern for smaller organizations. The following are the scalability issues that affect smaller organizations:

1. The work is intense for a 5 person organization to implement SMS due to its magnitude.
2. Lack of manpower and resources
3. The requirement for inspectors (oversight) for smaller organizations will also pose numerous challenges.
4. Encompassing so much to incorporate diverse parts of aviation, will pose enforcement issues, subjective issues, and will be contrary to administrative issues.
5. “One size fits all” rule

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### Operations and Training Recommendations to address scalability:

Air Carriers, Airports, Design and Manufacturers and ATC organizations could be required to have an SMS, but scalability must be addressed for smaller organizations under the above ICAO required organizations.

Scalability of SMS has to be considered for smaller organizations. The work is intense for a one person organization to implement SMS and encompassing so much to incorporate diverse parts of aviation, will pose enforcement issues, subjective issues, and will be contrary to administrative issues. "One size fits all" will not be appropriate for a one person organization.

The scalability can be addressed by the following recommendations:

1. The recommendation is that the SMS should address certain required elements for any organization such as safety risk management process, hazard identification process, mitigation strategies, emergency preparedness, safety assurance, oversight requirements, reactive and proactive mitigation, and continual improvement; but all SMS elements should be made a requirement for anyone with direct involvement in the air transportation system (thus protecting the traveling public)
2. Smaller organizations (sub-contractor or vendor) can use a recognized industry code of practice as an implementation strategy to support SMS requirements.
3. Air Carriers, Airports, Design and Manufacturers, and ATC organizations are required to have an SMS while suppliers, vendors, and outside providers are not required to have an SMS.
4. The supplier, vendor, and outside providers of such organizations should be inserted into an SMS by providing data and participate in the hazard identification process. Sharing aggregate data between product/service providers and vendors will facilitate the identification of common risks, consistent risk assessment strategy, and effective allocation of resources.

### 2. Who should SMS regulations apply to? Why or Why not?

All certificated operators as named in the NPRM excluding part 91 at the onset. Eventually ALL operators should be regulated either directly or through alternate means such as IS-BAO.

The regulation must apply to:

1. Every service provider engaged in international operations
2. Local and international; **Note:** Should include specific rules and regulations for local and international carriers to implement an SMS.
3. Levels of implementation; **Note:** The agency has to draw a line to distinguish the levels of SMS implementation. It has to be defined, documented, and if necessary added in the regulation.
4. Alliance, code share, and if necessary for smaller airlines
5. Apply to everyone with aviation service provisions



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6. ICAO Annex 6 Part 1 (commercial) and Part 2 (non-commercial > 12.5K) requires an SMS.
    - a. Air Carriers (121, 135, 129)
    - b. Air operators (125)
    - c. Op Specs (121, 135, 129, 145)
    - d. Management Specs (91K)
    - e. Part 142 training centers – Reference section 3, 3.3 for additional detail
    - f. Part 141 training (maybe)
    - g. Part 61 training (difficult to accomplish)
    - h. Part 65 Training (difficult to accomplish)
    - i. Part 147 training (maybe)
    - j. Public aircraft (Defined by FAA)
    - k. Part 145 repair stations (may include some limitations)
    - l. Part 21 manufacturer (production vs. design)
    - m. QMS vs. SMS & cost/benefit for vendors and subcontractors (non-certificated)
    - n. Part 23 aircraft manufacturers (nope-within 21)
    - o. Part 25 aircraft manufacturers (nope-within 21)
    - p. Opt-in process for non-covered operations to demonstrate compliance
  3. **What should the SMS regulations address? Describe concepts, and if necessary to convey a concept, provide example regulatory text. Please note that this language will be subject to FAA revision.**
    1. SMS regulations should require the establishment of Safety Policy that establishes both framework and accountability nexus of such policy.
    2. SMS is a problem solving process that is intrinsically tied to the management of the organization.
    3. This concept requires safety be a driving force behind all operational decisions made by senior management.
    4. A component of this concept is a safety policy statement signed by the Senior Executive Officer of the Operator attesting to the management commitments, organizational expectations, and their ultimate accountability
    5. The basic tenets of SMS regulation shall encompass a framework that promotes feedback, non-punitive/voluntary safety reporting with safeguards to protect source data, analysis that manages change processes and maintains solid quality assurance. The SMS concept should be build on what every organization already has in their safety program instead of re-creating the SMS concepts. The basic tenets of the SMS concept should be considered prior to building the regulation:
      - a. Scope of operations covered
        - Policies and procedures
        - Risk management
        - Safety Assurance & Internal Evaluation
        - Safety Promotion
      - b. Guidance will need to include
        - Conceptual details and process development
        - Tools
    6. From Canadian Regulations (107.02): The application for the holder of a certificate referred to in section 107.01 shall establish, maintain and adhere to a safety management system.

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7. Establishing a Safety Management System (107.02)
  8. The applicant for, or the holder of, a certificate referred to in section 107.01 shall establish, maintain and adhere to a safety management system.
  9. Safety Management System (107.03): A safety management system shall include
    - a. a safety policy on which the system is based;
    - b. a process for setting goals for the improvement of aviation safety and for measuring the attainment of those goals;
    - c. a process for identifying hazards to aviation safety and for evaluating and managing the associated risks;
    - d. a process for ensuring that personnel are trained and competent to perform their duties;
    - e. a process for the internal reporting and analyzing of hazards, incidents and accidents and for taking corrective actions to prevent their recurrence
    - f. a document containing all safety management system processes and a process for making personnel aware of their responsibilities with respect to them;
    - g. a process for conducting periodic reviews or audits of the safety management system and reviews or audits for cause of the safety management system; and
    - h. any additional requirements for the safety management system that are prescribed under these Regulations
  10. Any proposed SMS regulations should require:
    - a. top management to document roles and responsibilities for implementing, maintaining, and monitoring the effectiveness of the SMS
  11. That the SMS should include, at a minimum:
    - a. Identification of safety hazards;
    - b. a documented process for the continuous identification and analysis of operational safety hazards, and the risks associated with those hazards, which includes:
      - a non-punitive reporting program
    - c. ensures that remedial action necessary to maintain an acceptable level of safety is implemented;
      - a documented process for the analysis of safety risk and a process to mitigate risk
    - d. provides for continuous monitoring and regular assessment of the safety level achieved; and
      - a process to ensure that the risk controls are developed and implemented
    - e. aims to make continuous improvement to the overall level of safety
      - a documented process for the periodic review of the safety program to assess performance against safety objectives

**4. What should the guidance material address? Describe general concepts (details of guidance will be addressed in a future ARC recommendation).**

1. Guidance materials should offer implementation standards and oversight expectations.
  - Concept strategies should require collaborative interaction between the operator and the FAA on the “how to” develop and implement SMS within the operation.

- 
- Size and complexity should be addressed within all guidance materials.
  - Ensure consistency of interpretation by the oversight organization
2. The guidance material should include the following:
- Guidance for FAA inspectors defining how to accept and approve an SMS for entities that require having an SMS.
  - Implementation strategies for FAR parts. Detail specific guidance for individual FAR parts e.g. AC, implementation guidance, assurance guidance etc. (i.e. the way CASS is implemented in 121.373 yet magnified and expanded in an Advisory Circular)
  - Training of inspectors; addressing the training requirements and defining the oversight responsibility.
  - Conformance of air carriers and defined guidance for smaller and larger organizations.
  - Concept of risk based compliance by oversight organizations as a component of SMS

**5. Explanation of the SMS ARC recommendations.**

**1. Justification (reasoning) for rule change.**

- Mandate by the ICAO
- To provide a tool to identify latent hazard identification and incident/accident mitigation strategies in order to require risk based management models.
- Modernize current safety rules and guidelines

**2. Explanation of benefits (and any data you have to support these benefits).**

- Standardized hazard identification and accident/incident mitigation strategies across the industry
- Reduced incident/accident costs (e.g. lost time, aircraft damage, insurance premiums, litigation etc...)
- Realized operational efficiencies that come with identifying where your problems lie.
- Promotes a learning/safety culture
- Identification of inherent risk
- By applying principles of the SMS to the operational areas of our business that lack a comprehensive risk-based approach to manage safety; organizations have seen some successes in reducing risk, decreasing operating costs, and managing safety through a structured process.
- In addition to impact the application of SMS has in the operating areas of the business it has also brought definition and advancement to the operational areas by bridging the gap and allowing for a common and robust risk-based system to manage safety. This implementation has evolved a discipline of adding the risk assessment process to other areas of the business
- There are anecdotal reports of tangible cost savings and cost avoidance benefits from various organizations, but these were not specified due to proprietary reasons.

**3. Explanation of costs (and any data you have to support these costs).**

- Investment in SMS will be offset by benefits realized over the long term (see 5 b. above).
- Benefits realized outweigh cost of implementation (assuming correct implementation)

- 
- Code share agreements

**Note:** Based on the current SMS framework requirements, every operator will require a significant amount of infrastructure to implement and maintain a system to manage safety both as a basic requirement and in spirit. Certain organizations participating in the pilot project have spent significant resources in the implementation of SMS, but have not tracked costs associated with the implementation; investment in technological systems, basic SMS familiarization, risk assessment training, and dedicated program resources; however there have been significant costs for implementation and the investments are justified. Such organizations strongly believe in the SMS concept.

- There are anecdotal reports of tangible cost savings and cost avoidance benefits from various organizations, but these were not specified due to proprietary reasons.

#### **4. Harmonization with international standards.**

- Harmonization must be accomplished using ICAO Annex 6 framework.
- Harmonization to ICAO standards.
- Must be integrated with international rules

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### 3 Specific comments and exceptions requiring additional review

This section contains excerpts of specific comments/exceptions requiring additional review by the ARC and Tri Chairs. These excerpts are comments from the ANPRM recommendation document requiring special handling and review by the rule making committee to ensure all nuances to the requirement are taken into consideration. Additionally, this section contains O & T recommendations for scalability, essential elements to the SMS by individual contributors, and concerns by subject matter experts in the industry.

#### 3.1 O & T recommendation to scalability

- 3.1.1 Air Carriers, Airports, Design and Manufacturers and ATC organizations could be required to have an SMS, but scalability must be addressed for smaller organizations under the ICAO required organizations.
- 3.1.2 Scalability of SMS has to be considered for smaller organizations. The work is intense for a one person organization to implement SMS and encompassing so much to incorporate diverse parts of aviation, will pose enforcement issues, subjective issues, and will be contrary to administrative issues. "One size fits all" will not be appropriate for a one person organization.
- 3.1.3 The scalability can be addressed using the following recommendations:
  - A. The SMS should address certain required elements for any ICAO required organization such as safety risk management process, hazard identification process, mitigation strategies, emergency preparedness, safety assurance, oversight requirements, reactive and proactive mitigation, and continual improvement; but all SMS elements should be made a requirement for anyone with direct involvement in the air transportation system (thus protecting the traveling public)
  - B. Smaller organizations (sub-contractor or vendor) can use a recognized industry code of practice as an implementation strategy to support SMS requirements.
  - C. Air Carriers, Airports, Design and Manufacturers, and ATC organizations are required to have an SMS while suppliers, vendors, and outside providers are not required to have an SMS.
  - D. The supplier, vendor, and outside providers of such organizations should be inserted into an SMS by providing data and participate in the hazard identification process. Sharing aggregate data between product/service providers and vendors will facilitate the identification of common risks, consistent risk assessment strategy, and effective allocation of resources.

#### 3.2 Elements essential to an operators SMS

- 3.2.1 Referencing Annex 6, Amend 33, Attachment J, and the Framework for the State Safety Program listing what data must be collected from operators and how it must be collected, analyzed, and shared. Attachment J Section 3.2 states "The State has established

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mechanisms to ensure the capture and storage of data on hazards and safety risks at both an individual and aggregate State's level.

- A. In order for the rule to work, the data to be collected, in what form, how defined and counted, and how reported must be identified in the NPRM/rule at the very outset. If the rule does not address this in the NPRM, there is a potential for organizations to set up their own IT systems and when the rule becomes effective the FAA will require reporting that is not compatible. There is also a potential to have all systems modified or monitored manually in order to report to the FAA.
- B. One recommendation is to arrive at an agreement on definitions, quantities, measures, the data to be collected and the mode of reporting at this early stage to prevent additional changes or modifications to the rule at the later time.

3.2.2 The ANPRM does not list Part 91 Operators; Annex 6, Part II Section 3.3.2 requires that G/A operators above 12.5 or turbojets have and maintain an SMS. It also places the requirement directly upon the operator and not the State. A potential solution; suggest that FAA issue an Advisory Circular (which would be non-regulatory) for G/A acft above 12.5 that operate internationally. That could provide the guidance to the operators that protects them when operating in a foreign country where there is a possibility for a foreign oversight organization requesting to see the operators SMS.

3.3 Exception to a regulation requirement for Part 125 and 142 operators:

**NOTE:** *The content of this comment should be considered for further deliberation and is vital to a regulation requirement for Part 125 and Part 142 operators.*

We believe that Part 121 operations should be required to have an SMS since they pose the greatest potential risk to the public safety when considering industry size. We believe that Part 135 operators should be included since they also operate in common carriage. While the need may exist for this small class of air carriers, they are perhaps the most vulnerable to the financial impact of implementation. Design of an SMS for Part 135 should be considered separately from the design for Part 121 air carriers. Part 145 providers should also be included since they provide significant services to all operators. Success with SMS has been demonstrated in other industries where “production” is involved. The systems analysis approach to production as undertaken pursuant to Part 145 has proven to be superior to a random sampling process of the end product. Similarly, Part 142 Training Centers should be included in SMS rulemaking. They provide valuable training assistance to many air carriers and crew training has figured in many of the most recent air carrier accidents. We would question the need for an SMS for Part 125 operators (private carriage) since they do not hold themselves out to the public and must maintain a high degree of safety in their operation to ensure a continuing client base and survivability. [65] Reviewed by O & T. The regulation should be required for certificated organizations, and certain portion of the regulations should be a requirement for the non-certificated organizations.

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## 4 O & T Comments for ANPRM Recommendations (Public Comments)

This section consists of all the ANPRM recommendations and public comments submitted via the FAA docket system on October 21, 2010. Each recommendation and public comment from questions 1 through 17 have been reviewed and validated by the O & T working group participants.

### 4.1 Summary

The Federal Aviation Administration (FAA) published an Advanced Notice of Proposed Rulemaking (ANPRM) on July 23, 2009 (74 FR 36414) requesting public comments on a potential rulemaking requiring certain 14 CFR Part 21, 119, 121, 125, 135, 141, 142 and 145 certificate holders, product manufacturers, applicants and employers to develop a Safety Management System (SMS). In the ANPRM the FAA posed 17 questions and asked for input from the public on additional information regarding SMS not addressed by the questions. The FAA received 90 comments in response to the ANPRM from a variety of commenters including aircraft designers and manufacturers, service facilities, air carriers, trade associations and private citizens. Sections 5,6, and 7 summarize the comments the FAA received in response to the ANPRM and the review by the Operations and Training working group. Most of the material below is in the form of direct quotes from the public comments.

Section 5 presents general comments addressing information regarding SMS not addressed in the questions asked in the ANPRM. Section 6 addresses other comments and section 7 presents each question from the ANPRM followed by the responses from the public. All sections are divided into the comment from the ANPRM and the operations and training comments from the subject matter experts based on the products or services provided by the commenter:

#### 4.1.1 Comments from the ANPRM document

#### 4.1.2 Operations and Training comments

#### 4.1.3 Other Comments – comments from commenters that do not fit the categories listed above or that are involved in more than one of the product/service areas listed above.

## 5 General Comments

### 5.1 From the Aircraft Owners and Pilots Association (AOPA)

AOPA is concerned that SMS puts into place a continuous cycle of problem identification and resolution that may have unintended consequences. While at the outset this process may sound prudent, it has the very real potential of undercutting the Administrative Procedure Act, which is the backbone of public input into the Federal rulemaking process, and the Regulatory Flexibility Act, which requires balance between proposed regulatory requirements and the capabilities and resources of those being regulated.

There is probable potential that, under an SMS rule, certificate holders would have to spend resources to address a problem that would not meet the standards of rulemaking. This would

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create de facto rulemaking and would directly undercut the Administrative Procedure Act and Regulatory Flexibility Act.

In addition to undercutting the Administrative Procedure Act and Regulatory Flexibility Act the FAA needs to clearly communicate who owns an SMS. If, for example a Part 135 certificate holder sets up and follows an SMS, can an FAA inspector come in and tell the certificate holder that they are not following their SMS well enough? Could the FAA violate a certificate holder for not following their own program to the extent the FAA feels they should? If the answers to these questions are “yes” the concerns over bypassing the two Acts mentioned are amplified.

AOPA recognizes that SMS is already posing a challenge to U.S. certificate holders that operate internationally. The FAA needs to propose an SMS program that allows international operators to comply with ICAO and does not bypass existing U.S. governing the rulemaking process.

Before the FAA decides to move forward with SMS, the FAA needs to define its regulatory role and how SMS will operate within the Administrative Procedure Act and Regulatory Flexibility Act. To the extent that these questions remain unanswered, many of the questions currently posed in the ANPRM are premature (i.e., are current guidance materials sufficient). [29.1]

#### 5.1.1 Operations and Training Comments:

A. Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)

1) Yes, it is valid to the SMS rule.

B. Is it valid to the discussion? Yes or no

1) Yes, it is valid to the discussion. Regulatory flexibility act, it requires the agencies to look at smaller businesses.

C. Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?

1) The APA and the Regulatory flexibility Act comments are relevant to the AOPA’s concern regarding smaller businesses.

D. Is it a scope related comment? Yes or no

1) Yes, it is scope related comment to some extent in relation to the international operations. The APA applies to all and the Regulatory Flexibility Act relates to the smaller organizations.

2) Other: The FAA needs to better clarify and communicate the inspectors role in the guidance and oversight process.

#### 5.2 From the Helicopter Association International (HAI)

The Helicopter Association International is a not-for-profit, professional trade association which represents the interests of the civil helicopter community. HAI has approximately 3,000 members, inclusive of 1,600 member companies in more than 74 nations. Our members fly over 5,500 helicopters approximately 2.5 million flight hours per year. Our primary focus is safety.



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HAI strongly supports the basic philosophy and concept of Safety Management Systems as outlined in the ANPRM. A structured, risk-based approach to managing safety which incorporates safety into the fabric of the day-to-day decision-making process of an organization is an essential step in establishing a safety culture.

In 2002, the HAI Safety Committee established a “Platinum Program of Safety” to encourage member helicopter operators to fly to higher standards. This program was designed to enhance a company’s safety culture by requiring operating companies to have a documented safety program, a detailed Operations Manual and a comprehensive training program and to maintain a system of constant safety re-evaluation and reviews through periodic, internal and external safety audits. This “Platinum Program” was, in fact, an early step towards SMS. It incorporated many of the principles which now are recognized as the building blocks of an effective SMS program.

Since then, HAI’s support for the basic principles and potential value of SMS has been further validated and reinforced through the findings of the International Helicopter Safety Team (IHST). The IHST is an international helicopter industry initiative, launched in 2005, to pursue an ambitious, self-imposed goal of reducing the worldwide helicopter accident rate worldwide by 80% over a ten year period. This initiative was launched by HAI in conjunction with the American Helicopter Society International, other associations, helicopter manufacturers, suppliers, pilots, maintenance personnel and operators, and with the encouragement and participation of representatives from the FAA, Transport Canada, EASA and other international regulatory and safety organizations.

The IHST initiative is a data driven process, based on the example of the highly successful Commercial Aviation Safety Team (CAST) effort to identify hazards and risks that cause or contribute to accidents and to identify and implement mitigation strategies to address those hazards and to manage the associated risk.

In the IHST’s initial round of accident data analysis, the U.S. Joint Helicopter Safety Analysis Team (US JHSAT), made up of industry and government safety experts, analyzed 197 U.S. helicopter accidents from calendar year 2000. That analysis identified shortcomings in “management and/or safety culture” as a contributing factor in 81 of the 197 accidents---46% of the accidents reviewed.

#### 5.2.1 Operations and Training Comments:

- A. This type of analysis data may be used a justification for SMS regulation and may be well suited for a preamble to any final rule.

As a result of this analysis, the IHST’s very first recommended mitigation strategy was the development and promotion of a Safety Management System Toolkit, designed to assist small and medium sized operators in establishing and implementing voluntary SMS programs. The IHST SMS Toolkit, developed with the assistance of the FAA, includes the 4 basic cornerstones of an effective SMS as outlined in the SMS ANPRM (Safety Policy, Safety Risk Management, Safety Assurance and Safety Promotion), and is totally consistent with the guidance provided in AC-120-92, Introduction to Safety Management systems for Air Operators.

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Subsequent ongoing accident analysis, by the U.S. JHSAT, identified Safety Culture and Management deficiencies as a contributing factor in 45% of the 174 U.S. accidents in calendar year 2001. More recently, analysis conducted by the European Joint Helicopter Safety Analysis Team determined that Safety Culture and Management was a contributing factor in 48% of the 186 accidents in EASA member states between 2000 and 2005.

#### 5.2.2 Operations and Training Comments:

- A. This type of analysis data may be used a justification for SMS regulation and may be well suited for a preamble to any final rule.

The data is compelling, and HAI continues to actively promote the voluntary use of SMS and the IHST SMS Toolkit in its publications, safety outreach programs and with a CD video resource.

So, yes, HAI recognizes the potential safety benefits of SMS and wholeheartedly supports the concept and philosophy of SMS. As a result, our association is actively participating in the SMS Aviation Rulemaking Committee (SMS ARC) which has been chartered by the FAA to provide industry input into the development of a possible rulemaking document for the implementation of SMS.

However, in direct response to Questions 14, 15 and 16 of the ANPRM, HAI submits that any future SMS rulemaking designed to mandate and guide the implementation of SMS must be scalable, must be phased in gradually and must take into account the differences between Part 121 Air Carriers and other segments of the aviation industry. [79.1]

#### 5.2.3 Operations and Training Comments:

- A. SMS rulemaking designed to mandate and guide the implementation of SMS must be scalable, must be phased in gradually and must take into account the differences between Part 121 Air Carriers and other segments of the aviation industry. [79.1]
- B. SMS rulemaking and implementation must be data driven both internally and externally.

### 5.3 An Anonymous Commenter

An anonymous commenter said “FAR Part 91 turbine-powered airplanes that are excluded from the requirement of FAR Part 125 are experiencing a rapid growth in their complexity of operations. By excluding operators of these aircraft from the requirement of developing a safety management system (SMS) will allow a large sector to miss the point; safety is an organizational issue with latent deficiencies....ICAO has adopted an amendment to Annex 6 that applies to all turbine-powered aircraft and aircraft over 5,700 kgs (12,500 lbs), introducing the requirement for safety management systems, training programs, and fatigue management programs. For the United States not to adopt the ICAO SMS requirement for this complex sector of aviation exposes a large sector of the industry to hazards and risks that are unnecessary.” [4]

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### 5.3.1 Operations and Training Comments:

Part 125 operators with an operating certificate would be covered as defined yesterday. Large aircraft operators with a letter of deviation authority (LODA) from Part 125 would need a process to opt-in. The alternative is to mandate SMS for Part 91.

### 5.4 A Corporate Aviation Manager

A Corporate Aviation Manager at H-E-B is supportive of the ANPRM and "...would like to see a single Business Aviation Standard....By mandating an operational SMS and IS-BAO registration to satisfy proof of SMS compliancy, we can ensure that our profession is taking all the appropriate steps to mitigate risk." [5]

#### 5.4.1 Operations and Training Comments:

- A. Is supportive of the ANPRM and would like to see a single Business Aviation Standard by mandating an operational SMS and IS-BAO registration to satisfy proof of SMS compliance.
- B. Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - 1) Yes, insofar as the SMS rule should apply to certain Part 91 operations.
- C. Is it valid to the discussion? Yes or no
  - 1) Yes
- D. Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
  - 1) Assuming that SMS becomes a requirement for Part 91, IS-BAO could be considered as an acceptable means of compliance with the requirements.
- E. Is it a scope related comment? Yes or no
  - 1) This comment expands the scope of what is currently being considered under any proposed SMS rule.

### 5.5 A Chief Pilot of a Corporate Flight Department

A Chief Pilot of a corporate flight department urges the FAA "to adopt IS-BAO as the standard for a Safety Management System required in this proposed regulation. We are currently in the process of implementing IS-BAO voluntarily in our department as our flight standard because we recognize the value of the ten years of development, and the recognition by ICAO member states over many additional years of development. There is no other standard at this time that is recognized worldwide and IS-BAO is an excellent tool for developing policies and procedures that manage risk and promote a vibrant safety culture." [7]

#### 5.5.1 Operations and Training Comments:

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A. Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)

1) Yes, it is valid to the SMS rule with respect to the current proposal that is FAA is already looking along the lines of IS-BAO

B. Is it valid to the discussion? Yes or no

1) Yes, it is valid to the discussion.

C. Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?

1) Yes, it is relevant with respect to the current proposal that is FAA is already looking along the lines of IS-BAO

D. Is it a scope related comment? Yes or no

1) No, it is not scope related.

## 5.6 Regional Air Cargo Carriers Association (RACCA)

### 5.6.1 Rule versus policy

There has been some discussion as to whether a Federal Aviation Regulation specifically applicable to SMS is required to satisfactorily address International Civil Aviation Organization mandates, or that policy and guidance documents requiring compliance with SMS concepts by operators (as opposed to a rule) would be the best answer. Particularly as it applies to small operators, RACCA believes that appropriate statements in operators' Part 135-mandated manuals addressing the basic precepts of SMS would be a better answer than attempting to develop a "one size fits all" rule – and that such an option should be available if an SMS rule is ultimately enacted.

### 5.6.2 Operations and Training Comments:

While the commenting party feels that guidance documents would suffice in application of SMS concepts, the group believes that rule making is the appropriate vehicle for SMS application and implementation.

### 5.6.3 Large versus small operators

Whatever rule or policy is ultimately adopted, RACCA believes that it must be sufficiently flexible to –

Satisfy needs of the large airline operator as well as the small "mom-and-pop" flying service with two airplanes and four employees, the simple single-airplane single-pilot Part 135 operator, or – if SMS will be mandated for Part 145 operators – the one-man avionics shop

Satisfy whatever is required by applicable FAA rule and/or policy and, in turn, ICAO requirements

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5.6.4 Operations and Training Comments:

The group agrees that all SMS regulation must be scalable.

5.6.5 Training and standardization of inspector workforce

It is pretty clear that when large-scale implementation of SMS (or SMS-like policies) requires a paradigm shift from inspection/enforcement/sanction-based activity by Aviation Safety inspectors to one centered upon support and improvement – rubbed against the wide range of experience and personalities among District Office personnel – the FAA will face a substantial training and standardization challenge.

5.6.6 Operations and Training Comments:

The group agrees with the commenting party in that training and standardization of the inspector workforce is essential to the success of any SMS regulation and that such inspector workforce shall assist and provide expertise in the implementation and long term execution of any SMS program.

5.6.7 Legal protection for operators

A. RACCA has a major concern about poisonous outcome of a scenario such as this:

- 1) Operator X implements an FAA-approved or –accepted SMS
- 2) The SMS includes risk analysis features, including determination of acceptable levels of risk for various activities or operations
- 3) Employee Y engages in acceptable activity Z – determined to have an acceptable level of risk according the Operator X’s SMS – and gets injured
- 4) Employee Y sues Operator X seeking compensation for the injury
- 5) Employee Y’s attorney cross-examines Operator X in court: “Do you mean to tell the jury that you knew that Activity Z was risky, but you told poor Mr. Y to do it anyway?”
- 6) The court awards Employee Y \$1 million
- 7) Operator X quickly decides that participation in SMS is risky and costly, and the SMS gets lip service from that point on.

5.6.8 Operations and Training Comments:

The group believes that the commenter’s scenario reinforces the need for adequate data protections within any SMS regulation/program

Much like disclosure of confidential safety reports will quickly result in curtailment of reporting by company employees, such costly legal experiences will dampen enthusiasm for SMS among operators’ executives. Therefore, RACCA believes that legislation protecting operators from consequences of proper implementation of SMS must go hand

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in hand with FAA mandates for SMS, similar to Pilot Records Improvement Act protection afforded operators when they disclose past pilot employees' records to potential future employers. [9.1]

## 5.7 From An Individual

I believe the concept of implementing a safety management system is commendable, but have reservations about some aspects of implementation; specifically, the impact to airline manual systems. As SMS concepts are intended to be woven into the fabric of airline operations, those concepts will by necessity be incorporated into the content of a wide range of manuals utilized by airlines in their day to day operation. In the event of a revision to a safety process based on projected or experienced outcomes, I can conceive of the need for every manual within the organization needing revision to reflect the altered process. Keep in mind that these various manuals may be either FAA approved or accepted, while SMS elements are only classified as accepted.

Please consider how FAA inspectors and airlines will deal with potentially massive amounts of document changes, and what process would be in place in the event "accepted" material is incorporated into "approved" documents. Does FAA have a mechanism in place to deal with this inevitability? [18]

### 5.7.1 Operations and Training Comments:

Could be handled by referenced documents so that changes only occur in one place. Mapping strategy could assist in identifying which requirements related to specific SMS elements. Must be scalable to the size and scope of the operation. Could depend on specific FAA POI/PMI preferences. SMS would not introduce this new challenge.

## 5.8 From the National Transportation Safety Board

The National Transportation Safety Board (NTSB) recognizes the benefits of SMS programs and supports rulemaking in this area. As a result of its investigations, the NTSB has issued three safety recommendations since 2007 addressing the importance of SMS programs in 14 CFR Part 121 operations and in some operations conducted under Parts 91 and 135.

The NTSB is encouraged that the FAA is considering requirements for SMS implementation not only for 14 CFR Part 121 operators but also for commuter and on-demand operators under 14 CFR Part 135, training providers under 14 Parts 141 and 142, maintenance repair stations under 14 CFR Part 145, and product manufacturers under 14 CFR Part 21...The NTSB encourages the FAA to include corporate operations under 14 CFR Part 91 or fractional ownership operations under 14 CFR Part 91 subpart K in SMS rulemaking to allow them to benefit from the proactive management of safety by implementing SMS programs that incorporate safety policy, safety risk management, safety assurance, and safety promotion.

As the FAA moves forward with rulemaking activities in this area, it must ensure that SMS programs facilitate and do not subjugate the FAA's essential responsibility to provide direct and active oversight of operators and service providers in this industry. [27.1]

### 5.8.1 Operations and Training Comments:

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- A. The National Transportation Safety Board (NTSB) recognizes the benefits of SMS programs and supports rulemaking in this area. As a result of its investigations, the NTSB has issued three safety recommendations since 2007 addressing the importance of SMS programs in 14 CFR Part 121 operations and in some operations conducted under Parts 91 and 135.
  - B. The NTSB is encouraged that the FAA is considering requirements for SMS implementation not only for 14 CFR Part 121 operators but also for commuter and on-demand operators under 14 CFR Part 135, training providers under 14 Parts 141 and 142, maintenance repair stations under 14 CFR Part 145, and product manufacturers under 14 CFR Part 21...The NTSB encourages the FAA to include corporate operations under 14 CFR Part 91 or fractional ownership operations under 14 CFR Part 91 subpart K in SMS rulemaking to allow them to benefit from the proactive management of safety by implementing SMS programs that incorporate safety policy, safety risk management, safety assurance, and safety promotion.
  - C. As the FAA moves forward with rulemaking activities in this area, it must ensure that SMS programs facilitate and do not subjugate the FAA's essential responsibility to provide direct and active oversight of operators and service providers in this industry. [27.1]
    - 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
      - a) Yes. Recommends two things: extending SMS rule to Part 91 corporate and Part 91K operators, and that SMS not water down the FAA's oversight responsibility.
    - 2) Is it valid to the discussion? Yes or no
      - a) Yes.
    - 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
      - a) The two recommendations – extending SMS and maintaining FAA oversight responsibility – are the most relevant.
    - 4) Is it a scope related comment? Yes or no
      - a) Yes. This recommendation would also extend the scope of the SMS rule to Part 91 corporate and 91K operators, which would impose additional oversight burdens of the FAA.

#### 5.9 From a Retired FAA Employee

From a Retired FAA Employee whose background includes 27 years of service with the FAA and served as: the Director of the FAA Aircraft Certification Service; FAA Associate Administrator for Regulation & Safety; and Industry Chair of the FAA Certified Design Organization Advisory Committee: In May 2006 the FAA established an Aviation Rulemaking Committee (ARC) to make recommendations on the Certified Design Organization (CDO) concept authorized under Title 49 USC 44704. A Safety Management System (SMS) was proposed as a requirement under the CDO concept, and the ARC report, issued in May 2008, describes how an SMS might be

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regulated. The report contains a draft SMS regulation and guidance material. A copy of the report is provided with the electronic submittal of these comments, as I have been unable to find the report anywhere on the FAA web site. It is requested that the CDO ARC report be placed within docket FAA-2009-0671. The CDO ARC was advised by a previous FAA Associate Administrator for AVS that its report, and the SMS material contained therein, would be considered as a comment to the SMS ANPRM.

Over the years many safety improvements have been introduced that have made dramatic changes to air carrier and general aviation operational safety. The last major effort was the FAA's Safer Skies program in the late 90's that embodied the FAA/Industry Commercial Aviation Safety Team (CAST) process. CAST has been responsible for a dramatic increase in safety, and its efforts are continuing.

The SMS concept introduced by ICAO, that is discussed at some length in their recent proposals for Annex 6 and Annex 8 and in Document 9859 (Safety Management Manual), is another major step toward a higher level of safety and I fully indorse the SMS concept. The FAA has issued advisory material that discusses the SMS concepts and embodies the principles in the ICAO document. These are all good steps toward an understanding of the principles that must be implemented in any SMS program. [28.1]

#### 5.9.1 Operations and Training Comments:

Other: Recommendation to the FAA to review the CDO ARC content prior to excluding this from the comment criteria.

#### 5.10 From the U.S. Small Business Administration's (SBA) Office of Advocacy (Advocacy)

From the U.S. Small Business Administration's (SBA) Office of Advocacy (Advocacy): In response to the publication of the ANPRM, the SMS issue was discussed at Advocacy's regular small business aviation safety roundtable on September 22, 2009. The following comments summarize the issues raised during the roundtable discussion and in subsequent conversations with small business representatives:

##### 5.10.1 Operations and Training Comments:

- A. FAA should identify the specific safety hazard SMS is intended to address.
  - 1) The group believes this position is unacceptable and is contrary to the intent and purpose of SMS
- B. FAA should not promulgate open-ended regulations.
  - 1) The group believes this position is unacceptable and is contrary to the intent and purpose of SMS
- C. FAA should identify and mitigate specific hazards, not hypothetical risks.
  - 1) The group believes this position is unacceptable and is contrary to the intent and purpose of SMS



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- D. If SMS requirements are adopted, they should be transparent, and incorporated into the Code of Federal Regulations.
    - 1) The group agrees that SMS requirements should be placed in the CFR's in order to be actual requirements
  - E. SMS mandates should be integrated into existing quality programs.
    - 1) The group believes that existing quality programs should be integrated into SMS.
  - F. SMS could be especially costly and burdensome for small businesses.
    - 1) The concepts of scalability satisfy the commenter's assertion.
    - 2) Advocacy recommends that FAA carefully consider the impacts SMS could have on small firms and evaluate alternative approaches that would reduce those impacts. Among those alternatives, FAA should consider a tiered approach that would be scalable to the size, scope, and complexity of the operation. [31.1]

#### 5.11 From The American Society of Safety Engineer

From The American Society of Safety Engineers: The American Society of Safety Engineers (ASSE) supports FAA's proposal to require FAA's certificate holders, product manufacturers and other employers with which it does business to develop Safety Management Systems. In developing the rule, ASSE recommends:

FAA require an SMS to be done by a "competent person" consistent with the Occupational Safety and Health Administration's (OSHA's) use of the term, "(O)ne who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them."

Also, to help ensure consistency with accepted industry standards in determining appropriate professional involvement, a final rule must go one step further and reference ANSI/ASSE Z590.2-2003: Criteria for Establishing the Scope and Functions of the Professional Safety Position, which establishes for the safety profession core competencies, certifications, credentials, levels of qualifications and credentials, and learning support resources.

Consider the ability of small employers to create an SMS. We do not seek an exemption for all small employers, however. OSHA has more than adequate resources for every small employer to establish an SMS. We urge that a final rule bring attention to OSHA's resources for safety and health programs at <http://www.osha.gov/SLTC/safetyhealth/index.html> and its considerable assistance to small employers at <http://www.osha.gov/dosp/smallbusiness/index.html>.

Coordinate with OSHA. The often overlapping set of responsibilities for workplace safety and health between OSHA and federal agencies like the FAA can be difficult to determine. Current key legislative proposals to bring changes to the Occupational Safety and Health Act include provisions that would require agreements between federal agencies and OSHA when responsibilities overlap. ASSE supports those provisions and urges the FAA to establish such a positive understanding with OSHA even if such legislation is not passed into law.

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Reference voluntary consensus standards. ASSE urges the FAA to reference the appropriate voluntary consensus standards that have been adopted to advance effective safety management systems. One is ANSI/AIHA Z10-2005, Occupational Health and Safety Management Systems. Z10 provides critical management systems requirements and guidelines for improvement for an organization's occupational health and safety. Also appropriate, since risk assessment is key to effective safety management, would be references to the international consensus standards ISO/FDIS 31000 concerning risk management principles and guidelines, and IEC/FDIS 31010 concerning risk assessment techniques. Finally, since this also deals with construction, we urge reference to several A10 standards concerning management of safety systems on construction and demolition projects, including ANSI/ASSE A10.33-2004: Safety and Health Program Requirements for Multi-Employer Projects. [45.1]

#### 5.11.1 Operations and Training Comments:

Agree that the person developing the SMS should be competent. OSHA not necessarily the right definition for defining competency. Company should define qualifications for competent person in coordination with FAA. Guidance material should allow operators to comply without specific additional training. Could identify experience requirements for competent person (ie: experience requirements required for Part 119 DO/DM).

#### 5.12 From the Aircraft Electronics Association (AEA)

From the Aircraft Electronics Association (AEA): The Aircraft Electronics Association (AEA) represents over 1300 aviation businesses, including repair stations that specialize in maintenance, repair and installation of avionics and electronic systems in general aviation aircraft. AEA membership also includes instrument facilities, manufacturers of avionics equipment, instrument manufacturers, airframe manufacturers, test equipment manufacturers, major distributors, and educational institutions.

The Aircraft Electronics Association does not support the FAA's proposal to mandate an independent Safety Management System for maintenance organizations.

Notwithstanding the Association's support of the FAA's efforts to enhance aviation safety, AEA does not support the broad based approach of Safety Management Systems as proposed by the FAA in the Advanced Notice of Proposed Rulemaking.

The technical elements of risk identification, management and mitigation are all appropriate within the bounds of Title 14 of the Code of Federal Regulations; that is, as a quality management system to assure compliance with the Federal Aviation Regulations.

The unbound mandate for hazard evaluation, risk identification and risk mitigation without a cited hazard is outside the scope of the Administrative Procedures Act, therefore the proposal is unsubstantiated. In addition, since the FAA has failed to identify a specific hazard they are attempting to mitigate, it is impossible to determine if any of the discussions of an SMS program as a viable solution are proper and adequate.

There are so many different SMS programs being implemented today in every sector of aviation that herding these different approaching into a cohesive process may be completely impossible.

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The FAA's use of SMS cost and benefit economic data in the ANPRM without defining the program is inappropriate. General industry, air carriers, IATA Operational Safety Audit (IOSA), International Standard for Business Aircraft Operations (IS-BAO), Regional Air Cargo Carriers Association (RACCA), Air Cargo Safety Foundation (ACSF), Helicopter Association International, National Air Transportation Association, or National Business Aviation Association all have different programs that are generically called a "Safety Management System". An operator's SMS program may or may not be consistent with the FAA's intended rulemaking. At this time the only consistency is the name Safety Management System; there is no consistency in the performance, elements, or outcome of the programs. [64.1]

5.12.1 Operations and Training Comments:

- A. Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - 1) It is valid in that they are opposed to the rule as envisioned.
- B. Is it valid to the discussion? Yes or no
  - 1) Yes, but they oppose implementation of SMS
- C. Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
  - 1) The FAA can develop criteria to decide which organizations have a valid program for an acceptable means of compliance.
- D. Is it a scope related comment? Yes or no
  - 1) No.

5.13 An Individual with a Background in Operations and Maintenance

An Individual with a background in operations and maintenance for part 121, 129 and 135 air carriers, repair stations and an aircraft manufacturer opposes FAA requiring the development of an SMS. The commenter stated "SMS should be a voluntary program based on the company. It needs to be flexible, and not one size fits all. Unto itself, SMS will not increase safety. A safe company is a safe company and regulations will not make an unsafe company a safe one." [12.1]

5.13.1 Operations and Training Comments:

- A. Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - 1) No
- B. Is it valid to the discussion? Yes or no
  - 1) Yes, it is valid to the discussion
- C. Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?

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- 1) Yes, The comment that the regulation needs to be flexible and should not be one size fits all. Scalability

D. Is it a scope related comment? Yes or no

- 1) No it is not a scope related comment.

#### 5.14 From USC Aviation Safety and Security Program

From USC Aviation Safety and Security Program: “There are three major elements that must be integrated into the implementation of the SMS for it to be successful. First, the purpose of SMS must be clearly understood by all parties that are required to implement it. Second, the implementation measures of the rule must be engineered into the regulatory requirements before they are published not afterwards. Third, the rule must meet the requirements (Standards) that are articulated in ICAO Annexes 6 and 14.”

5.14.1 The commenter provides a detailed explanation of the purpose of SMS, the basic components of an SMS and the importance of engineering the rule prior to publication, noting three questions need to be answered:

- A. What kinds of data will an organization need to collect, analyze and document in order to operate an effective SMS? This might be called the Total SMS Data.
- B. Of this Total SMS Data what data will the FAA require to be reported on a regular basis?
- C. In what form, quantity and frequency will this data need to be provided to the FAA?

5.14.2 Operations and Training Comments:

- A. The group is in agreement that these questions must be addressed within the final rule.

The commenter emphasizes the importance of conforming with ICAO requirements and lists the basic requirements of an SMS according to ICAO. The USC Aviation Safety Management Program also noted that this rule will need to be implemented by a wide range of organizations; therefore, the SMS structure must address this situation. The commenter stated the structure must be simple and affordable enough for implementation by very small operators and “have enough capability to handle the data, data processing and integration requirements of extensive organizations the size of Delta, American and United Air Lines.” [15.1]

5.14.3 Operations and Training Comments:

Again, the group is in full agreement that any SMS must be scalable in order to be cross operationally viable.

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### 5.15 From the Union of Canadian Transportation Employees (UCTE)

From the Union of Canadian Transportation Employees (UCTE): The Union of Canadian Transportation Employees (UCTE) is the national union for Canada's non-pilot aviation inspectors. We are writing to offer some input to you as you consider SMS implementation.

Transport Canada (TC) began SMS implementation of SMS in 2005. We believe there is much the U.S. can learn from the Canadian experience.

Canada has gone too far too fast in implementing Aviation SMS. There is an increasing view among key stakeholders that significant errors have been made, particularly in the way in which oversight has been completely overhauled in favor of SMS program verification. Additionally, the lack of significant whistleblower protections, for both airline employees and the inspectorate too, has created a high degree of mistrust and suspicion in the system. Last but not least, TC has used SMS as a means to reduce its financial commitment to safe skies.

We are pleased to attach a recent UCTE Discussion Paper which compares Transport Canada SMS with other jurisdictions, including ICAO. It also recommends changes to the way in which the system is working today.

UCTE is currently in dialogue with Transport Canada on some of the issues and recommendations in this paper. We are confident that the Canadian system will be improved considerably due to this communication.

In closing, we are very pleased to see that the FAA is making a commitment to whistleblower protections and a third party accountability structure. You will note that UCTE has recommended a similar structure for Canada. [84]

#### 5.15.1 Operations and Training Comments:

Canadian experience differs from commenter. Oversight has not declined. Method of surveillance may change, but not scope. Change management is key to successful SMS integration. Also missing some referenced documents not included here.

### 5.16 From Powell of Paou

From Powell of Paou: These comments are made by an individual with both Industry and FAA Designee background.

The reference Continued Operational Safety (COS) system MARPA document recognized by FAA, and the FAA AVS safety 'components' can provide the foundation of the SMS system. The key elements:

- AVS:
  - Safety Policy
  - Safety Risk Management

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- Safety Assurance
  - Safety Promotion
  - COS:
    - Prevention
    - Tracking
    - Correction

FAA has many effective “safety documents”. Consider that the better than 100:1 reduction in fatal and non-fatal accidents per million departures for Part 121 type carriers have been achieved over the past 5 decades. That is the evidence! The FAA and Industry working to the regulations and their supporting documents deserve the credit.

The SMS definitions presented in the NPRM are acceptable for now. The ICAO safety management comments seem particularly on target. FAA's final definition may best be stated after SMS is “fleshed in.”

The System developed should, of course, look at and include lessons learned from past major aviation accidents, That is, to see what was deficient In the system or why the system did not work. Also, the development should review the space program accidents, such as Challenger and Columbia. They are important guides also. Equally important as looking at past failures, is to examine past successes! All this has been done by FAA, but again, for the SMS era is appropriate.

If there is any one point we stress for the system, it is to have each approved organization construct periodic reviews and reports (available to FAA) of its safety and compliance system record. Included would be initiatives for any further correction or prevention. Suggested is at least every 3 years or whenever some degree of responsibility for an accident develops or when solicited by FAA.

An effective SMS Program is continuous, but perhaps there should be an initial report declaring the system is set-up and with the substantiating evidence provided. Thereafter, the 3-year reports would be introspective and include a view of the past 3-year record as established by these categories as applicable to the particular organization:

- Accident and Accident rate (Fatal and non-fatal)
- Activity Level
- SAIB's
- Alert Service Bulletins
- Airworthiness Directives
- FAA Audit Non-Conformances and self audit

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A final note is that safety history on all type aircraft indicates flight operations are the dominant cause vs. all other factors. Hence, the priority would be there with support emphasis from traffic control, design, manufacturing and maintenance, for preventive influence resulting in constant safety improvement. FAA is indeed so targeting! We do note that some elements of U. S. aviation are not making the same degree of improvement as the air carriers, (i.e. helicopters).

There are many ways for FAA to get SMS matured. For example, it might be an A.C. and voluntary, not a regulatory start. It would become mandatory for those of a higher risk including those with a substandard record. However, the air carrier safety improvement over decades has been noteworthy. What we have is not broken, yet there was Colgan Air the past February. As John Hickey stated in his presentation to MARPA on October 1st, "A single accident is unacceptable'. So an advisory or voluntary approach may be clearer with the public comments, and observing the continuing safety record direction. We can't help but note (not as an excuse for inaction on SMS) that the annual fatalities on the U. S. Highways vs. U. S. Airways over recent years are over 200 to 1, U. S. air travel sets the "gold standard". [87.1]

#### 5.16.1 Operations and Training Comments:

- A. Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - 1) Yes.
- B. Is it valid to the discussion? Yes or no
  - 1) No. Appears to be a personal rant.
- C. Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
  - 1) No.
- D. Is it a scope related comment? Yes or no
  - 1) No.

#### 5.17 An Individual

An individual did not comment on SMS, but stated that helicopter tour ride operators should be required to meet the same safety and courtesy provisions as fixed wing aircraft. The commenter believes the FAA noise sensitivity recommendations should be regulations instead of recommendations. [46]

#### 5.17.1 Operations and Training Comments:

- A. Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - 1) No
- B. Is it valid to the discussion? Yes or no
  - 1) No

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C. Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?

1) No

D. Is it a scope related comment? Yes or no

1) No

#### 5.18 Data Edge Coded Media, Inc

Data Edge Coded Media, Inc. proposed a recommended architecture for handling SMS data and facilitating information processing. The proposed architecture is based on the FedEx Air Operations Model. The commenter also submitted a white paper on the FedEx Deep Office Architecture software platform (in support of SMS). [42.1, 43.1]

##### 5.18.1 Operations and Training Comments:

While the group believes information processing and facilitation is a necessary in the execution of any SMS program, we don't believe an endorsement of any software platform or tool is appropriate. However, any software platform or tool required to implement SMS should be readily available, affordable to the individual operator and user friendly.

#### 5.19 From an individual

From an individual: It is ESSENTIAL to the health and well being of so many unsuspecting tourists who ride on helicopter or other aircraft rides directed at tourists. The general public erroneously assumes (just as I did until recently) that the FAA already has some form of enforceable SMS to protect them from unscrupulous small aircraft tour operators. SMS are necessary for developing ENFORCABLE rules, not just recommendations that lack the power to regulate the safety of small scale aircraft businesses. Please, do not cave in to the whiners who are already pinching pennies to make a "go" of their businesses, for they will be the first ones to cut safety corners in an effort to save a dime. Please add teeth to your current "recommendations" by making them "Rules and Regulations" with enforceability at the local, state and federal levels. [60]

##### 5.19.1 Operations and Training Comments:

Bitter customer. ARC process conceivably would develop an SMS regulatory framework.



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## 6 Responses to the questions posted in the ANPRM

### 6.1 Question 1

Please tell us about your organization, including what products/services are provided, what FAA certificates you hold, approximate number of employees, and your approximate annual gross revenue.

- 6.1.1 From The Transport Workers Union of America, AFL-CIO (TWU): The Transport Workers Union of America, AFL-CIO represents 200,000 active and retired members in the transit, rail, and aviation industries. Specifically TWU represents 50,500 Flight Attendants, Pilot Instructors, Dispatchers, and Mechanics in the aviation industry at Airtran Airways, Alaska Airlines, American Airlines, American Eagle Airlines, Air Wisconsin, Chautauqua, Continental Airlines, Express Jet Airlines, Executive Airlines, Frontier Airlines, Hawaiian Airlines, Horizon Air Industries, Island Air, Mesaba, Pinnacle, PSA Airlines, Republic Airways, Ryan International, Southwest Airlines, Shuttle America, Spirit Airlines, Sun Country, US Airways, UPS, and World Airways. TWU offers a full range of representational services including collective bargaining negotiations, grievance/arbitration dispute resolution, and committees on health and safety, regulatory affairs, and security. [47.1] – **Reviewed by O & T, No comments**
- 6.1.2 From the Air Transport Association of America, Inc. (ATA): As of mid-2009, ATA members operate 4,085 passenger and cargo jet aircraft in daily domestic and international revenue service. In 2008, 741,408,000 passengers were emplaned in the air traffic system, both domestically and internationally. Passenger load factor averaged 79.5% of available seats. 28,383,000,000 revenue ton-miles of cargo were carried. As recently as 2006, the economic impact of commercial aviation on the U.S. economy was \$1.142 Trillion U.S. Dollars, and commercial airlines input to the U.S. Gross Domestic Product (GDP) was \$692 Billion U.S. Dollars. From January through July, 2009 U.S. passenger airlines alone employed 390,000 Full-Time Equivalent employees. [51.1] – **Reviewed by O & T, No comments**
- 6.1.3 From Air Line Pilots Association, International (ALPA): The Air Line Pilots Association, International, is an international membership organization representing the interests of professional airline pilots in the United States and Canada. Our motto, “Schedule with Safety” is more than a mere saying; it is the focus of a significant portion of ALPA’s formal structure and activity. We have air safety chairmen at each of our members’ airlines who provide a conduit for safety information both to and from our members. We work with industry and government organizations to improve and assure appropriate levels of safety in aviation operations.
- ALPA has a long history of promoting SMS and has had an SMS Project supporting the use of SMS since 2001. In fact, ALPA members and staff are actively involved in the Aviation Rulemaking Committee (ARC) on SMS with ALPA’s SMS Director serving as a co-chair of the ARC. [69.1] – **Reviewed by O & T, No comments**
- 6.1.4 From the Allied Pilots Association (APA): The Allied Pilots Association (APA) serves as the certified collective bargaining agent for all American Airlines pilots. With

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approximately 11,500 members, APA is the largest independent pilots' union in the world. APA devotes more than 20 percent of its dues income to promote aviation safety. [76.1] – **Reviewed by O & T, No comments**

- 6.1.5 From the Association of Flight Attendants – CWA (AFA): The Association of Flight Attendants-CWA (AFA) represents over 55,000 flight attendants at 20 airlines and serves as a voice for flight attendants at their workplace and within the industry. The goal of flight attendants who become part of AFA is to negotiate improved pay, benefits, working conditions and work rules and improve their safety, health and security on the job. [59.1] – **Reviewed by O & T, No comments**
- 6.1.6 From the Air Medical Operators Association (AMOA): The respondents to this survey collectively operate over 800 aircraft, the majority of which are used in helicopter EMS transport services. All the respondents are Part 135 certificate holders; many also perform services as Part 145 maintenance facilities, and some hold Part 133 and Part 137 certificates. These organizations collectively employ over 11,000 employees. [52.1] – **Reviewed by O & T, No comments**
- 6.1.7 From Delta Airlines, Inc.: Headcount: Approximately 70,000 employees. Revenue: 2009 Operational Forecast \$ 28 Billion (passenger, cargo, and other revenue). 2008 Operating Revenue Forecast: Passenger \$29.7 Billion, Cargo \$1.3 Billion, Other \$3.2 Billion, Total \$34.2 Billion [56.1] – **Reviewed by O & T, No comments**
- 6.1.8 From Virgin America Airlines: Virgin America is a Part 121 scheduled passenger airline. We have approximately 1,500 employees at our headquarters and nine domestic stations. [40.1] – **Reviewed by O & T, No comments**
- 6.1.9 From Ameriflight, LLC: Part 135 cargo airline operating 170 aircraft throughout the conterminous U.S. and into Canada, Alaska, Mexico, and the Caribbean. Fly approximately 90,000 hours per year. FAA Air Carrier Operating Certificate, FAA Approved Repair Station certificate. Approximately 600 employees. Company is privately held and revenue information is not released. [2.1] – **Reviewed by O & T, No comments**
- 6.1.10 SMS4Aviation, LLC (Formerly Tradewins) is a small family owned and operated business specializing in SMS/EMS programs for small to medium sized part 91/135 operators as well as FBO's and MRO's. The owner holds commercial pilot, Instrument, MEL, FE, A&P licenses. We utilize 7 team members at this time with the expectation that we will increase the workforce as we start more implementations. [3.1] – **Reviewed by O & T, No comments**
- 6.1.11 Jet Logistics Inc. (JLI) is an FAA certificated air carrier under 14CFR 135. The on-demand operator currently has fourteen (14) fixed wing aircraft listed on its D085 page. Four (4) of these aircraft are dedicated to operations as authorized in A024 (Air Ambulance) and the rest are utilized for on demand passenger carrying operations. JLI currently employs forty-four (44) persons and has annual gross revenues approaching eight million dollars (\$8,000,000). [6.1] – **Reviewed by O & T, No comments**

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- 6.1.12 From Miami Air International: We are a Service Provider with a FAR 121 Supplemental Certificate. We operate a total of ten (10) Boeing 737 aircraft.
- A. Boeing 737-800 (seven)
  - B. Boeing 737-700 (one)
  - C. Boeing 737-400 (two)
- 6.1.13 We have approximately 395 employees. For 2008 our gross revenue was approximately 160 million. [11.1] – **Reviewed by O & T, No comments**
- 6.1.14 From the Regional Airline Association: The Regional Airline Association (RAA) member airlines conduct approximately 50% of the U.S. scheduled domestic departures, operate some 40% of the nation’s passenger fleet and carry more than one out of every five domestic passengers. Most notably, 70% of the nation’s commercial service airports are served exclusively by regional airlines. The RAA members routinely operate internationally principally within Canada, Mexico and the Caribbean countries. [22.1] – **Reviewed by O & T, No comments**
- 6.1.15 From Omni Air International: Omni Air International is a United States Federal Aviation Administration certificated air carrier conducting operations with large passenger-carrying aircraft under 49 CFR Part 121 supplemental flight rules. Omni employs more than 1,000 staff spanning the globe, having operated on every continent except Antarctica in support of commercial and Government-sponsored travelers. [83.1] – **Reviewed by O & T, No comments**
- 6.1.16 From Aero Micronesia, Inc. d/b/a Asia Pacific Airlines: Aero Micronesia, Inc. d/b/a Asia Pacific Airlines (“Asia Pacific”) holds Air Carrier Certificate number 15IPA. We employ 40-45 people and record annual gross revenues of \$25 - \$30 million. Our principal operations and maintenance base is on the island of Guam. Our certificate is held by the Honolulu Certificate Management Office. [65] – **Reviewed by O & T, No comments**
- 6.1.17 From Chantilly Air, Inc.: Chantilly Air, Inc. is an aviation services company, providing air charter services under its 14 CFR Part 135 certificate; maintenance under its 14 CFR Part 145 certificate; aircraft storage and management services; aircraft sales; and non-commercial self-fueling operations. Chantilly Air, Inc. operates seven turbojet aircraft, and two multiengine piston aircraft. Operations are conducted both under 14 CFR Part 91 and 14 CFR Part 135.
- Chantilly Air, Inc. employs 27 employees in its flight operations, charter, maintenance, ground support, and client services departments. [81.1] – **Reviewed by O & T, No comments**
- 6.1.18 From Frontier Alaska: Frontier Alaska group holds 3 air carrier certificates, Era Aviation and Frontier Flying Service both operate scheduled and charter flights under FAR Part 121 and 135. The third certificate is Hageland Aviation, an FAR part 135 carrier, conducting both scheduled and charter flights. All three companies operate primarily

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within the State of Alaska and have approximately 700+ employees throughout the state. [67.1] – **Reviewed by O & T, No comments**

6.1.19 From Treyfect, Inc.: Treyfect is a newly formed consulting firm which specializes in assisting organizations with SMS implementation as it relates to personal, product and process (3P) safety. Treyfect is based out of Wichita, Kansas, with worldwide operations to begin January 2010. Treyfect employs three full time safety subject matter experts in the field of Occupational Safety, Aviation Safety, and Process Safety. Treyfect's team has gained highly specialized knowledge and skills related to SMS implementation and the FAA's four pillars of Safety;

- A. Risk Assessment,
- B. Risk Management,
- C. Safety Assurance, and
- D. Safety Promotion

Treyfect does not hold FAA certificates or delegations. Annual gross revenue has not been established. [23] – **Reviewed by O & T, No comments**

#### 6.1.20 Other Comments

A. From Bombardier Aerospace: Bombardier is a global transportation company, present in more than 60 countries on five continents. Bombardier operates two industry-leading businesses:

- 1) Aerospace
- 2) Rail transportation

Bombardier's 66,900 employees design, manufacture, sell and support the widest range of world-class products in these two sectors. This includes commercial and business jets, as well as rail transportation equipment, systems and services.

Bombardier is headquartered in Montreal, Canada, and its shares (BBD) are traded on the Toronto Stock Exchange. In the fiscal year ended January 31, 2009, Bombardier posted revenues of \$19.7 billion US.

B. Bombardier Aerospace

Bombardier has grown over the past 20 years as a result of the acquisition of the following companies:

- 1) Canadair (Canada);
- 2) Short Brothers (Ireland);
- 3) Learjet Corporation's assets (U.S.);

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- 4) de Havilland (Canada);
  - 5) Skyjet (U.S.).
  - 6) Today, Bombardier Aerospace employs over 32,500 employees and ranks as the world's third largest civil aircraft manufacturer. The aircraft and services provided are as follows:
    - a) Business aircraft - Learjet, Challenger and Global aircraft families;
    - b) Commercial aircraft - new C-Series program, CRJ Series and Q-Series aircraft families;
    - c) Amphibious aircraft - Bombardier 415 and Bombardier 415 MP aircraft;
    - d) Jet travel solutions - Flexjet and Skyjet;
    - e) Specialized aircraft solutions - Bombardier aircraft modified for special missions;
    - f) Aircraft services and training - aircraft parts, maintenance, comprehensive training, technical support and publications, and online services.

#### C. Bombardier Learjet

Learjet Inc. founded by Bill Lear in the 1960's in Wichita, Kansas is a U.S. corporation incorporated under the laws of Delaware and has been an indirect, wholly owned subsidiary of Bombardier Inc. since 1990. It has approximately 3,300 employees, with approximately 1,000 of those located outside of Wichita, Kansas. The primary business of Learjet is the manufacture, production and service of business aircraft. Among others, Learjet has received its delegation as an ODA Holder (ODA-501508-CE for a PC, STC and MRA ODA).

#### D. Learjet and Bombardier Services Corporation Maintenance & Service Centers

In support of the aircraft that it manufactures, Bombardier has established a network of both factory-owned and authorized service facilities worldwide. The Bombardier-owned service centers cater to both business and commercial aircraft clientele. Bombardier Aerospace includes Part 145 maintenance facilities located in Wichita, Tucson, Dallas, Hartford, Ft. Lauderdale and Bridgeport. In addition to these six factory-owned service centers, which employ over 1000 technicians and specialists, Bombardier Services Corporation operates one line maintenance station in the U.S. Bombardier and Learjet also have appointed 41 independently managed authorized service facilities and line maintenance organizations worldwide. Furthermore, Bombardier sells aircraft parts in support of all Bombardier aircraft and through Learjet has distribution centers in Chicago, Frankfurt, Narita, Sao Paulo, Singapore and Sidney.

#### E. Bombardier Aerospace Flight Operations

Bombardier carries out various flight operation activities in support of its core business including production, demonstration and flight operations. Bombardier also operates its own employee corporate shuttle and offers a full menu of private jet

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services, from charters to whole aircraft ownership programs (Bombardier Flexjet and Skyjet). Bombardier also operates the Downsview Airport, in Ontario, Canada.

The Bombardier Demonstration and Flight Operations group that supports the Bombardier Sales Team carries out operations world-wide and employs 33 FAA certificated ATP pilots some of which hold Transport Canada (TC) certificates, as well as a support staff consisting of an additional 33 employees.

Bombardier Flexjet is a fractional aircraft ownership program management company operating under Part 91K and is engaged in fractional aircraft management. Flexjet operates approximately 90 aircraft with over 800 employees supporting the Organization. Flexjet is an "Alliance" member of Jet Solutions L.L.C. which is a 14 CFR Part 135 on-demand air carrier. In 2005, Flexjet received FAA Management Specifications (MSpecs), which authorized the company to operate in accordance with FAR 91 Subpart K.

F. Bombardier Aerospace Training Centers

Bombardier and Learjet maintain flight training centers in Dallas and Montreal providing both initial Type Rating Courses and Recurrent Training Courses. Type Rating Courses provide the knowledge and skills necessary to meet or exceed the performance criteria set by the various regulatory authorities (FAA, JAA, Transport Canada, or ICAO). Depending on experience, a type rating can be accomplished on an initial, transition, or upgrade course. The Recurrent Training Course provides the pilot, currently qualified in a particular crew position, with training to refresh and reinforce the knowledge and skills necessary to meet or exceed performance standards. The pilot demonstrates mastery of the aircraft with the outcome of a procedure, maneuver, or operation never in doubt. [44.2] – **Reviewed by O & T, No comments**

G. HEICO Aerospace: HEICO is the world's largest independent supplier of Federal Aviation Administration (FAA)-approved jet engine and aircraft component replacement parts, other than the original equipment manufacturers (OEMs) and their subcontractors. HEICO has state of the art component repair capabilities as well as distribution and manufacturing operations. HEICO is also a leading manufacturer of certain electronic equipment to the aerospace, defense, medical, telecommunications and electronics industries.

HEICO holds both Part 21 approvals as well as Part 145 Repair Station Certificates and has approximately 2,200 Team Members with annual Gross Revenues of \$580M. [85.1] – **Reviewed by O & T, No comments**

H. From the Aviation Suppliers Association (ASA): Founded in 1993, ASA represents the aviation parts distribution industry, and has become known as an organization that fights for safety in the aviation marketplace.

ASA members purchase aircraft parts from FAA-approved manufacturers, and from other FAA certificate-holders. ASA members regularly obtain maintenance, repair and overhaul on their used parts. ASA members also support air carriers by selling

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aircraft parts to them. In addition, 25% of ASA's membership hold FAA repair station certificates, and a number of them also hold manufacturing and air carrier certificates. Clearly, ASA's membership intersects and is intertwined with the community that would be affected by a SMS rule. [70.1] – **Reviewed by O & T, No comments**

- I. Northern Air Cargo: Northern Air Cargo and Northern Air Maintenance Services: A Part 121 all cargo air carrier and a Part 145 repair station operating in Anchorage, Alaska. NAC operates 3 – B-737-200 Cargo aircraft. Combined, both companies have approximately 300 employees. [73.1] – **Reviewed by O & T, No comments**

## 6.2 Question 2

Has your organization implemented an SMS or components of an SMS based on any of the guidance materials below? Please describe your implementation experience.

- FAA Order VS8000.367, AVSSMS Requirements, Appendix B.
- AC-120-92, Introduction to Safety Management Systems for Air Operators.
- FAA-sponsored regulatory or voluntary programs (e.g., Continuing Analysis and Surveillance Systems (CASS), Internal Evaluation Programs (IEP), Aviation Safety Action Programs (ASAP), etc.).
- Foreign civil aviation authorities' SMS development material (e.g., Transport Canada, Civil Aviation Authority of Singapore (CAAS), Australia Civil Aviation Safety Authority (CASA), U.K. Civil Aviation Authority (CAA)-please specify).

- 6.2.1 From The Transport Workers Union of America, AFL-CIO (TWU): FAA-sponsored regulatory or voluntary programs: Several TWU local organizations are actively pursuing the implementation of a full SMS utilizing FAA Order 8000.367 and Advisory Circular 120-92 for guidance of such programs as CASS, IEP, ASAP, and VDRP. TWU is working collectively with Southwest Airlines to develop a Flight Attendant ASAP Program. This program aims to develop a voluntary reporting system that includes a required Memorandum of Understanding (MOU). The MOU would outline specific parameters between the Federal Aviation Administration (FAA), the airline company, and the labor organization for reporting safety issues. Specifically, the ASAP program would provide Southwest Flight Attendants with the opportunity to report unintentional noncompliance. Any instance of self-reporting protects Flight Attendants from punitive action against them. With the MOU, Flight Attendants form an ERT team which evaluates the ASAP programs, and makes a determination whether such a program is applicable under the MOU, or if not applicable, whether it is because it is outside the parameters, or unintentional. Currently, TWU Flight Attendants are working with Flight Attendants with other airlines and unions to share research and best practices. [47.1] – **Reviewed by O & T, No comments**

- 6.2.2 From the Air Transport Association of America, Inc. (ATA): The majority of ATA carriers have embarked on the FAA SMS Pilot Program outlined by AFS-900 in five phases. Most are progressing from Level 0 (Introduction/Familiarization/Gap analysis) through Level 1 (Planning and Organization) to Level 2 (Reactive Processes). 3

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- A. One carrier has completed Level 3 (Proactive Processes) and Level 4 (Continuous Improvement). Most carriers use:
  - B. FAA Order VS8000.367, AVSSMS Requirements, Appendix B,
  - C. AC-120-92, Introduction to Safety Management Systems for Air Operators, and FAA-sponsored regulatory or voluntary programs (e.g., Continuing Analysis and Surveillance Systems (CASS)<sup>3</sup>, Internal Evaluation Programs (IEP), Aviation Safety Action Programs (ASAP), etc.).
  - D. SMS Pilot Program – SMS Framework (revision 2), Assurance Guide (revision 2), and Implementation Guide<sup>4</sup>.

Some carriers have leveraged foreign civil aviation authority documents<sup>5</sup> in developing language that will guide their employees in achieving a “critical mass” of those who can articulate and put into practice the basic, simple concepts of a repeatable, continuous improvement process.

Some authorities, such as Canada, have “been in the SMS business” for quite some time, and have modified their underlying concepts, regulatory language and guidance to reflect important “lessons learned.” ATA believes that experiential knowledge is helpful to an air carrier/air service provider in tailoring SMS processes to both the company’s organizational and safety culture.

It should be noted here that the majority of ATA air carriers have implemented an array of voluntary safety programs over the past 15 years that are appropriate “building blocks”<sup>6</sup> for SMS:

- Aviation Safety Action Programs (ASAP) based on FAA AC 120-66B, covering Flight, Onboard (“In-flight” or Flight Attendant), Maintenance (Technical Operations), Dispatch, and Stations operations areas
- Flight Operational Quality Assurance (FOQA) based on FAA AC 120-82
- Internal Evaluation Program (IEP) based on FAA AC 120-59A
- Line Operations Safety Audits (LOSA) based on FAA AC 120-90
- Voluntary Disclosure Reporting Program (VDRP) based on FAA AC 00-58B
- Advanced Qualification Program (AQP) based on FAA AC 120-54A
- Continuing Analysis and Surveillance System (CASS) based on FAA AC 120-79
- Aviation Safety Information and Analysis System (ASIAS) – data sharing facilitated by Mitre Corporation

Most air carriers believe they have a fairly good grasp of the concepts of an SMS and how to use it once implemented, but are still developing their implementation plan and working very hard to create the data streams necessary to support a robust SMS. They look forward to the publication of the Guidebook for Developing a Basic Safety



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Management System, and expect that it will provide the additional guidance material necessary to implement SMS. [51.1] – **Reviewed by O & T, No comments**

6.2.3 From the Allied Pilots Association (APA): (2.c.) Yes, APA has been a partner in the implementation of a number of safety programs with American Airlines, to include Flight Operations Quality Assurance (FOQA) and the Aviation Safety Action Program (ASAP). Our experience with the implementation of the Advisory Circular (AC) regarding ASAP is that it has been applied in regulatory manner rather than as “guidance.” Additionally, the regulatory manner of application has been subjectively applied based on one agency employee’s interpretation and views. There needs to be a more objective process for application and approval of any “program MOU” as it relates to an Federal Aviation Administration (FAA) AC. [76.1] – **Reviewed by O & T, No comments**

6.2.4 From the Association of Flight Attendants – CWA (AFA): 2c. AFA has worked with its local union councils to establish flight attendant ASAP memoranda of understanding (MOU) at three different airlines and is currently working on MOU to establish ASAPs at another four airlines. [59.1] – **Reviewed by O & T, No comments**

6.2.5 From the Air Medical Operators Association (AMOA): Respondents utilized all of the aforementioned references above in some form, though the primary guidance is AC 120-92 and Transport Canada materials. The IHST's SMS Toolkit was also included in guidance materials.

AMOA believes that there is significant value to this wide range of documents; however, until two years ago the FAA's guidance was limited, and we believe that has led to delays in widespread, uniform implementation of SMS in the US. Despite this delay, the most current FAA guidance, dated 15 July 2009, is much improved and provides the very uniform implementation tool that the aviation community lacked prior to its release.

AMOA also believes that there are lessons to be learned and applicable Best Safety Practices (BSP's) that are available through other industries and the Department of Defense. [52.1] – **Reviewed by O & T, No comments**

6.2.6 From Delta Airlines, Inc.: Delta Air Lines has implemented a Safety Management System (SMS) for all operating divisions based on the FAA Order VS8000.367, FAA SMS Program office materials, AC 120-92, and the Framework. The guidance materials provided the extensive requirements to implement a comprehensive operational SMS.

As part of the pilot project, Delta Air Lines, Inc implemented the SMS in partnership with the SMS AVS Program Office at D.C (FAA). Our implementation was aided by the efforts of the SMS Focus Group and the senior leadership’s commitment to the long term success of the SMS. [56.1] – **Reviewed by O & T, No comments**

6.2.7 From Virgin America Airlines: Virgin America was certificated in 2007 with SMS organization, policies, procedures, and manuals. We currently have the following FAA-sponsored or voluntary programs:

A. Aviation Safety Action Program (ASAP) for pilots, dispatchers, and aircraft mechanics.

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B. Continuing Analysis and Surveillance Systems (CASS).

C. Flight Operational Quality Assurance (FOQA).

D. Internal Evaluation Program (IEP). [40.1] – **Reviewed by O & T, No comments**

6.2.8 From Ameriflight, LLC: We are in the process of implementing a SMS based generally upon the “SMS Lite” program developed by Regional Air Cargo Carriers Association, which was revised earlier this year to parallel the FAA SMS Framework document and associated ICAO standards. We hope to have the program in place by the end of 2009. The most significant issues we see are training and familiarization with the program for both line and management employees, and insuring that it remains simple enough so it will continue to be utilized properly. [2.1] – **Reviewed by O & T, No comments**

6.2.9 SMS4Aviation, LLC (Formerly Tradewins) provides several options for aviation operators and non-aviation companies. We provide a complete framework utilizing the ICAO/FAA framework-guidelines ASP and the OHSAS/ISO stands for non-aviation operators. That program is designed to be self-implemented and comes with instructions and phone support. Designed primarily for small one to five aircraft operations. We also can provide full implementation of that customized program for operators who are short of personnel or who just want us to do it. Initially, the FAA utilized the OHSAS framework (18001) which we believe is far superior to the ICAO framework based on the decades of experience companies have with that standard. Our experience has largely been working with that standard however when the FAA changed and went with the ICAO standard, we developed and made the necessary changes so aviation operators programs would be readily familiar to regulatory agencies within the ICAO airspace. The standards people we talk with were not overly impressed with the ICAO format and have stated their preference to the OHSAS standard for SMS. [3.1] – **Reviewed by O & T, No comments**

6.2.10 Jet Logistics established an SMS in December 2008. We utilized the Risk Matrix in AC 120-92 as the basis for our Risk Matrix (slight modifications). None of the other listed publications were used. [6.1] – **Reviewed by O & T, No comments**

6.2.11 From Miami Air International: Yes, participant in the SMSPP

A. FAA Order VS8000.367, AVSSMS Requirements, Appendix B.

The International Civil Aviation Organization (ICAO) is a United Nations affiliated organization that is dedicated to increasing the safety and security of international civil aviation. As a member of ICAO, the US has committed to comply with ICAO safety standards. SMS closes the gap between the ICAO safety management requirements and current FAA capabilities. FAA/US has filed a “differences” with the SMS requirement. The ICAO requirement at this point only applies to “states”. FAA order VS8000.367 establishes a common strategy and guidance within the Federal Aviation Administration (FAA) for the implementation of SMS in accordance with ICAO standards. For this reason we have heavily relied on ICAO doc 9859 to get as complete a perspective, understanding, and intended design expectation for SMS.

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B. AC-120-92, Introduction to Safety Management Systems for Air Operators.

Provides the guidance material that we are using in the development of our SMS Manual (SMSM).

C. FAA-sponsored regulatory or voluntary programs (e.g., Continuing Analysis and Surveillance Systems (CASS), Internal Evaluation Programs (IEP), Aviation Safety Action Programs (ASAP), etc.).

We have the following programs established and in place in our organization:

- CASS – AC NO:120-79 - Continuing Analysis and Surveillance System
- ASAP - AC NO:120-66B - Aviation Safety Action Program
- FOQA - AC NO:120-82 - Flight Operational Quality Assurance
- VDRP - AC NO:0058 - Voluntary Disclosure Reporting Program
- IEP - AC NO:120-59A - Air Carrier Internal Evaluation Program
- CRM – AC NO:120-51E - Cockpit Resource Management
- EFB – Electronic Flight Bag – Miami Air was the first airline certified to use a paperless electronic flight bag with worldwide coverage.
- PSC – Professional Standards Committee – Committee reviews all pilot performance with the goal of pilot improvement.
- OPT – Onboard Performance Tool – Pilots can automatically calculate performance weights for maximum efficiency for take-off and landing anywhere the runway permits.
- RAMP – Risk Analysis Management Program – A points system supervised by the Chief Pilot, which derives a risk score (numerical) on operating out of non-standard airports.
- ERP – Emergency Response Plan - This program establishes procedures and notification lists to be used by Flight Control personnel in the event of an emergency involving Miami Air Aircraft.

D. Foreign civil aviation authorities' SMS development material (e.g., Transport Canada, Civil Aviation Authority of Singapore (CAAS), Australia Civil Aviation Safety Authority (CASA), U.K. Civil Aviation Authority (CAA)--please specify).

We have received guidance from the following:

- Transport Canada and Australia Civil Aviation Safety Authority

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•Most helpful has been ICAO Doc 9859 Second Edition. [11.1] – **Reviewed by O & T, No comments**

6.2.12 From Omni Air International: In December of 2003, Omni undertook a complete re-evaluation of its then existing safety programs and manuals and adopted the fundamental principles of safety management systems. Guidance developed and published by the International Civil Aviation Organization, Transport Canada, the Department of the Army, the United States Coast Guard, the Department of Defense Transportation Command, and industry best practices proved valuable resources. Since that date, Omni has continued to develop and refine its safety management system to incorporate additional elements identified in the cited publications, as well as industry best practices. [83.1] – **Reviewed by O & T, No comments**

6.2.13 From Aero Micronesia, Inc. d/b/a Asia Pacific Airlines: The Safety Management System at Asia Pacific Airlines was developed in accordance with the standards and recommended policies and procedures as prescribed in the following documents:

- Annex 6 to the ICAO Rules, Operation of Aircraft
- ICAO Document 9859, ICAO Safety Management Manual (SMM)
- ICAO Document 9734, Safety Oversight Manual
- Advisory Circular (AC) 120-92, Introduction to Safety Management Systems for Air Operators
- Advisory Circular 120-59A
- FAA Order VS 8000.1, Safety Management System Doctrine
- ISO 9000-2000, Quality Management Systems-Fundamentals and Vocabulary
- ISO 9001-2000, Quality Management Systems-Requirements
- AC 120-59A, Air Carrier Internal Evaluation Programs
- AC 120-66, Aviation Safety Analysis Programs (ASAP)
- AC 120-79, Developing and Implementing a Continuing Analysis and Surveillance System
- AC 120-82, Flight Operational Quality Assurance
- Safety Management System Assessment Guide, Transport Canada; Document: TP 14326E (05/2005) [65] – **Reviewed by O & T, No comments**

6.2.14 From Chantilly Air, Inc.: Chantilly Air, Inc. has developed a complete SMS based on the requirements in AC 120-92, Introduction to Safety Management Systems for Air

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Operators, and ICAO Document 9859, Safety Management Manual. We are also actively pursuing participation in the Aviation Safety Action Program (ASAP).

Chantilly Air, Inc. created a part-time Safety Coordinator position to coordinate SMS development. Development was facilitated by the use of materials and assistance from industry associations (NATA, IBAC).

In our experience, a dedicated safety position is necessary for an operation of Chantilly Air's size. We also believe that development assistance that goes beyond the high-level overview provided in AC 120-92 is critical to assist operators in the development of an SMS. [81.1] – **Reviewed by O & T, No comments**

6.2.15 From Frontier Alaska: The Part 121 air carriers, Era Aviation and Frontier Flying Service have implemented components of SMS, see below regarding specific guidance materials.

2a Not applicable.

2b The SMS components currently in place at Era Aviation and Frontier Flying Service meet or exceed the requirements listed in the AC 120-92, with a few exceptions. Currently in place includes, a written safety policy, safety planning, organizational structure & Responsibilities, compliance, risk management, hazard identification, Internal Evaluations and Audits, Investigations, preventative & corrective actions, safety promotion, and safety training. Components which are either not in place or not fully developed include, safety lessoned learned, management reviews of SMS outputs, external auditing of SMS, and a written process for documenting the management of change and other SMS recordkeeping requirements.

2c Era Aviation and Frontier Flying Service have robust, mature CASS and IEP programs already in place which were implemented in accordance with 121 regulations for CASS and AC 120-59A for IEP. All three certificate holders under the Frontier Alaska group participate in the ASAP program with the Medallion Foundation as the programs facilitator

2d Not applicable. – **Reviewed by O & T, No comments**

6.2.16 Other Comments

A. From Bombardier Aerospace: At Bombardier Aerospace we have started implementing SMS in several areas of our business with a goal of integrating all these safety activities within one integrated Safety Management System company wide. Below you will find a summary of the status of our deployment:

<b>Functional Unit/Area</b>	<b>Status</b>	<b>Guidance material used</b>
Canadian AMOs	TCCA SMS Phase IV - complete	(d) TCCA guidance, TP14343, CAR573, CAR107
Canadian Flight Ops & Wichita Flight Test Ops	CBAA approved	(d) TCCA and CBAA guidance materials
Flexjet US	NATA Safety First Program – level 2	(b), FAA guidebook, ASAP
Tucson BSC	FAA Pilot Project (in-progress)	(a), (b), (d) ICAO doc 9859
W. Virginia BSC	FAA Pilot Project (in-progress)	
Downsview Airport	TCCA SMS Phase I - complete	(d) TCCA guidance materials
Demo Flight Ops Group	I S-BAO evaluation (in-progress)	(b), (d) TCCA and IBAC guidance materials (IS-BAO tool kit)

#### B. Maintenance & Service Centers Experience Implementing SMS

The Tucson Regional Aircraft Service Center (BSC) is currently working toward completion of the first phase of SMS implementation, including the creation of an improved Safety Policy, Safety Reporting and Safety Commitment letters, identifying accountability and key personnel, performing a gap analysis and identifying action plans. They are utilizing AC-120-92 and referencing ICAO Doc 9859 Safety Management Manual (SMM), FAA Policy VS 8000.367 and information presented by operators during focal team meetings. It has been their initial experience that the guidance material available today is somewhat ambiguous as to what is expected in order to meet the intent of some of the SMS requirements. The scope of SMS regulations and how those regulations will interact with the current requirements of the service center's maintenance manual are not entirely clear. Another issue that needs attention is how SMS guidance and interpretation will be coordinated. within the FAA so as to promote consistency in application of the regulations.

Bombardier's Canadian Approved Maintenance Organizations (AMOs) utilized Transport Canada Implementation Guidance materials for development and deployment of SMS. The documents that proved most useful were the following:

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TP14343 and as per Canadian Aviation Regulations 573.30/573.31/573.32 and 107.3. Development of SMS within Bombardier's Canadian AMOs began in 2005 and has been phased in over a four year time period in accordance with Transport Canada guidelines.

#### C. Flight Operations Experience Implementing SMS

Bombardier Flight Operations departments in Canada implemented a fully compliant SMS in 2008. This SMS was based on guidance material from Transport Canada and the Canadian Business Aviation Association (CBAA). From a SMS perspective, these Flight Operations departments are organized under a single Accountable Executive and managed by a Safety Committee. The Flight Operations SMS has already completed two successful audits. The introduction of the Flight Operations SMS was simplified by adopting the documentation, processes and tools from an already SMS compliant airline. The SMS was then customized for Bombardier's Flight Operations departments in Canada and at the Bombardier Aerospace Flight Test Center in Wichita, Kansas. While establishing the documentation and processes was relatively simple, training and implementation was more difficult. Furthermore, very complex accident/incident/hazard identification and tracking systems are required to meet all of the SMS requirements mandated by Transport Canada and the CBAA. The collection of material for the databases should be implemented in the U.S. in a way that protects companies' confidential information

The Demonstration and Flight Operations supporting Bombardier's Sales Team have begun implementation of SMS. They are using FAA AC 120-92 and Transport Canada publications as well as International Business Aviation Council ("IBAC") documents. These documents are generally helpful. However specifics related to business flight operations are sketchy, especially details and guidance on how to implement specific elements such as, gathering statistical data and establishing risks and probabilities.

As a member of the National Air Transport Association (NATA) the Flexjet organization subscribes to the NATA Safety First program which is a guide to SMS development and implementation. The guide is developed in accordance with AC-120-92 and the supporting FAA document "Guidebook for Developing a Basic Safety Management System (SMS) for Air Carriers." Flexjet utilized this program as its primary reference and guidance material to begin development and implementation of its SMS. Flexjet implemented the Aviation Safety Action Program in July 2007 as a vehicle for flight crewmembers to voluntarily report safety information that might be critical in identifying potential precursors to accidents. With the implementation of ASAP Flexjet safety reporting has improved significantly and the ASAP is now the primary reporting tool and source of data collection for safety analysis and corrective action process.

#### D. General Experience Implementing SMS

- 1) Based on the Flight Operations SMS experience there could be some benefit to having some pre-existing SMS models or lessons learned available in the Flight Operations sector of the industry to facilitate implementation.

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- 2) Senior management support is essential through all phases of development and deployment of SMS.
  - 3) Pilot project experience with the FAA has uncovered potential problems with lack of consistency between the FSDO and FAA SMS administrator on interpretations and expectations for SMS deployment that has led to conflicting and shifting direction with respect to implementation. [44.2] **Reviewed by O & T, No comments**

E. HEICO Aerospace: 2a. HEICO Policy 103-0 Continued Operational Safety (COS) System Requirement covers approximately 85% of the requirements noted in VS8000.367 Appendix B.

2b. HEICO Policy 103-0 Continued Operational Safety (COS) System Requirement covers approximately 85% of the requirements noted in AC-120-92. [85.1] – **Reviewed by O & T, No comments**

F. From the Aviation Suppliers Association (ASA): Many ASA members have implemented quality assurance systems that meet many of the requirements of an SMS program. This has been accomplished voluntarily by the distribution industry as part of the Voluntary Industry Distributor Accreditation Program (VIDAP).

The Voluntary Industry Distributor Accreditation Program (VIDAP), was published by the FAA in Advisory Circular 00-56 in September 1996. The FAA set basic quality standards that they expected every accredited distributor to meet, and they chose several sets of industry standards (e.g. ASA-100 and ISO 9000) to supplement those quality standards. In order to become accredited, a distributor must meet both the standards established in AC 00-56 and also the additional standards set in the industry standard. This variety of supplemental industry standards permits companies to establish a Distributor Accreditation System that meets the individual needs of the company while still supporting the safety performance goals published in the FAA and industry standards. [70.1] – **Reviewed by O & T, No comments**

G. Northern Air Cargo: Portions of SMS have been implemented. Hazard Reporting and Risk Assessments are key to our overall safety program.

2b. Little help.

2c. We are involved with CASS, ASAP, and IEP for NAC. [73.1] – **Reviewed by O & T, No comments**

### 6.3 Question 3

Please comment on the sufficiency of the following SMS guidance material, and what, if any, additional information you would need to implement an SMS.

- a. FAA Order 8000.367, AVSSMS Requirements, Appendix B.
- b. AC-120-92, Introduction to Safety Management Systems for Air Operators.



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- c. Foreign civil aviation authorities' SMS development material.
  - d. Third party material (e.g., IATA Operational Safety Audit (IOSA), International Standard for Business Aircraft Operations (IS-BAO), Regional Air Cargo Carriers Association (RACCA), Air Cargo Safety Foundation (ACSF)).
  - e. Other (please specify)

- 6.3.1 From the Air Transport Association of America, Inc. (ATA): In general, the guidance material generated by the FAA can be deemed "satisfactory." It is fine as far as it goes, which is a light coverage of SMS "structure and concepts."

Under the current scheme, several layers of documents are required for air carriers to understand, analyze, and implement SMS. FAA Order 8000.367 is a good baseline document for carriers, but it is very preliminary in nature. The SMS Framework document provides a basic conceptual structure, but additional specific fundamentals and detailed guidance material directed toward a Part 121 aviation service provider/airline is needed. The SMS Assurance Guide and SMS Gap Analysis Tool provide much of the needed additional tools to assess the design and performance of elements of an air carrier's SMS, and to explain the elements for building a Safety Management System.

Advisory Circular 120-92 provides some good conceptual information, but remains overly fundamental. During the familiarization phase, the ICAO Safety Management Manual and SMS Assurance Guide have become the resources of choice. The recent changes to the IOSA ICAO Standards and Recommended Practices addressing SMS are welcome additions, but they do not appear to include all of the elements needed to conform to the current guidance in the United States.

Guidance material should yield specific examples or explanations of SMS elements that meet the individual requirements of a Safety Management System. The upcoming Guidebook for Developing a Basic Safety Management System should provide the guidance resources needed; however, this document is still under development. Additionally, while the principles behind Safety Management Systems are sound and relatively straight forward, the cumulative guidance material available thus far seems to complicate the concepts, instead of clarifying them. As a result, it appears that some air carriers are applying significant resources to decipher the content, complicating safety program addenda as carriers attempt to conform to unclear SMS objectives.

Each air carrier must adapt the basic guidance in order to implement a workable set of goals, processes, and standard operating procedures to address the four major facets of SMS: (1) identifying hazards in the workplace, (2) conducting a risk assessment of the hazards, (3) defining a range of mitigation strategies and selecting those deemed cost/ effective, and (4) continuously measuring the effectiveness of these strategies. Many ATA carriers are borrowing from the available literature on successful SMS endeavors (applicable both inside and outside the aviation industry) for implementation strategies that will work and become embedded in the corporate culture. This is, in effect, a "journey" vs. a means to an end. SMSs should have a certain flexibility to adapt to change within the industry as new technologies, business alliances, and safety issues arise.

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It is sometimes difficult to know what has changed when revisions have been issued. The revision process for the Detailed Gap Analysis and other documents created some confusion and duplicate work at times. A suggestion is to indicate what changes have been made on newer versions so that an operator can quickly identify what elements are different.

Another suggestion is to be more forthcoming with information on what Pilot Project participants have experienced within the program. It would also be helpful to highlight the potential for more operators to be a part of the Pilot Project, if they desire. The challenges/success of other Part 121 operators as they move toward SMS could be very useful, and sharing information may prevent the same mistakes from being made repetitively.

An important advantage for air carriers is the ability to participate in the FAA Academy SMS training that the Certificate Management Offices are being offered as they transition to SMS. As Pilot Project CMO participants are being scheduled for this SMS training, it would only make sense for both an air carrier's and its associated CMO's personnel to train together to gain a better understanding of the process moving forward.

Potential rulemaking and associated guidance (including Inspector Guidance) must allow flexibility for Part 121 aviation service provider/airlines to apply the best possible fit to their organizations. Not all programs can, or should, be identical and may differ due to the type of operation. Of concern for the future is whether or not FAA will actually approve what has been accomplished and is in place, whether there will be flexibility in having an SMS that suits each company's existing culture and management practices, or whether FAA will be rigid and prescriptive in rulemaking. There are many ways to create the required safety culture and commitments needed for the future, but each company must have room to tailor the approach in a way that suits them. At the same time, the industry needs guidance regarding how the FAA plans to measure SMS effectiveness in the future. It's difficult to make determinations on what an organization needs when its leaders do not know what precisely the regulator will be assessing. [51.1]

A. Operations and Training Comments:

- 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - a) Yes, it is valid to the SMS rule
- 2) Is it valid to the discussion? Yes or no
  - a) Yes, it is valid to the discussion
- 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
  - a) Yes, the need to bring all the SMS guidance material up to date. To develop cumulative guidance material reducing the complicated concepts and clarifies the guidance
  - b) Other: Revision to determine what should be included in the guidance and what should be included in the regulation.

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4) Is it a scope related comment? Yes or no

a) Yes, flexibility in having an SMS that suits each company's existing culture.

6.3.2 From Air Line Pilots Association, International (ALPA): FAA Advisory Circular 120-92, Introduction to Safety Management Systems for Air Operators, contains the concepts of SMS and guidance for development by aviation service providers. The guidance is generally adequate but could be strengthened and made more complete from lessons learned through the FAA's SMS implementation pilot project.

We feel there is one particular area that needs to be strengthened in the AC; the requirement for an accountable executive. The AC addresses a systems approach to safety management and discusses the importance of executive management involvement. The AC fails, however, to further specifically identify top management. ALPA strongly believes that the chief executive officer (CEO) of an organization should be named as the executive responsible for the SMS effort at that organization. It is easy to say that "safety is everyone's business" but there must be one person at the highest level of the organization who is actually responsible and accountable for the SMS. At the very least this sends a strong message to those responsible for the "day to day" activities that the SMS effort is sincere and will be supported and at best it eliminates the troublesome disconnection between the safety message and the safety behavior. One can argue that the organization's budget allowances are one example where other organizational goals often get attention at the expense of safety. When an executive officer is made accountable for the safety product of the organization, he or she would be expected to determine and achieve the appropriate goals.

The identified accountable executive must enforce the organization's commitment to continuous improvement in the level of safety, management of risk, and promotion of a strong safety culture. There must be clearly defined and documented lines of responsibility and accountability from the executive throughout the organization to promote SMS. This guidance should extend to a safety policy letter signed by the accountable executive. This will provide clear delineation of responsibilities throughout the organization for implementation of an SMS.

The ICAO Safety Management Manual (Doc 9859, AN/474) discusses management responsibility and authority in great detail and specifically discusses the role and responsibilities of the "Accountable Executive." Transport Canada SMS guidance also discusses the role of the accountable executive. FAA guidance should provide specific guidance along these lines.

The AC briefly addresses the issue of an organization's safety culture. An organization's safety culture can be both an indicator of the safety awareness of an organization and its ability to improve. Within the AC there is little guidance on how an organization can benefit from the creation of a safety culture. Additionally, a non-punitive voluntary safety reporting program, such as the Aviation Safety Action Program (ASAP), should be a required element of an SMS. Such a reporting program will strengthen a safety culture and all employees will perceive a direct interest and benefit in improving safety. [69.1]

A. Operations and Training Comments:

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- 1) ALPA strongly believes that the chief executive officer (CEO) of an organization should be named as the executive responsible for the SMS effort at that organization.
  - 2) The group concurs fully with the commenting party's assertion.
  - 3) The identified accountable executive must enforce the organization's commitment to continuous improvement in the level of safety, management of risk, and promotion of a strong safety culture. There must be clearly defined and documented lines of responsibility and accountability from the executive throughout the organization to promote SMS. This guidance should extend to a safety policy letter signed by the accountable executive. This will provide clear delineation of responsibilities throughout the organization for implementation of an SMS.
  - 4) The Senior Executive Officer should demonstrate leadership through participation and enforcement of the SMS policy.
  - 5) Concur with comment with addition of a Management Policy letter that assigns responsibility for the execution of said policy to an accountable senior executive of the organization.
  - 6) Within the AC there is little guidance on how an organization can benefit from the creation of a safety culture.
  - 7) The group concurs with the commenting party's assertion and feels it would be best suited for the AC and final rule preamble to include more specific guidance regarding, the need for and benefits of, a robust safety culture which is captured in the fourth pillar of the SMS construct.

6.3.3 From the Allied Pilots Association (APA): (3.a.) APA believes that the SMS Advisory Circular, AC 120-92, is a good document overall. We see some room for improvement in select areas. One of note is in Appendix 1, paragraph 7.4, Training. We believe it is important to stipulate that all responsible managers receive specific SMS training. The existing wording could be misinterpreted to suggest only employees not inclusive of management to include top-level officers of an air carrier should receive SMS training. Further, if top-level managers have no training in SMS, they could not be expected to understand and support, in a manner commensurate with the suggested rule, the implementation of SMS. [76.1]

A. Operations and Training Comments:

- 1) Agree with comment. Need to identify specifically which positions/ responsibilities/titles would be covered. Accountable executive/manager (Transport Canada flow chart). 4.5a needs to define top management (ISO-9000). Sarbanes/Oxley-like responsibility. ICAO SMS Manual 8.4.5/8.4.6. Definitions should remain in guidance material.
- 2) 3.7 Who is the accountable executive?

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- 3) The accountable executive is, for all intents and purposes, the certificate holder. In fact, in a sole proprietorship he or she will almost certainly be the certificate holder.
  - 4) In a corporation, he or she will most likely be the CEO or a senior executive who has been delegated authority similar to that of the CEO. This is not just a manager with a big budget. It is someone at a level that determines how big the various departmental budgets will be, with full executive control over the organization's activities. In an airport environment where the owner is the local council, the accountable executive will most likely be the mayor.
  - 5) The reason for specifying a single accountable executive for all certificates held is to ensure that this responsibility is not simply delegated to the various functional heads responsible for the different certificates. After all, as the individual responsible for the SMS, this person will have to decide whether, for example, to divert funds from new aircraft acquisition to new hangar construction, or from training to test equipment.
  - 6) The implementation of the accountable executive will ensure that:
    - a) Senior management cannot avoid responsibility for systemic failures due to ignorance;
    - b) All major safety-related findings are known by the accountable executive; and
    - c) The accountable executive is held responsible for safety deficiencies.

6.3.4 From the Association of Flight Attendants – CWA (AFA): 3b. The general philosophy of AC-120-92 with respect to the role of line employees is that they are little more than a reporting mechanism for the safety system. This is insufficient; line employees must also have input to safety program design and decision-making. ASAP is a good example of a “collaborative, reporting, analysis, and problem solving effort among the FAA, operators, and employee unions.” [AC 120-92, page 20] The philosophies of this “three-legged stool” in ASAP should be integrated into all aspects and implementations of SMS to support and enhance safety assurance and safety promotion. The AC-120-92 guidance document as currently written does not fully support the concept of a complete partnership between management, authorized line employee representatives and regulators. Throughout the document when line employees are mentioned they are referenced as a group that will receive information or will be reporting to the operator. All employee group representatives must be included in the decision making process. [59.1]

A. Operations and Training Comments:

- 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - a) Yes.
- 2) Is it valid to the discussion? Yes or no
  - a) Yes.

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- 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
    - a) Yes.
    - b) The entire organization needs to understand the SMS concept and objectives.
    - c) Needs management/leadership/employee participation
  - 4) Is it a scope related comment? Yes or no
    - a) Yes.

6.3.5 From the Air Medical Operators Association (AMOA): AC 120-92 was a valuable document, but as a standalone product it lacked the ability to fully explain and implement an SMS. By combining AC 120-92, the Draft AC on Voluntary Implementation of an SMS, and Quality Management aspects of IHST's SMS Toolkit, we were able to fully understand the processes, implement and evaluate the program from the FAA's perspective. The checklist in the draft AC was especially valuable, as it appears to be the tool the FAA will use to measure implementation. AMOA recommends combining documents wherever possible as to ensure the philosophy and explanations exist along with an implementation checklist. SMS as explained is too theoretical in nature and the documents require real world examples of proven tools and formats for implementation. Further, SMS documentation must be easily understood and useable by every employee and participant in the organization and its mission. As mentioned previously, other industries and the DoD possess proven tools and examples of SMS elements and components that may be easily modified to meet the needs of our industry. [52.1]

A. Operations and Training Comments:

- 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - a) Yes, it is valid to the SMS rule
- 2) Is it valid to the discussion? Yes or no
  - a) No it is not valid to the discussion
- 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
  - a) No
- 4) Is it a scope related comment? Yes or no
  - a) No

6.3.6 From Delta Airlines, Inc.: Conceptually, the SMS guidance material provided is sufficient for any organization to develop and implement an SMS, however the guidance and the supporting materials are too complicated and voluminous. Due to Delta's involvement in the pilot program and the active participation at the SMS Focus Group, we are skeptical if we would have evolved and advanced to the same extent without the AVS program office guidance. [56.1]

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A. Operations and Training Comments:

Concur with commenting party in that final guidance should be as systematic and succinct as possible.

- 6.3.7 From Virgin America Airlines: We used applicable FAA guidance material and foreign civil aviation authorities' development material in the creation and enhancement of our Company's SMS manual. We completed an IATA Operational Safety Audit (IOSA) in September 2009 to help validate our SMS compliance. [40.1]

A. Operations and Training Comments:

Nice to know. However, an IOSA audit does not validate SMS compliance.

- 6.3.8 From Ameriflight, LLC: The most useful material from the FAA was the "Framework" document; we are also making extensive use of the Regional Air Cargo Carriers Association "SMS Lite" boilerplate document, developed by the RACCA Safety Committee more than two years ago and revised earlier this year to bring it into line with "Framework" and ICAO guidance. The guidance material needs to be condensed and simplified; it is far too voluminous and complex to expect a small operator to digest it. [2.1]

A. Operations and Training Comments:

- 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - a) Yes.
- 2) Is it valid to the discussion? Yes or no
  - i) Yes.
- 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
  - a) Yes.
  - b) There needs to be sufficient guidance that SMS implementation can be understood for any size organization.
- 4) Is it a scope related comment? Yes or no
  - a) Yes.

- 6.3.9 From SMS4Aviation, LLC: The FAA's AC 120-92 is the better document in our opinion in terms of consistency and relevance. The ORDER 8000.367 was not as helpful. The ICAO's doc 9859 was helpful in terms of flight safety background information, we believe that it was not organized very well and should have been divided up a bit differently. We often receive phone calls from operators trying to find out what exactly the ICAO means in certain passages, generally chapter 6 has confused flight operators with regard to SMS acceptance. [3.1]

A. Operations and Training Comments:

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- 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
    - a) No
  - 2) Is it valid to the discussion? Yes or no
    - a) No
  - 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
    - a) No
  - 4) Is it a scope related comment? Yes or no
    - a) No

6.3.10 From Jet Logistics, Inc.:

a. FAA Order 8000.367	not used
b. AC 120-92	reasonably good publication. Needs more examples, i.e., sample Safety Policy, hazard report forms, etc.
c. Foreign civil aviation SMS	none used
d. IS-BAO	This was the basis for our SMS program. It was a little disjointed also, with some duplication and sparse direction in some areas, but was head and shoulders above any thing else out there. More concise and less abstract than the ICAO SM Manual (Doc 9859)
e. other	None

A. Operations and Training Comments:

The group has no specific assertion the commenting party.

6.3.11 From Miami Air International: I do not believe that this program can succeed without the establishment of proper regulatory oversight. Provision of SMS funding at the local level, arranging for local FAA inspectors to travel to SMSPP meetings so they can work hand in hand with the Service Providers and help in the development of the program, these FAA inspectors will acquire essential specialized skills that will later be required to ensure that a balance is maintained between the protection and profit side of the Service Providers SMS program. [11.1]

A. Operations and Training Comments:

Requiring FAA to oversee/investigate the “business” side of the operation is beyond the scope of SMS. Agree that inspectors will need training on SMS. FAA and industry should both be in the same room for training. Have FAA inspectors



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participate in the company training conducted by operators. Should not expect FAA to assist in the development of the company SMS. However, FAA does need to provide sufficient guidance material for the operator to use in developing the operator's program.

- 6.3.12 From the Regional Airline Association: Present SMS guidance such as Advisory Circular 120-92 is very broad and left unchanged would accommodate a variety of approaches for implementing SMS within an airline's organization; AC 120-92 was prepared to accommodate a variety of operators, not just Part 121 operators. We would expect that this AC would be re-worked so that it would accommodate smaller Part 135 and 121 operators as well as the larger Part 121 operators. SMS must be scalable.

As guidance for the FAA inspectors, the SMS focus group has offered a detailed Gap Analysis Tool which is based upon the FAA's oversight program (ATOS). The FAA has repeatedly told industry that ATOS is simply their oversight tool for assessing risk and that strict adherence by the operator is not a requirement. However without further guidance, it is clear that this tool will be used by FAA inspectors in approving an operator's SMS program and unless otherwise advised, it will become very difficult to persuade these inspectors that ATOS is not mandatory as well. ATOS has several fine attributes but overall it is an extremely labor intensive audit that can result in a subjective assessment by the individual auditor of an operator's capabilities.

ICAO Manual 9859, the Safety Management Manual also contains a gap analysis tool. Compared to the SMS Focus Group's Gap Analysis Tool, it is a fairly straightforward audit because it focuses only on finding the essential elements of SMS. The ICAO gap analysis tool should be considered as a reference document for developing an acceptable process for approving an operator's SMS program.

The FAA guidance material needs to elaborate on risk assessment techniques. Both the airlines and the AFS need to understand risk using the same methodology for risk assessment. Field inspectors are presently trained to implement the ATOS "system safety" concepts for assessing risk. We do not consider the "system safety" process as totally compatible with SMS risk assessment techniques since ATOS system safety is directed at regulatory compliance rather than risk. ATOS system safety attributes (responsibility, authority, procedures, controls, interfaces, and process) place a heavy emphasis on an air carrier's organizational accountability and company manual content; such attributes do not necessarily lead to safety risk factors. We understand that the AFS-900 division is in the process of making ATOS system safety more compatible with SMS concepts and look forward to their changes. [22.1]

A. Operations and Training Comments:

- 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - a) Yes.
- 2) Is it valid to the discussion? Yes or no
  - a) Yes.

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- 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
    - a) Yes.
    - b) --Concur with the comment that the Gap Analysis Tool from ICAO Doc 9859 should be used in lieu of the current ATOS gap analysis. The ICAO tool is more user-friendly.
  - 4) Is it a scope related comment? Yes or no
    - a) Yes.

6.3.13 From the Aviation Safety Council of Alaska (ASCA): Currently, there are broad sources of materials available to operators which are aimed at defining SMS standards. Many of these sources are similar in content and, when taken in whole, operators may gain a better understanding of SMS elements. Unfortunately, there does not seem to be sufficient materials available to assist operators in implementing SMS within their organizations.

3.a. Not applicable.

3.b. This guidance material, provided by the FAA, has mixed benefit and its sufficiency can be argued. On one hand, the circular provides an SMS overview, which is positive. On the other hand, sections of the circular seem to be academic in nature and written at a level which new entrants to SMS likely will not understand. The fact that the functional requirements in Appendix 1 are aligned with the ISO 14001 standard is positive. The framework of the functional requirements are also formatted similar to the Code of Federal Regulations and may be considered a framework in writing SMS regulation. The framework is lacking robust continual improvement elements found in Quality Management Systems and the ANSI Z10-2005 Occupational Health and Management Systems Standard. The 120-92 Advisory Circular contains limited language regarding continual improvement; yet continual improvement is core to any quality management system which SMS is based in. One significant problem SMS entrants face is associated with the lack of relative examples. The Advisory Circular does not provide real-world examples of how an operator would apply SMS.

3.c. There are several different development materials available from foreign civil aviation authorities. Most of these materials are very similar in nature. The value of the materials is gained when they are taken in whole and compared with each.

UK Safety Regulation Group CAP 712 Safety Management System for Commercial Air Transport Operators. This document provides a sufficient high-level overview of SMS. Of particular help are Appendix A – Hazard Identification and Risk Assessment Log which provides operators and example of how they might document the Hazard Identification and Risk Assessment process. The first template provides a sufficient example which operators may modify and use as appropriate within their organization. The second example demonstrates that there are various methodologies to achieve similar results.

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Appendix G, Guidance for Operating a Formal Safety Management System. This may be useful for operators in conducting an SMS gap analysis. These types of tools are needed and important for SMS development.

UK Safety Regulation Group Safety Management Systems – Guidance to Organizations. Although this document is labeled a guidance document, it does not provide operators with guidance provided beyond ICAO Document 9859 – Safety Management Manual. In fact, the document’s introduction section encourages operators to use the

ICAO Safety Management Manual. ICAO uses this as their principal source of guidance on SMS. The document provides neither a guide nor a standard. The document consists of outlined bullet items listing processes common to SMS which can be easily gleaned from other documentation.

Transport Canada TP 13739 Introduction to Safety Management Systems. This document is designed to be an introduction to SMS and does not provide a specific standard. This document also provides a general high-level overview of SMS and provides some real-world examples which many operators may find helpful.

Transport Canada TP13881E Safety Management Systems, A Guide to Implementation. This document is one of the more helpful development materials for operators. The document is appropriately titled a ‘guide’, but it does not provide examples for operators to learn from or tools for operators to modify and use.

Transport Canada TP13844 Score Your Safety Culture. These types of tools are valuable to operators as they develop and implement their SMS. Operators can use the checklist developed by James Reason.

Transport Canada TP14326E Safety Management System Assessment Guide This material provides a good tool which operators can use to evaluate their SMS. The document would prove useful for many operators during all phases of SMS implementation. The assessment guide is a good example of tools operators need to assist in SMS development.

3.d. There are some good third party materials available to the industry. Much like regulating authorities’ SMS development materials, the third party materials are most useful when taken in whole. Operators are able to borrow ideas and concepts from many of these materials and develop relevant SMS programs for their organizations.

IATA Operational Safety Audit (IOSA). The IOSA program provides an excellent resource for all operators, but may prove more beneficial to the medium and large operators. The IOSA checklist can be ‘reverse-engineered’ and used as a source to conduct proactive risk analysis based on the operator’s systems. The checklists are also valuable in developing an operator’s Internal Evaluation Program to evaluate safety controls.

IS-BAO. IS-BAO provides some good development tools. The IS-BAO standard places more emphasis on an Operational Risk Profile than any other standard. The SMS Toolkit provided by IBAC, for a fee, provides materials which are sufficient for only the smallest

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operators, such as small corporate-fleet operators. The IS-BAO certification process has proven effective in motivating many corporate flight departments to seek the certification partly due to the competition among corporate flight departments for the certification, but also due to the fact that the certification in many ways sets the standard for SMS in the Part 91 corporate flight industry.

Regional Air Cargo Carriers Association. RACCA provides SMS Lite as a boilerplate SMS template. The template may be sufficient for the smaller operators, but would be insufficient for mid to large-sized operators. The boilerplate is also lacking any description of system assessment, system analysis (design), or data acquisition and analysis. Noticeably missing is the requirement for the operator to develop an Operational Risk Registry and manage risks based on the operator's system design. The RACCA SMS Lite template is also noticeably deficient in defining an operator's emergency response plan, a key element of SMS.

3.e. International Helicopter Safety Team (IHST). The International Helicopter Safety Team has produced a sufficient SMS manual template to get the smallest operators working toward SMS. The IHST SMS Tool Kit is perhaps the most useful single source for the smallest fixed- and rotor-wing organizations. Also included are checklists, forms, and sample performance measures.

Medallion Foundation. The Medallion Foundation Five-Star Program contains many elements of SMS. The five 'stars' of the program; Safety Program, CFIT, Operational Control, Maintenance/Ground Services; and Internal Audit, can be tied into an operator's SMS program. The Medallion Foundation has been working on integrating SMS into the five-star program.

ICAO. ICAO has produced the Safety Management Manual which is the most comprehensive non-commercial SMS implementation material available. The manual provides the ICAO SMS standard, but also details SMS processes and provides example policy and tools. The manual is especially helpful for the largest operators. [71.1]

#### A. Operations and Training Comments:

- 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - a) Yes, it is valid to the rule
- 2) Is it valid to the discussion? Yes or no
  - a) Yes, it is valid to the discussion
- 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
  - a) What's good and what's not good in the guidance.
- 4) Is it a scope related comment? Yes or no
  - a) Yes, Scalability for a smaller organizations and different operators.  
Operators may modify and use as appropriate within their organizations.

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6.3.14 From Omni Air International: On the whole, we have found that the non-U.S. publications (government published and those published by "third parties") provide a higher level of guidance and flexibility in the development and implementation of safety management systems. While the information published by the United States Federal Aviation Administration is useful, it more closely approaches a one-size-all approach to development and implementation in an industry that is widely diverse. In addition to the material cited in item number three of the requested information, we have found other publications, such as United States Department of the Army Pamphlet 385-16 System Safety Management Guide, and the United States Coast Guard Safety Management System Manual Guidebook to be useful additions to the resources we've used in developing and refining our safety management system. [83.1]

A. Operations and Training Comments:

The group concurs with commenting party's assertion in that the FAA review and consider alternate sources of information to craft AC revision.

6.3.15 From Aero Micronesia, Inc. d/b/a Asia Pacific Airlines: We found the availability of the guidance we used to develop our SMS to be excellent. The material from Transport Canada was particularly useful as their SMS initiative appears to be well advanced. [65]

A. Operations and Training Comments:

Nice to know.

6.3.16 From Chantilly Air, Inc.: While it is probable that development of an SMS is feasible based solely on material in AC 120-92, it has been our experience that the material in AC 120-92 is insufficient in depth and concrete practical applicability to allow for widespread implementation.

In order to simplify implementation of an SMS, we found helpful the following materials and assistance:

a. National Air Transportation Association (NATA) Safety First SMS (now Air Charter Safety Foundation, ACSF). The standard involves in-depth training and sample materials for various aspects of a safety management system (for instance, safety reporting program).

b. International Business Aviation Council (IBAC) International Standard for Business Aircraft Operations (IS-BAO). The standard involves in-person training, a prototypical operations manual, a well-developed SMS toolkit, and an Acceptable Means of Compliance for each aspect of the standard.

In particular, in our experience the guidance material developed by IBAC in the IS-BAO standard is aimed at giving concrete help for SMS development. Off-the-shelf development of an SMS using either the IS-BAO or the ACSF standard is relatively straightforward, in particular considering the high level of concrete guidance associated with those standards.

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Many operators do not have the resources to create a dedicated safety position in their organization. Especially for those operators, concrete help – rather than the high-level guidance in AC 120-92 – is needed. To get a sense of the necessary outreach, Chantilly Air, Inc. urges FAA to look to the education effort deployed by Transport Canada in its implementation of the Canadian SMS rule. Chantilly Air, Inc. also urges FAA to consider the excellent third party material that already exists, and which provides concrete implementation guidance. [81.1]

A. Operations and Training Comments:

- 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - a) Yes.
- 2) Is it valid to the discussion? Yes or no
  - a) Yes.
- 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
  - a) Yes.
  - b) --Concur with comments regarding the need to consider third-party guidance material to assist in SMS development and implementation.
  - c) --The FAA should also consider SMS guidance produced by other countries.
- 4) Is it a scope related comment? Yes or no
  - a) Yes

6.3.17 From Frontier Alaska: Currently, there are broad sources of materials available to operators which are aimed at defining SMS standards. Many of these sources are similar in content and, when taken in whole, operators may gain a better understanding of SMS elements. Unfortunately, there does not seem to be sufficient materials available to assist operators in implementing SMS within their organizations.

3.a. Not applicable.

3.b. This guidance material, provided by the FAA, has mixed benefit and its sufficiency can be argued. On one hand, the circular provides an SMS overview, which is positive. On the other hand, sections of the circular seem to be academic in nature and written at a level which new entrants to SMS likely will not understand. The fact that the functional requirements in Appendix 1 are aligned with the ISO 14001 standard is positive. The framework of the functional requirements are also formatted similar to the Code of Federal Regulations and may be considered a framework in writing SMS regulation. The framework is lacking robust continual improvement elements found in Quality Management Systems and the ANSI Z10-2005 Occupational Health and Management Systems Standard. The 120-92 Advisory Circular contains limited language regarding continual improvement; yet continual improvement is core to any quality management system which SMS is based in. One significant problem SMS entrants face is associated

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with the lack of relative examples. The Advisory Circular does not provide real-world examples of how an operator would apply SMS.

3.c. There are several different development materials available from foreign civil aviation authorities. Most of these materials are very similar in nature. The value of the materials is gained when they are taken in whole and compared with each.

UK Safety Regulation Group CAP 712 Safety Management System for Commercial Air Transport Operators. This document provides a sufficient high-level overview of SMS. Of particular help are Appendix A – Hazard Identification and Risk Assessment Log which provides operators and example of how they might document the Hazard Identification and Risk Assessment process. The first template provides a sufficient example which operators may modify and use as appropriate within their organization. The second example demonstrates that there are various methodologies to achieve similar results.

Appendix G, Guidance for Operating a Formal Safety Management System. This may be useful for operators in conducting an SMS gap analysis. These types of tools are needed and important for SMS development.

UK Safety Regulation Group Safety Management Systems – Guidance to Organizations. Although this document is labeled a guidance document, it does not provide operators with guidance provided beyond ICAO Document 9859 – Safety Management Manual. In fact, the document's introduction section encourages operators to use the

ICAO Safety Management Manual. ICAO uses this as their principal source of guidance on SMS. The document provides neither a guide nor a standard. The document consists of outlined bullet items listing processes common to SMS which can be easily gleaned from other documentation.

Transport Canada TP 13739 Introduction to Safety Management Systems. This document is designed to be an introduction to SMS and does not provide a specific standard. This document also provides a general high-level overview of SMS and provides some real-world examples which many operators may find helpful.

Transport Canada TP13881E Safety Management Systems, A Guide to Implementation. This document is one of the more helpful development materials for operators. The document is appropriately titled a 'guide', but it does not provide examples for operators to learn from or tools for operators to modify and use.

Transport Canada TP13844 Score Your Safety Culture. These types of tools are valuable to operators as they develop and implement their SMS. Operators can use the checklist developed by James Reason.

Transport Canada TP14326E Safety Management System Assessment Guide This material provides a good tool which operators can use to evaluate their SMS. The document would prove useful for many operators during all phases of SMS implementation. The assessment guide is a good example of tools operators need to assist in SMS development.

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3.d. There are some good third party materials available to the industry. Much like regulating authorities' SMS development materials, the third party materials are most useful when taken in whole. Operators are able to borrow ideas and concepts from many of these materials and develop relevant SMS programs for their organizations.

IATA Operational Safety Audit (IOSA). The IOSA program provides an excellent resource for all operators, but may prove more beneficial to the medium and large operators. The IOSA checklist can be 'reverse-engineered' and used as a source to conduct proactive risk analysis based on the operator's systems. The checklists are also valuable in developing an operator's Internal Evaluation Program to evaluate safety controls.

IS-BAO. IS-BAO provides some good development tools. The IS-BAO standard places more emphasis on an Operational Risk Profile than any other standard. The SMS Toolkit provided by IBAC, for a fee, provides materials which are sufficient for only the smallest operators, such as small corporate-fleet operators. The IS-BAO certification process has proven effective in motivating many corporate flight departments to seek the certification partly due to the competition among corporate flight departments for the certification, but also due to the fact that the certification in many ways sets the standard for SMS in the Part 91 corporate flight industry.

Regional Air Cargo Carriers Association. RACCA provides SMS Lite as a boilerplate SMS template. The template may be sufficient for the smaller operators, but would be insufficient for mid to large-sized operators. The boilerplate is also lacking any description of system assessment, system analysis (design), or data acquisition and analysis. Noticeably missing is the requirement for the operator to develop an Operational Risk Registry and manage risks based on the operator's system design. The RACCA SMS Lite template is also noticeably deficient in defining an operator's emergency response plan, a key element of SMS.

3.e. International Helicopter Safety Team (IHST). The International Helicopter Safety Team has produced a sufficient SMS manual template to get the smallest operators working toward SMS. The IHST SMS Tool Kit is perhaps the most useful single source for the smallest fixed- and rotor-wing organizations. Also included are checklists, forms, and sample performance measures.

Medallion Foundation. The Medallion Foundation Five-Star Program contains many elements of SMS. The five "stars" of the program; Safety Program, CFIT, Operational Control, Maintenance/Ground Services; and Internal Audit, can be tied into an operator's SMS program. The Medallion Foundation has been working on integrating SMS into the five-star program.

ICAO. ICAO has produced the Safety Management Manual which is the most comprehensive non-commercial SMS implementation material available. The manual provides the ICAO SMS standard, but also details SMS processes and provides example policy and tools. The manual is especially helpful for the largest operators. [67.1]

A. Operations and Training Comments:



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- 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
    - a) Yes, it is valid to the rule
  - 2) Is it valid to the discussion? Yes or no
    - a) Yes, it is valid to the discussion
  - 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
    - a) What's good and what's not good in the guidance.
  - 4) Is it a scope related comment? Yes or no
    - a) Yes, Scalability for a smaller organizations and different operators.  
Operators may modify and use as appropriate within their organizations.
    - b) Noted as a duplicate – review the Aviation Safety Council of Alaska comments.

#### 6.3.18 Other Comments

- A. From Bombardier Aerospace: Below is a general assessment of the various guidance materials listed above as well as recommendations for improvement.

Bombardier's assessment of the following documents:

a. FAA Order VS8000.367, AVSSMS Requirements, Appendix B: Appendix B provides the basic requirements for establishing an Aviation Safety program. There are several open issues that should be resolved prior to any "new rulemaking" including how audits are conducted (self or third party) and legal (risk management, regulatory and statutory). Emphasis on metrics as a measurement of the various elements and/or components of the SMS must focus on improvements to the processes and safety rather than a numeric scorecard of reportable events.

#### 1) Operations and Training Comments:

- a) The group does not concur with (a.) above as Sentence 1 incorrectly identifies VS8000.367, as an Aviation Safety program, when it is in fact it is FAA internal guidance document concerning SMS programs.
- b) The group does concur with the concept of the last sentence in (a) above in that SMS programs shall rely on metrics measurements within the program to improve management decisions and processes lead to improved safety overall.
- c) b.AC-120-92, Introduction to Safety Management Systems for Air Operators: This Advisory Circular provides a general organizational standard for Air Operators such as flight test organizations, air taxi operators, pilot training centers and corporate flight departments. Although the AC is helpful with respect to organizational issues it avoids the more difficult issues. For example, the safety risk management section

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approaches risk management without taking into account unintended legal consequences associated with risk analysis and assessment.

2) Operations and Training Comments:

- a) The group does not concur with the commenting party's assertion in that SMS by design mitigates litigation through the employment of risk analysis and assessment.
- b) c.Foreign Civil Aviation Authorities SMS Development Material: The ICAO Safety Management Manual and guidance documents provided by the various foreign civil aviation authorities, and in particular Transport Canada are useful sources of information for the development of Aviation Safety and Management policies and processes, particularly with respect to flight operations, training centers and maintenance centers, however, additional information is required regarding implementation of a SMS program by an OEM.

3) Operations and Training Comments:

- a) The group concurs with (c) above.
- b) d.Third Party Material: The material reviewed provides sufficient guidance for flight operations, training centers and maintenance centers to develop and implement an SMS program. The referenced material, however, is inadequate when it comes to implementation of an SMS program by an OEM.

4) Operations and Training Comments:

- a) The group concurs with (d) above.
- b) The IATA integrated-Airline Management System is an integration of key management system is impacting safety within an airline and provides fundamental guidelines to implement management systems for each operational function, as required by IOSA Standards and recommended practices.

5) Operations and Training Comments:

- a) The group has no comment on the above recommendation
- b) IS-BAO developed by the International Business Aviation Council (IBAC) and its member associations, is a code of best practices designed to help flight departments worldwide achieve high levels of safety and professionalism. At the core of the IS-BAO is a scalable SMS tool for business aircraft operators, from single aircraft/single-pilot operations to large multi-aircraft flight departments.

6) Operations and Training Comments:

- a) The group has no comment on the above recommendation
- b) The SMS guidance material should provide additional guidance in the following areas:

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- c) Develop simple, flexible and applicable guidance material for maintenance, design and manufacturing organizations and business aircraft flight operations (Part 91K) taking into consideration already existing regulations and Quality Management Systems;
- 7) Operations and Training Comments:
    - a) The group has no comment on the above recommendation
    - b) Provide examples of "best practices" for developing and implementing SMS for all sectors of the aviation industry;
  - 8) Operations and Training Comments:
    - a) The group has no comment on the above recommendation
    - b) Provide guidance on how audits (QMS, SMS, IS-BAO, etc) will be managed with the intent of minimizing duplication;
  - 9) Operations and Training Comments:
    - a) The group has no comment on the above recommendation
    - b) Develop clear and consistent terminology, definition and translation of SMS elements specifically to the activities of design, manufacturing and maintenance;
  - 10) Operations and Training Comments:
    - a) The group has no comment on the above recommendation
    - b) Develop industry standard for risk assessment and safety performance metrics;
  - 11) Operations and Training Comments:
    - a) The group has no comment on the above recommendation
    - b) If the FAA incorporates a concept of acceptable level of safety, this should be expanded upon in the guidance material as well. [44.2]
  - 12) Operations and Training Comments:
    - a) The group has no comment on the above recommendation
- B. HEICO Aerospace: FAA Order 8000.367, AVSSMS Requirements, Appendix B: we find this document to be in line with the current COS System Requirement and program instituted at HEICO Aerospace.

AC-120-92, Introduction to Safety Management Systems for Air Operators: we find this document to be in line with the current COS System Requirement and program instituted at HEICO Aerospace.

Foreign civil aviation authorities' SMS development material and third-party material: If all the organizations had a similar set of guide lines it would make it easier for all to conform with little difficulty. [85.1]

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1) Operations and Training Comments:

- a) COS is only activated when something happens. Group finds it difficult to correlate AC-120-92 and FAA Order 8000.367 (an operating activity AC and Order) to a manufacturing requirement (COS).
- b) For foreign civil authorities, recommend that FAA work with ICAO to ensure international harmonization and mutual recognition of state SMS requirements.
- c) Commenter could be talking about the volume of SMS material currently provided by various states, which provides a variety of compliance methods, none of which are neatly aligned.

C. Northern Air Cargo: Currently, there are broad sources of materials available to operators which are aimed at defining SMS standards. Many of these sources are similar in content and, when taken in whole, operators may gain a better understanding of SMS elements. Unfortunately, there does not seem to be sufficient materials available to assist operators in implementing SMS within their organizations.

3.a. No help.

3.b. This guidance material, provided by the FAA, has mixed benefit and its sufficiency can be argued. On one hand, the circular provides an SMS overview, which is positive. On the other hand, sections of the circular seem to be academic in nature and written at a level which new entrants to SMS likely will not understand. The fact that the functional requirements in Appendix 1 are aligned with the ISO 14001 standard is positive. The framework of the functional requirements are also formatted similar to the Code of Federal Regulations and may be considered a framework in writing SMS regulation. The framework is lacking robust continual improvement elements found in Quality Management Systems and the ANSI Z10-2005 Occupational Health and Management Systems Standard. The 120-92 Advisory Circular contains limited language regarding continual improvement; yet continual improvement is core to any quality management system which SMS is based in. One significant problem SMS entrants face is associated with the lack of relative examples. The Advisory Circular does not provide real-world examples of how an operator would apply SMS.

3.c. There are several different development materials available from foreign civil aviation authorities. Most of these materials are very similar in nature. The value of the materials is gained when they are taken in whole and compared with each.

UK Safety Regulation Group CAP 712 Safety Management System for Commercial Air Transport Operators. This document provides a sufficient high-level overview of SMS. Of particular help are Appendix A – Hazard Identification and Risk Assessment Log which provides operators and example of how they might document the Hazard Identification and Risk Assessment process. The first template provides a sufficient example which operators may modify and use as appropriate within their organization. The second example demonstrates that there are various methodologies to achieve similar results.

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Appendix G, Guidance for Operating a Formal Safety Management System. This may be useful for operators in conducting an SMS gap analysis. These types of tools are needed and important for SMS development.

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ICAO Safety Management Manual. ICAO uses this as their principal source of guidance on SMS. The document provides neither a guide nor a standard. The document consists of outlined bullet items listing processes common to SMS which can be easily gleaned from other documentation.

Transport Canada TP 13739 Introduction to Safety Management Systems. This document is designed to be an introduction to SMS and does not provide a specific standard. This document also provides a general high-level overview of SMS and provides some real-world examples which many operators may find helpful.

Transport Canada TP13881E Safety Management Systems, A Guide to Implementation. This document is one of the more helpful development materials for operators. The document is appropriately titled a “guide”, but it does not provide examples for operators to learn from or tools for operators to modify and use.

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Transport Canada TP14326E Safety Management System Assessment Guide This material provides a good tool which operators can use to evaluate their SMS. The document would prove useful for many operators during all phases of SMS implementation. The assessment guide is a good example of tools operators need to assist in SMS development.

3.d. There are some good third party materials available to the industry. Much like regulating authorities’ SMS development materials, the third party materials are most useful when taken in whole. Operators are able to borrow ideas and concepts from many of these materials and develop relevant SMS programs for their organizations.

IATA Operational Safety Audit (IOSA). The IOSA program provides an excellent resource for all operators, but may prove more beneficial to the medium and large operators. The IOSA checklist can be “reverse-engineered” and used as a source to conduct proactive risk analysis based on the operator’s systems. The checklists are also valuable in developing an operator’s Internal Evaluation Program to evaluate safety controls.

IS-BAO. IS-BAO provides some good development tools. The IS-BAO standard places more emphasis on an Operational Risk Profile than any other standard. The SMS Toolkit provided by IBAC, for a fee, provides materials which are sufficient for only the smallest

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operators, such as small corporate-fleet operators. The IS-BAO certification process has proven effective in motivating many corporate flight departments to seek the certification partly due to the competition among corporate flight departments for the certification, but also due to the fact that the certification in many ways sets the standard for SMS in the Part 91 corporate flight industry.

Regional Air Cargo Carriers Association. RACCA provides SMS Lite as a boilerplate SMS template. The template may be sufficient for the smaller operators, but would be insufficient for mid to large-sized operators. The boilerplate is also lacking any description of system assessment, system analysis (design), or data acquisition and analysis. Noticeably missing is the requirement for the operator to develop an Operational Risk Registry and manage risks based on the operator's system design. The RACCA SMS Lite template is also noticeably deficient in defining an operator's emergency response plan, a key element of SMS.

3.e. International Helicopter Safety Team (IHST). The International Helicopter Safety Team has produced a sufficient SMS manual template to get the smallest operators working toward SMS. The IHST SMS Tool Kit is perhaps the most useful single source for the smallest fixed- and rotor-wing organizations. Also included are checklists, forms, and sample performance measures.

Medallion Foundation. The Medallion Foundation Five-Star Program contains many elements of SMS. The five "stars" of the program; Safety Program, CFIT, Operational Control, Maintenance/Ground Services; and Internal Audit, can be tied into an operators' SMS program. The Medallion Foundation has been working on integrating SMS into the five-star program.

ICAO. ICAO has produced the Safety Management Manual which is the most comprehensive non-commercial SMS implementation material available. The manual provides the ICAO SMS standard, but also details SMS processes and provides example policy and tools. The manual is especially helpful for the largest operators. [73.1]

#### D. Operations and Training Comments:

- 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - a) Yes.
- 2) Is it valid to the discussion? Yes or no
  - a) Yes.
- 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
  - a) Yes.
  - b) These comments are similar to those of Chantilly Air in that there must be concrete examples of how an operator would apply SMS.
- 4) Is it a scope related comment? Yes or

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a) Yes.

- E. From a Retired FAA Employee whose background includes 27 years of service with the FAA and served as: the Director of the FAA Aircraft Certification Service; FAA Associate Administrator for Regulation & Safety; and Industry Chair of the FAA Certified Design Organization Advisory Committee: I support the guidance material issued by the FAA related to SMS. This is a good first step toward a general understanding of the principles that must be embodied in any SMS program. These are general concepts on how an SMS program should be structured and implemented within an aviation company, and this general guidance has its plusses and minuses. On the plus side, being general principles, this guidance material can be applied to any size of company conducting any type of aviation business regulated by the FAA. This advisory material defines what must be a part of any good SMS system, leaving the company free to define how those principles will be implemented within the culture of the company. On the minus side, being general principles, they leave much open to interpretation and makes it difficult for the FAA and industry to arrive at common definitions of what is required for compliance. These issues were addressed within the CDO ARC and the final CDO report defines how the ARC proposed to deal with these matters. This will be further discussed below in the additional comments.

Regulations and guidance material provided by other international regulatory authorities are helpful, but they often cannot be directly applied within the United States because of statutory and regulatory differences that may exist between the United States and other countries. Only after those differences are thoroughly understood, can the regulations and guidance from other countries have meaning within the FAA construct. Thus, this is useful reference material but must be carefully scrutinized before it can be directly adopted by the FAA. [28.1]

F. Operations and Training Comments:

- 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - a) Yes,
- 2) Is it valid to the discussion? Yes or no
  - a) Yes,
- 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
  - a) No, the comments are very general
- 4) Is it a scope related comment? Yes or no
  - a) No

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## 6.4 Question 4

Do you currently have a quality management system (QMS) that meets some accepted standard (e.g., ISO-9000, Six Sigma, Baldrige)? How would you envision your existing system operating in an SMS framework?

6.4.1 From the Air Transport Association of America, Inc. (ATA): All ATA carriers employ a Quality Management System (QMS) arising from their regulatory experience in maintenance. Programs such as CASS (Continuing Analysis and Surveillance System), Quality Assurance (QA), Quality Control (QC), Maintenance Reliability Review Boards (MRRBs), Service Difficulty Reports (SDRs), and Required Inspection Items (RII), and the FAA's Air Transport Oversight System (ATOS) all militate toward quality management.

In addition, audits like Internal Evaluation Programs (IEPs), IATA Operational Safety Audits (IOSAs), Foreign Codeshare Audits, and the DoD Air Carrier Survey Program have created a "zero finding" focus on System Operations, Dispatch, Maintenance Control, Crew Training and Passenger Service. IOSA, in particular, addresses ICAO Standards and Recommended Practices (with some U.S. "differences" filed by the FAA) and places a high premium on company executive management.

Since quality management initiatives have already begun and are well underway in all functional areas, this is clearly an advantage in SMS implementation. ATA does not, however, subscribe to the belief that attainment of a quality standard (i.e., ISO-9000, Six-Sigma, or Baldrige Award competition) is absolutely necessary or advisable for a Part 121 aviation service provider/airline not engaged in a manufacturing process. The reason is that all of these initiatives are somewhat competitive, and ATA passengers are generally better served by airlines focusing on SMS implementation in the current economic environment. Quality management places a large premium on customer satisfaction, economic efficiency, zero defect production, "just in time" inventory control, and other facets of lean processes that produce excellent outcomes. SMS looks primarily at systemic vulnerabilities that will, if not addressed, result in undesirable states that can progress to an incident or accident. QMS and SMS are mutually supportive, but SMS should enjoy primacy over QMS.

One ATA carrier's Maintenance Quality Assurance department has been working to obtain ISO 9001 registration by the end of the year; its Airline Operations Quality Management System is ISO 9001:2000 registered. Functional elements of a company heretofore indirectly involved primarily in safety acquire a keen interest in the "quality process" that is adaptable to "enterprise risk" - "financial risk," "market risk," "inventory risk," "security risk," and other variables that translate across the board from "safety risk." The airline is confident its existing system operation will integrate with SMS framework easily. [51.1] – **Reviewed by O & T, No comments**

6.4.2 From the Air Medical Operators Association (AMOA): All respondents indicated that their QMS either currently meets Six-Sigma and in some cases the ISO-9000 standard or they are phasing in QMS standard in their respective organizations. While some QMS processes are in their infancy, it is clear that project and quality management are integral



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to safety assurance and continual improvement. [52.1] – **Reviewed by O & T, No comments**

- 6.4.3 From Delta Airlines, Inc.: Currently our Quality and Data Analysis organizations are ISO registered in addition to using Six Sigma methods for data analysis. The expectation is that the two systems (ISO and SMS) will co-exist and operate in parallel. [56.1] – **Reviewed by O & T, No comments**
- 6.4.4 From Virgin America Airlines: Virgin America was certificated in 2007 with a Quality Management System (QMS). [40.1] – **Reviewed by O & T, No comments**
- 6.4.5 From Ameriflight, LLC: While we do have a quality management function in the Repair Station and via the CASP associated with our 135.411(a)(2) maintenance program, we have not made any attempt to embrace ISO, Six-Sigma, etc. We do not believe that QMS and SMS are entirely congruent. For example, QMS doesn't address work practices that might result in personnel injuries. [2.1] – **Reviewed by O & T, No comments**
- 6.4.6 SMS4Aviation, LLC is very small however; we have implemented a QMS 9001 program for the purpose of understanding our customers' needs and concerns. Our service company provides SMS and we have always maintained that the SMS, EMS, QMS must be fully integrated together, not stand alone documents. Therefore, we have attempted to stress to our clients the need to establish a very concise policies and procedures manual and insert it into your process 2.2.3. That means all other safety related programs fit nicely into that Process. We have found that to be most effective and beneficial to achieving the stated goals of the SMS. [3.1] – **Reviewed by O & T, No comments**
- 6.4.7 From Jet Logistics, Inc.: JLI does not utilize a Quality Management System (QMS). [6.1] – **Reviewed by O & T, No comments**
- 6.4.8 From Miami Air International: In our Maintenance Department, we have continuously expanded and evolved our Quality Assurance Program in conjunction with our CASS program. These programs have allowed us to be reactive and proactive, as well as predicatively respondent to developing operational errors. Our existing system, operating in an SMS framework, will add another layer of safety. That added layer will fortify existing system controls to allow us to better identify potential hazards, we can then prevent their occurrence by affecting system change. [11.1] – **Reviewed by O & T, No comments**
- 6.4.9 From Omni Air International: Omni is currently engaged in an International Air Transport Association Operational Safety Audit registration process. Registration requires conformity to comprehensive quality management standards. To our view, IOSA seamlessly merges the concept of quality management systems into safety management. [80.3] – **Reviewed by O & T, No comments**
- 6.4.10 From Aero Micronesia, Inc. d/b/a Asia Pacific Airlines: We have developed a proposed SMS; however, we have chosen to delay implementation to focus on ATOS which was effective for us on January 1, 2008. Aligning our management processes with ATOS has resulted in the rewriting of our CASS in 2008 and development of an IEP in June 2009. To the extent that ATOS has impacted these and other structured, risk-based systems for

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managing company programs, the impact has been enormous. However, we are hopeful that the process improvements we have made under ATOS will ease our transition into a regulatory requirement for an SMS. [65] – **Reviewed by O & T, No comments**

6.4.11 From Chantilly Air, Inc.: Chantilly Air, Inc. does not currently have a standard-complying quality management system [81.1] – D.Other Comments

6.4.12 Other Comments

A. From Bombardier Aerospace: Summary of the Bombardier Aerospace quality management system (QMS) approach: Bombardier Aerospace applies a number of approaches and philosophies as part of its business operations to assure that all facets of the organization are performing to the highest levels of quality.

In general the Bombardier Aerospace quality management system (QMS) was developed to meet the following requirements, as applicable for manufacturing, maintenance, distribution, licensing, and airworthiness certificates:

- AS/EN/JISQ9100 Revision B and ISO 9001:2008;
- Environmental Management per ISO 14001:2004;
- AS9100 International Standard
- TCCA: CAR 505, 507, 509, 511, 561, 571, 573, 591, 593, 604 and 605;
- FAA: Title 14 CFR Part 21 Subparts F and G; Title 14 CFR Part 145 Subpart D, as applicable, FAA Order 8100.7 Aircraft Certification Systems Evaluation Program and other FAA requirements;
- EASA: Part 21 Subpart G;
- Mexican DGAC: Standard NOM-021/5-SCT3-2001;
- For Training purposes: TCCA CAR 566; EASA Part 147, JAA (Joint Aviation Authorities) Type-Rating Training Organization (TRTO); FAA Title 14 CFR Part 142; and the design and provision of flight crew and aircraft technical training, and the post training evaluation of trainee competencies for Bombardier Business and Regional Jet Customers.
- Other tools and approaches include Bombardier Transportation Integrated Processes, Six Sigma, and many others.

We envision a complimentary relationship between the QMS and SMS

•SMS should not force duplication of efforts or cause non-value added work. The emphasis of SMS needs to be on those additional elements or the next level requirements of an already compliant quality system.

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•The FAA should carry out a gap analysis to define those areas that are already covered by an organization that is compliant with existing QMS requirements/standards. [44.2] – **Reviewed by O & T, No comments**

- B. HEICO Aerospace: HEICO Aerospace Quality Management system is documented to the AS91 00 Standard, and has implemented a COS that is in line with the AC-120-92 & FAA Order 8000.367. [85.1]
- C. From a Retired FAA Employee whose background includes 27 years of service with the FAA and served as: the Director of the FAA Aircraft Certification Service; FAA Associate Administrator for Regulation & Safety; and Industry Chair of the FAA Certified Design Organization Advisory Committee: The cited quality management systems (QMS) are excellent standards and practices for defining an internationally acceptable quality system within a company. The continued compliance to company policies and procedures that these systems provide can be a useful part of any company SMS program, but they should not become a requirement of any SMS. These systems address the quality of the processes and procedures implemented within a company to comply with specified goals and objectives, including continued compliance with specific FAA regulations. These ensure that consistent outcomes will always be achieved, but the QMS standards themselves do not define what those outcomes should be. That is why ISO QMS standards can be applied to everything from the manufacturer of paper bags to large transport airplanes. Even the FAA in their notice correctly defines SMS as something more than just compliance with the regulations. These QMS standards are necessary quality processes and an essential element of any SMS, but they should not be viewed as sufficient for SMS implementation.

For proper SMS implementation there needs to be more than just a quality audit standard, there must be a “process model” that defines how an organizational culture can be created that addresses the basic principles of safety management in everything it does. In short, there must be a process model that measures an organizational culture – and ISO and other QMS principles cannot perform that function. The CDO ARC recognized the need for something more than QMS standards and adopted the FAA Integrated Capability Maturity Model (iCMM) as that process model. This CMM concept is discussed further in the general comments. [28.1]

## 6.5 Question 5

If you have voluntarily developed, or are in the process of developing an SMS, what impact has SMS had on your organization in terms of enhanced safety and compliance with existing CFRs?

- 6.5.1 From The Transport Workers Union of America, AFL-CIO (TWU): TWU is currently involved with the joint development of an SMS for the In-flight Department at Southwest Airlines. Within Southwest Airlines, TWU is evaluating internally-applied flight operations, maintenance, and engineering safety regulations with the goal of developing an integrated SMS throughout the entire industry, rather than airline specific. For example, if an SMS identified “door arming” as a consistent safety problem, then training programs could be tailored to identify strengths and weaknesses in existing safety protocol with respect to actual scenarios. Training departments would more accurately

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integrate safety hazard management with standardized programs. When reviewing accident statistics over the past two decades, it is a clear indicator that SMS operates to enhance aviation safety, particularly in the realm of flight operations, dispatch, maintenance, engineering, and other self-reporting programs. [47.1] – **Reviewed by O & T, No comments**

- 6.5.2 From the Air Transport Association of America, Inc. (ATA): Significant enhancements in safety and compliance should be credited to the current voluntary programs already in place. ATA air carriers’ existing safety programs already contain most elements of an SMS and function effectively in identifying risk, promoting mitigation strategies, and providing routine monitoring for effectiveness. These processes almost always far exceed the minimum required for “compliance,” going far forward in the mitigation of risk. They have become intrinsically fundamental to a safe operation. ATA airlines look forward to furthering the benefits of these programs through SMS.

ATA carriers’ initial experience with SMS implementation suggests that there are significant “early returns on investment.” All ATA carriers have used risk/hazard identification and a mitigation strategy within many areas of their operation. Development of SMS goes hand-in-hand with the shift to an evolving FAA Air Transport Oversight System environment. Transition to an integrated and comprehensive SMS will further enhance organizational and operational safety.

Everyone, management and employees alike, are learning the new “common language” of safety. The success of safety awareness programs has improved the airline safety culture and willingness to report errors. Employees become more involved in key safety program elements (e.g., workplace safety committees and/or quality action teams). The knowledge of how common mistakes occur has provided an opportunity to improve processes and build in prevention methods. A premium is placed on prior planning using SMS to avoid previously indiscernible negative factors when acquiring new aircraft, new technologies, or new markets.

Once a hazard is identified, risk-assessed and mitigated, the documentation developed in the rationale is becoming perceived internally more as “process improvement” for safety awareness and proactive performance vs. a “risk of discovery” in the event of litigation. [51.1] – **Reviewed by O & T, No comments**

- 6.5.3 From the Allied Pilots Association (APA): APA has been an active participant in the development of ASAP and FOQA. Both programs have had tremendous impact in identification of safety hazards. In our experience, this has greatly enhanced our overall safety of operation. [76.1] – **Reviewed by O & T, No comments**
- 6.5.4 From the Air Medical Operators Association (AMOA): AMOA respondents report overwhelming safety enhancements as organizations implemented SMS and those programs matured. The SMS process/framework has improved the ability of these organizations to identify and reduce operational risk, increase the level of safety awareness for all employees, identify continuous improvement opportunities, and improve regulatory compliance. The programs instituted in conjunction with the SMS have given these organizations greater clarity on the operation and safety/quality/compliance issues. It has increased safety awareness at all levels and continues to facilitate communication

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among the different areas of safety responsibility. It provides senior leadership with information not consistently provided previously, and it has provided a formal structure, process and documentation methodology that enhances our operational safety. [52.1] **Reviewed by O & T, No comments**

- 6.5.5 From Delta Airlines, Inc.: By applying principles of the SMS to the operational areas of our business that lack a comprehensive risk-based approach to manage safety; Delta Air Lines has seen some successes in reducing risk, decreasing operating costs, and managing safety through a structured process.

In addition to impact the application of SMS has in the operating areas of the business it has also brought definition and advancement to the operational areas by bridging the gap and allowing for a common and robust risk-based system to manage safety. This implementation has evolved a discipline of adding the risk assessment process to other areas of the business. [56.1] **Reviewed by O & T, No comments**

- 6.5.6 From Virgin America Airlines: Our SMS has been a significant help in improving our safety performance and regulatory compliance. We assess our progress with external tools, including the FAA's Air Transport Oversight System (ATOS) and the IOSA. [40.1] **Reviewed by O & T, No comments**

- 6.5.7 From Ameriflight, LLC: Our SMS is not in place yet. We anticipate that it will result in reduced personnel injuries (and consequent reductions in Workers Compensation costs), equipment damage, a more proactive approach to safety involving all employees that participate in SMS, and ultimately will produce an overall increase in operating efficiency. We do not believe it will have a significant effect upon regulatory compliance (except as to compliance with whatever SMS rule is eventually put in place). [2.1] **Reviewed by O & T, No comments**

- 6.5.8 From Jet Logistics, Inc.: Our SMS program has had a major and immediate impact on the safety of our operations. A true SMS program forces a pilot (if utilized properly) to approach the "go/no go" decision as more of a process, meaning it takes the gray area out and makes it a scientific approach. This forces pilots to stick close to the regulations as the SMS program should be built around safety, regulations, guidance, and industry best practices. [6.1] **Reviewed by O & T, No comments**

- 6.5.9 From Miami Air International: We have been participating in the SMSPP since August of 2008 and are in the developmental stage of the SMS process. Even at this early stage we can see the positive effects of the program. [11.1] **Reviewed by O & T, No comments**

- 6.5.10 From Omni Air International: Our existing voluntarily developed safety management system has had a significant impact on our ability to detect possible non-conformities to policies and regulations before an accident or serious incident has occurred and has reinforced the corporate commitment to ensuring that, in all functions, we maintain the highest level of safety in the public interest. Our safety management system takes us well beyond simple "compliance with existing CFRs" and recognizes the more restrictive requirements of the host nations in which our operations are conducted. [83.1] **Reviewed by O & T, No comments**

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6.5.11 From Chantilly Air, Inc.: Chantilly Air, Inc.'s internal quality assurance program has measured quantifiable improvements in safety after implementation of an SMS. For example, Chantilly Air, Inc.'s safety reporting program now receives an average of 203 reports per 10,000 departures. By comparison, the fractional operator NetJets receives an average of approximately 65 reports per 10,000 departures under its ASAP program. Chantilly Air, Inc. views its own strong performance as good evidence of the success of its SMS, and the strength of the safety culture that SMS has helped build. [81.1]  
**Reviewed by O & T, No comments**

6.5.12 From Frontier Alaska: In general, the components of SMS which are currently in place have enhanced the safety at our organization. The employee reporting and feedback system (AC 120-92 6.3.6) is particularly successful and we have seen an increase in reported hazards year over year due in part to the positive feedback generated by the identification of hazards. We have a process in place which collects and analyzes the data, monitors trends, and distributes that information back to the affected employees. Compliance with CFR's is verified and improved upon throughout this process. [67.1]  
**Reviewed by O & T, No comments**

6.5.13 From Treyfact, Inc.: From an aircraft manufacturing perspective, Treyfact has observed the positive changes that occur within organizations that are implementing SMS, as well as the "growing pains" that occur when introducing change affecting cultural behaviors. One organization, whose senior leaders communicated frequently about the importance of safety and SMS implementation, experienced their lowest employee injury rate in company history. Likewise, processes were established in the Flight Operations department that empowered flight crews by introducing risk assessment and risk management as performance expectations. A better understanding of safe operational boundaries has occurred as a result. The concept of a just culture is still quite new to this company, but it has positively influenced the successful collection of important (internal) process information related to product quality issues affecting flight safety. [23]  
**Reviewed by O & T, No comments**

#### 6.5.14 Other Comments

A. From Bombardier Aerospace: Impact of SMS in terms of enhanced safety: although Bombardier Aerospace has started implementing SMS in several areas of its business, it is too early to tell quantitatively its impact, but the following qualitative improvements have been observed:

- SMS concepts correlate well with existing systems that focus on performance based self evaluation, safety and continuous improvement;
- Implementation of SMS has contributed to an increased safety awareness and improved employee engagement and involvement in managing safety;

Impact of SMS in terms of compliance with existing CFRs

Most design, certification and manufacturing organizations have implemented comprehensive corrective action systems to ensure that the products they manufacture are safe and reliable although the current CFRs are not explicit

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regarding OEM safety management requirements post-certification. In this regard, the FAA should conduct a gap analysis and implement SMS regulations to fill in the gaps in the current regulations. [44.2]

- B. HEICO Aerospace: Our organization has developed and implemented several key aspects of SMS, including formal rapid response to field inquires, risk based analysis for all technical questions, COS Policy and Checklist throughout the organization. [85.1]
- C. From the Aviation Suppliers Association (ASA): Many ASA members have implemented quality assurance systems that meet many of the requirements of an SMS program. This has been accomplished voluntarily by the distribution industry as part of the Voluntary Industry Distributor Accreditation Program (VIDAP).

The Voluntary Industry Distributor Accreditation Program (VIDAP), was published by the FAA in Advisory Circular 00-56 in September 1996. The FAA set basic quality standards that they expected every accredited distributor to meet, and they chose several sets of industry standards (e.g. ASA-100 and ISO 9000) to supplement those quality standards. In order to become accredited, a distributor must meet both the standards established in AC 00-56 and also the additional standards set in the industry standard. This variety of supplemental industry standards permits companies to establish a Distributor Accreditation System that meets the individual needs of the company while still supporting the safety performance goals published in the FAA and industry standards.

Through voluntary standards, a noticeable change has occurred in the aircraft parts distribution industry. Distributors have become positive forces for safety in the industry – identifying potential safety issues and reporting them to appropriate authorities in order to resolve issues before they become safety problems.

The distributors have also had a positive effect on other sectors of the industry, for example the program has had a positive effect on documentation standards that are used to certify and ensure regulatory compliance, including a positive effect on enhancing traceability from the manufacturer to the end-user, especially for rotatable parts that may have had inadequate traceability in the past. This is an important addition to safety despite the fact that the FAA regulations do not require traceability.

For a more detailed account of the positive effects that distributor accreditation has had on safety, see Voluntary Industry Distributor Accreditation Program (AC 00-56), FY 2004 Audit Report, prepared by Aircraft Certification Service & Flight Standards Service, FAA-IR-04-03 (September 22, 2004). [70.1]

- D. Northern Air Cargo: NAC's hazard identification program greatly improved our overall safety culture. Averaging over 60 hazard reports per month over the past three years, NAC's management and their employees have reduced workplace and operational hazards throughout the company. [73.1] Reviewed by O & T, No comments

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## 6.6 Question 6

Which types of product/service providers should be required to have an SMS and which, if any, should not? Please explain the reasoning for your opinion.

6.6.1 From The Transport Workers Union of America, AFL-CIO (TWU): Since operations programs seek to operate at peak performance, TWU believes that that Operational Departments who have a direct impact on the day-to-day safety operations (particularly in high-risk disciplines such as maintenance, flight planning, weight and balance, crew scheduling, and weather providers) should be required to have SMS programs. If a full SMS program is unavailable, SMS principles should be applied until a complete SMS program is implemented. Application of such principles until a complete SMS program is available enhances the safety of both the flying public and airline employees. [47.1]

**Reviewed by O & T, No comment.**

6.6.2 From the Air Transport Association of America, Inc. (ATA): One size does not fit all. A Safety Management System is a business process with Safety as its core value. If the merit in SMS is its universality and scalability, it would be useful in most organizations. Scalability recognizes that a two person operation will have a different SMS structure than an organization with 300 aircraft and 40,000 employees. However, the principles applied are the same regardless of the size or type of operation.

Who should have an SMS? Part 121 airlines, Part 135 Air Taxis and Commuters, Part 91 “Fractional Jet” or “On Demand” carriers, Original Equipment Manufacturers (OEMs), Maintenance & Repair Organizations (MROs), Aviation Technical Training facilities, and Airports should adopt SMS.

ATA sees no reason the Safety Management System model could not, and should not, be applied to any operational organization. The fundamentals of Safety Management Systems are sound and should be in place in all aviation service provider organizations that affect the safety of the traveling public. However, given the number of variables in the application of an SMS, specific requirements should be kept at a general level in regulations. The operational mandate should make clear that an organization must have the elements of a sound safety system, while allowing the organization to tailor its SMS to its operational environment. The SMS should ensure a risk management strategy, safety promotion, and safety assurance programs are in place.

One concern is less about who should have an SMS, but rather how customer/supplier programs will interface, and the potential for inconsistent oversight requirements being placed upon an aviation service provider/airline. For example, compliance with, or effectiveness of, a supplier/partner’s SMS should not become an airline’s oversight responsibility. In other words, an operator should not be required to ensure a supplier has fulfilled the requirements for a SMS. On the other hand, probably one of the most difficult challenges for the future will be to create mutually supportive interfaces across multiple SMS environments. A good hypothetical example might involve an airline operating a type of aircraft that is susceptible to damage from foreign object debris. The interfaces would involve the airline, manufacturer, airport(s), and possibly maintenance and repair organizations and technical training facilities. The positive interaction across



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all SMSs would likely be needed to share costs and develop an effective mitigation strategy. [51.1] **Reviewed by O & T, No comment.**

- 6.6.3 From Air Line Pilots Association, International (ALPA): All certificated commercial aviation entities should be required to have an SMS. This includes air operators and maintenance providers, among others. Organizations providing service to these certificated entities, such as food service, and others who typically operate on airport ramp and taxiway areas, should also be required to have an SMS. The activities of these other organizations can adversely affect safety, especially if they do not have an SMS of their own. [69.1] Reviewed by O & T. The regulation should apply to certificated organizations only. The supplier, vendor, and outside providers of such organizations should be inserted into an SMS by providing data and participate in the hazard identification process with the air carrier.

From the Allied Pilots Association (APA): APA supports requiring all commercial and Part 121 air carriers to implement an SMS system. We would not be in a position to comment on non-Part 121 carriers as to the impact or need for an SMS system. [76.1] **Reviewed by O & T, No comment.**

- 6.6.4 From the Association of Flight Attendants – CWA (AFA): All providers of products and services that directly impact aviation safety should be required to have a strong, functioning SMS program in place that is actively inspected, monitored and evaluated by the FAA. These providers include, and are not limited to, the following business categories: airframe manufacturers; suppliers of mission critical hardware and software packages necessary to ensure safe flight operations and effective training programs for aviation personnel; commercial and cargo airline operators; third party contractors providing flight critical equipment or services (e.g., maintenance, training, certification and support) to OEMs, suppliers or airline operators. [59.1] **Reviewed by O & T. SMS should not replace oversight.**

- 6.6.5 From the Air Medical Operators Association (AMOA): As a conscientious industry, it is our opinion that any provider whose product fulfills a safety critical function and/or whose operation exposes its employees to significant operational risk should have an SMS as part of its core corporate management structure and philosophy. Specifically, FAA-regulated air carriers, anyone engaged in public transport, and those organizations that provide critical aviation services support to those air carriers (e.g., OEMs, after market product vendors, repair/overhaul facilities fuel providers, etc.) should incorporate a SMS process/framework as part of their management structure. [52.1] **Reviewed by O & T. The regulation should apply to certificated organizations only.**

- 6.6.6 From Delta Airlines, Inc.: Air Carriers, Airports, Design and Manufacturers, and ATC organizations are required to have an SMS while suppliers, vendors, and outside providers are not required to have an SMS.

The supplier, vendor, and outside providers of such organizations should be inserted into an SMS by providing data and participate in the hazard identification process. Sharing aggregate data between product/service providers and vendors will facilitate the identification of common risks, consistent risk assessment strategy, and effective allocation of resources. [56.1] **Reviewed by O & T. No comment.**

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6.6.7 From Virgin America Airlines: The following product/service providers should be required to have an SMS:

- A. •Part 21 and Part 145 products and parts.
- B. •Part 91, 121, Part 133, Part 135, and Part 136 operators.
- C. •Part 141 and Part 147 schools.
- D. •Software providers and subcontractors. [40.1] **Reviewed by O & T. No comment. Software organizations should not be required to implement an SMS.**

6.6.8 From Ameriflight, LLC: Because of requirements likely to be imposed by ICAO member states, air operators engaging in international operations have little choice but to have SMS. I have some question as to whether it should be required for maintenance-only organizations, unless that is also required by ICAO. While I believe there are clear practical and economic benefits to SMS, I am not convinced that a federally-mandated SMS is necessary for maintenance-only organizations unless required to meet ICAO requirements. [2.1]

***NOTE: Reviewed by O & T. O & T clarification for this comment - Maintenance-only organizations serving operators not required to have an SMS will not be required to have an SMS. Maintenance-only organizations will be required to have an SMS if they serve air carriers having an SMS (covered for heavy check vendors). All SMS elements should be made a requirement for anyone with significant involvement and impact in the air transportation system to protect the traveling public.***

6.6.9 From SMS4Aviation, LLC, We believe that any company inside or outside of the aviation community can benefit greatly from the implementation of an SMS, EMS and QMS. There is no reason why these programs cannot be utilized fully and affordably. Our programs are inexpensive by comparison to most SMS companies. We regularly provide the SMS in the ICAO format for under \$500 while a full implementation only costs \$2000. [3.1] **Reviewed by O & T.**

6.6.10 From Jet Logistics, Inc.: In our opinion, all aircraft operators should develop and comply with an SMS, but at a minimum all “certificated” entities. Everyone involved in all aspects of aviation will benefit from the development of better practices and improved efficiencies, not to mention when the industry as a whole has a lower accident rate we all benefit from lower insurance rates and a better public perception of our ability to operate safely. [6.1] **Reviewed by O & T.**

6.6.11 From Miami Air International: I believe all product/service providers should be required to have an SMS. SMS is the next logical step in Aviation Safety; however the size and scope of the Service Provider should determine the programs complexity, one size or one way does not fit all. [11.1]

***NOTE: Reviewed by O & T. The regulation must be required for certificated organizations only. Further consideration must be made for scalability and one person organizations.***

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- 6.6.12 From the Aviation Safety Council of Alaska (ASCA): Substantial service providers listed in the operators FAA approved Operations Specifications should be considered for inclusion in the SMS rulemaking. Vendors and suppliers whom already fall under the FAA required drug & alcohol programs need to embrace SMS for safety enhancements. Adopting SMS and best practices like ISO can serve to increase efficiencies in the transportation system. [71.1] **Reviewed by O & T.**
- 6.6.13 From Aero Micronesia, Inc. d/b/a Asia Pacific Airlines: We believe that Part 121 operations should be required to have an SMS since they pose the greatest potential risk to the public safety when considering industry size. We believe that Part 135 operators should be included since they also operate in common carriage. While the need may exist for this small class of air carriers, they are perhaps the most vulnerable to the financial impact of implementation. Design of an SMS for Part 135 should be considered separately from the design for Part 121 air carriers. Part 145 providers should also be included since they provide significant services to all operators. Success with SMS has been demonstrated in other industries where “production” is involved. The systems analysis approach to production as undertaken pursuant to Part 145 has proven to be superior to a random sampling process of the end product. Similarly, Part 142 Training Centers should be included in SMS rulemaking. They provide valuable training assistance to many air carriers and crew training has figured in many of the most recent air carrier accidents. We would question the need for an SMS for Part 125 operators (private carriage) since they do not hold themselves out to the public and must maintain a high degree of safety in their operation to ensure a continuing client base and survivability. [65]

***NOTE: Reviewed by O & T. The regulation should be required for certificated organizations, and certain portion of the regulations should be a requirement for the non-certificated organizations. NOTE: The content of this comment should be considered for further deliberation and is vital to a regulation requirement for Part 125 and Part 142 operators.***

- 6.6.14 From Chantilly Air, Inc.: Chantilly Air, Inc. believes strongly that an SMS should be required of all certificated operators listed in the Advance Notice of Proposed Rulemaking. Additionally, however, Chantilly Air, Inc. also believes that any rule must include 14 CFR Part 91 Subpart K program managers. And, while the benefits of SMS should be available to all other 14 CFR Part 91 operators, any rule should include, at a minimum, 14 CFR Part 91 operators of large or turbine-powered aircraft and corporate aviation operations in the sense of ICAO Annex 6 Part II.

Many operators under 14 CFR Part 91, and all program managers under 14 CFR Part 91 Subpart K, are engaged in highly complex operations. 14 CFR Part 91 Subpart K (“fractional”) operators, in particular, offer a service substantially equivalent to that offered by certificated operators. As a result their passengers have expectations of receiving substantially equivalent levels of safety. That equivalent level of safety can only be guaranteed if any SMS rule applies to those operators as well.

In addition, ICAO requires SMS for commercial, non-commercial large or turbojet aircraft, and noncommercial corporate aviation operations. Even if FAA continues to file an ICAO difference for those 14 CFR Part 91 operators' domestic flying, any international flights may still be subject to ICAO requirements, and those operators would benefit from the standardization an encompassing FAA rule would provide.

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Finally, in our experience, an SMS has increased the safety of our operations and been an extremely helpful business and loss control tool. If SMS is a good idea for certificated operators, it is also a good idea for all non-certificated operators. [81.1]

***NOTE: Reviewed by O & T, The Part 91 comment results from a misunderstanding of the ICAO requirements and the FAA's position to file an ICAO difference as indicated in this comment. SMS must be required for certificated operators, but only certain essential elements must be scaled as requirements for non-certificated operators that affect an air carrier or an air operator.***

6.6.15 From Frontier Alaska: Substantial service providers listed in the operators FAA approved Operations Specifications should be considered for inclusion in the SMS rulemaking. Vendors and suppliers whom already fall under the FAA required drug & alcohol programs need to embrace SMS for safety enhancements. Adopting SMS and best practices like ISO can serve to increase efficiencies in the transportation system. [67.1]  
**Reviewed by O & T, No comments**

6.6.16 Other Comments

- A. From Bombardier Aerospace: Bombardier believes that the SMS concept is applicable to all civil aviation product and service providers. Although it is not covered by the ANPRM it would probably also be appropriate for fractional aircraft ownership program management companies operating under Part 91K. [44.2]
- B. HEICO Aerospace: We feel that all repair station & PMA type services providers should be required to participate in this type program in order to resolve problems that arise in which they have familiarity with. [85.1]
- C. Northern Air Cargo: Substantial service providers listed in the operators FAA approved Operations Specifications should be considered for inclusion in the SMS rulemaking. Vendors and suppliers whom already fall under the FAA required drug & alcohol programs need to embrace SMS for safety enhancements. Adopting SMS and best practices like ISO can serve to increase efficiencies in the transportation system. [73.1]
- D. From a Retired FAA Employee whose background includes 27 years of service with the FAA and served as: the Director of the FAA Aircraft Certification Service; FAA Associate Administrator for Regulation & Safety; and Industry Chair of the FAA Certified Design Organization Advisory Committee: With the proper generic SMS principles forming the basis of any FAA regulation and guidance material, any aviation service provider or producer of a product, part, article, or appliance should be required to implement an SMS within their company. The SMS and iCMM principles can be applied to any size company conducting any type of aviation business, as long as the FAA regulations deal with what is required, and not how those requirements must be implemented for specific aviation services or certificate holders. Only the company, that fully understands its management culture, can properly define how a compliant SMS will best function within that culture. [28.1]

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## 6.7 Question 7

If you have implemented an SMS and conducted cost and benefits analyses, please describe your findings.

6.7.1 From the Air Transport Association of America, Inc. (ATA): Few airlines have had the opportunity to perform such a study. However, experience with existing safety programs indicates a business case can be made for implementation. [51.1] **Reviewed by O & T**

6.7.2 From Air Line Pilots Association, International (ALPA): It appears to us that it may be extremely difficult to generate accurate cost information on SMS and therefore a truly representative cost/benefit analysis may be elusive. For example, there may be a safety improvement implemented by an organization that could be outside the purview of SMS yet it may have SMS benefits. Identifying incurred costs that may be an “SMS cost” may be very difficult to define and monitor. [69.1]

***NOTE:** The FAA is obligated to conduct the cost benefit analysis of the rule. Although the costs may be elusive or difficult, activity based costing methods could be used. Actual costs could be determined by analysis of the organizations who have implemented SMS. The estimation of cost is in the measuring process for risk, and analysis method that the organization has in place. Each organization will implement the level of an SMS based upon resource allocation and budgets.*

6.7.3 From the Air Medical Operators Association (AMOA): None of the AMOA respondents conducted a formal cost benefit analysis on implementing SMS. AMOA members as a function of experience and active participation in various forms of safety program management overtime recognize the necessity and benefit of developing and implementing a viable SMS. Historically, it has been an enduring challenge to measure safety from the standpoint of quantifying the number of accidents, incidents, and occurrences that were prevented as a function of implementing safety-related control measures and system/program elements. Lagging indicators such as the number of events and rates are not always an accurate indicator of the effectiveness and benefit achieved through proactive safety management. However, there are certainly indicators and methodologies for measuring safety and these safety metrics (leading & lagging indicators) are integral to managers from an economic perspective and must be included as a tool for any proposed SMS. For example, while it is extremely difficult to attribute safety enhancements directly to cost savings, several air medical operators reported reductions in safety-related occurrence rates that provide a clear and dramatic indicator of the effectiveness of increased safety focus. [52.1]

***NOTE:** This comment mainly relates to benefit, however accident avoidance is not always related to benefit. The benefit, to improved regulatory compliance is also a benefit, which can be tied to reduced costs. This comment is really talking about two or more types of cost. The cost of implementation, the cost of maintaining, and the costs saved by association with the benefits realized.*

6.7.4 From Delta Airlines, Inc.: All issues within a product/service provider are mitigated using a cost benefit analysis based on the operational and business requirements of the organization. All safety issues are mitigated. [56.1] **Reviewed by O & T**

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6.7.5 From Virgin America Airlines: Virgin America has not conducted a cost and benefit analysis of our SMS implementation. [40.1] **Reviewed by O & T**

6.7.6 From Jet Logistics, Inc.: SMS has been implemented, but no cost/benefit analysis done. The general feeling, however, is that we have reaped major benefits for very little cost.

-increased awareness of risks involved for specific flights

-less pressure to take a flight under less than desirable conditions

-reduced insurance premiums (reduced by 20%)

- any flight cancellations now the result of objective data and by group consensus

-formal process in place to report hazards and irregularities. Easier to report.

-no jeopardy for reporting hazards or irregularities

it has been a positive aspect for our marketing efforts being that we are one of the few organizations that can state that we have an internationally recognized SMS already in effect. [6.1] **Reviewed by O & T**

6.7.7 From Miami Air International: Our estimated cost would be approximately \$200,000.00 yearly, our benefits are hard to estimate at this time. [11.1]

**NOTE:** Reviewed by O & T, would be helpful if costing method were broken down to understand how they arrived at the estimate.

6.7.8 Other Comments

A. HEICO Aerospace: No formal SMS program at this time, but as previously stated, we have many if not all key SMS areas covered throughout our Quality System. [85.1] **Reviewed by O & T**

B. Northern Air Cargo: Damage reports for customers freight has been reduced by 40%. Damage to equipment has been reduced by more the 50%. Lost time injuries are down below industry average. [73.1]

**NOTE:** Reviewed by O & T – benefits identified, not associated with the cost savings realized, compared to the cost of implementation or maintenance of the SMS; would be helpful.

6.8 Question 8

What are your main concerns and recommendations in making the transition to an SMS regarding the following?

6.8.1 From the Association of Flight Attendants – CWA (AFA): The AFA feels strongly that line employee representatives must fully participate in collaborative efforts with management and regulators to develop each of the three requirements listed above.

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**Reviewed by O & T, No comments What items above? (There are no items referenced)**

***NOTE:** Employee representatives, are an integral part of every voluntary disclosure program. Employees are an essential part of any safety program, if they do not participate, the organization does not have a safety program.*

In addition, AFA is concerned that SMS implementations, if done incorrectly, may lead to industry and regulatory policies that overly restrict the ability of employee groups and the public to access vital safety-related data that are appropriately de-identified to ensure privacy. A lack of transparency with respect to critical safety data and hazard analyses is a challenge today; SMS should not be used as a way to further shield the commercial interests of the aviation industry to the detriment of the public interest. [59.1]

***NOTE:** Reviewed by O & T – without qualified analysis, just the provision of data, could lead to misuse or interpretation of safety data. Data on its own is not valid without analysis. The FAA’s ASIAs is intended to provide such analysis. However there is concern that at the operational field level analysis by the inspection is inappropriate.*

- 6.8.2 From the Air Medical Operators Association (AMOA): All of the items listed above are going to create a greater administrative burden on both the FAA and the operator, therefore a major goal of any rulemaking should be to keep this process as simple as possible. While collection of data is fairly straight forward, the analysis of that data to include root cause determination and risk assessment/management is a much larger problem. **Reviewed by O & T – agreed should be kept simple, clear and concise.**

We find that one of the most time consuming portions of developing an SMS has been putting the separate systems into written format in order to describe and implement the system. However, this has been an important aspect of the transition from a traditional Safety Program to an SMS. By most standards, many of our respondents are large organizations in which integration and normalization of manuals is a large task. Through the process we have learned that there are a number of informal policy and procedures that require process review, assignment of process owners for oversight and formal documentation. Smaller organizations with a part time Safety Representative will struggle to find the time and resources necessary to develop the needed documentation and develop the programs as SMS is currently defined. **Reviewed by O & T**

It was suggested that there is currently no cost effective automated system to help manage an SMS for large operators. Some would recommend further development and additional funding for Web Based Application Tools (WBAT) to help meet this need. Separate data collection and analysis programs are often incompatible and don’t communicate efficiently with one another, if at all. One system that collects, analyzes, assesses, tracks, assigns corrective actions and provides loop closure for all data sources (ASAP, IEP, FOQA, Line Operations Safety Audit) would be the most effective use of these resources. **Reviewed by O & T**

There are also significant concerns regarding liability and security of safety information as discoverable information during litigation. It is therefore recommended that the development of recordkeeping devices involve legal counsel. [52.1] Reviewed by O & T

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6.8.3 From Virgin America Airlines: Concerns:

- Requirements must be adjustable to the size and nature of an organization. Smaller organizations may need less rigor in documentation and recordkeeping. Smaller organizations might not need full-time personnel to staff a newly-created SMS Office.

**Reviewed by O & T – the requirement would be to have a document control and record control procedures.**

- Current ATOS manual and documentation requirements for “controls” and “process measures” are not accepted as SMS compliant.

**Reviewed by O & T – ATOS is not regulatory**

- An academic documentation requirement for Risk Management Process might slow down and/or impede implementation of Corrective Actions.

**Reviewed by O & T – The persons who write the SMS manual, the processes have to be realistic, applicable to the organization, and clearly understood. Don’t write what you can’t do.**

- Some current, healthy, continuous improvements systems and CASS (121.373) programs might become top heavy and bureaucratic.

**Reviewed by O & T – If your CASS system is operating as it should, effectively and efficiently, it will involve senior management, which is the intent of getting management involvement. The SMS should not affect the well functioning CASS program.**

- Safety information gathered by an organization could be exposed to the public, misunderstood and brought into law courts. If FAA persons have access to this information in an oversight capacity, they should be forbidden (under penalty of law) to disclose such information. This information should not be allowed to be used in enforcement actions. [40.1]

**Reviewed by O & T – FAA management should be able to control their own inspectors – legal protection for safety is going legislative actions to include SMS program.**

6.8.4 From Ameriflight, LLC: Generally speaking, in order to be successful for both the large Part 121 airlines and the small general aviation on-demand operators, the rule and associated guidance must be kept simple, clear, and scalable so implementation by MegaFly Airlines, Mom & Pop’s Air Charter with two airplanes and five employees,, and Joe’s two-person Part 145 avionics shop will be practicable. Especially at the smaller end of the spectrum, excessive complexity will translate into a dusty SMS manual sitting on the shelf and lip-service to SMS.

**Reviewed by O & T**



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Associated guidance for FAA Inspectors charged with approving or accepting operators' SMS must also be kept unambiguous and simple. SMS is inherently not very complicated, resting as it does upon the so-called "four pillars" cited in this ANPRM; the eventual rule and guidance need to adhere to this philosophy.

**Reviewed by O & T – this is in the purview of the FAA to ensure inspectors are trained and qualified.**

Another major concern which will, I believe, need to be addressed by Congressional legislation, is liability associated with implementation of SMS. For example, an operator has SMS in place, including risk assessment and establishment of acceptable levels of risk (as provided for in SMS). An employee gets injured and files a lawsuit against the company. The plaintiff's attorney stands up in court and says, "Do you mean that you understood this operation was inherently risky, but consciously decided to go ahead and do it anyway, resulting in injury to my client?"

**Reviewed by O & T, No comments repetitive comment**

Much like breaching the security of confidential safety reporting systems will cause the sources of the safety reports to quickly dry up, such lawsuits with verdicts favoring the plaintiffs will quickly cause SMS to be held at arm's length by operators. Legal protection for employers along the lines of that provided by the Pilot Records Improvement Act will need to accompany regulatory requirements for SMS if they are to be successful over the long term. [2.1]

**Reviewed by O & T, No comments we concur.**

- 6.8.5 From Omni Air International: We have seen, through participation in voluntary programs such as the Aviation Safety Action Program, that our decision to include the FAA in elements of our existing safety management system has imposed significant recordkeeping requirements to satisfy the Government's desire to compile data into a single database with the ultimate goal of sharing key lessons learned across all operators. Unfortunately, over almost a decade of development and massive expenditures, the FAA appears no closer to being able or willing to share data outside its own offices. Implementation of the FAA's one-size-all approach to "voluntary programs" has drawn critical resources away from some areas while providing us no benefit, outside our own operational experience, from the like experiences of other operators. [83.1]

**Reviewed by O & T – The ASIAS program should be constructed so operators can access and analyze aggregate data for comparison to their operation. This effort is already underway.**

- 6.8.6 From Chantilly Air, Inc.: It is important to understand that the aviation industry, and the on-demand charter and fractional industry in particular, consists of operators that vary widely in size, complexity, scope, focus, and area of operations. Chantilly Air, Inc. urges FAA to note that any SMS requirement be appropriate to the size and complexity of the operation. In other words, a one-size-fits-all approach cannot be used.

**Reviewed by O & T**

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This, however, implies that at the time of validating an operator's SMS, FAA must allow for flexibility in assessing the effectiveness of the operator's SMS. Current third-party audit providers already possess experience in evaluating SMS effectiveness across the wide variety of operators. Chantilly Air, Inc. believes that it would be foolish to disregard the expertise accumulated by these audit providers. In addition, many operators in the on-demand charter and fractional industry are already choosing to undergo voluntary periodic audits. Evaluation of the effectiveness of an operator's SMS could be achieved easily and quickly through that already existing third party channel. [81.1]

### **Reviewed by O & T**

6.8.7 From Treyfect, Inc.: Treyfect is primarily concerned with acceptance at the senior leadership level of every organization transitioning to an SMS. Safety starts at the top and if safety is not seen as a core value, the actions taken in support of developing an SMS are often subject to a highly reactive business environment. As proposed SMS requirements enter into the peripheral vision of senior organizational leaders, safety can begin to emerge as a strategy to gain competitive advantage. The progression can take organizational safety from being reactive, to being proactive and generative, (as initially described through the Safety Spectrum by Bryce Fisher of Transport Canada, in the ICAO Journal, July/August 2005). When safety and safety systems are viewed as a means to maximize and generate profits, the business case for SMS is more easily made. A critical element leading to an organization's cultural change is the demonstrated commitment by senior leaders to support SMS implementation, regardless of market pressures or current economic concerns. This appears to be the largest barrier to SMS acceptance; the ability to "sell" senior leaders on the concepts of SMS and to educate them about the complexities of a system that introduces such vague terms as "human factors" and "just culture". There seems to be a prevailing misconception that SMS can be audited into an organization with a series of checklists. In that regard, our recommendation is that organizations seeking to implement SMS have a very clear understanding of their current state as it relates to leadership commitment, cultural behaviors, existing framework of processes and the maturity of the organization as a whole to accept and manage change. From this point, the processes to support the four pillars of Safety Management might be successfully integrated into a Safety Management System Manual (SMSM) framework. The SMSM would necessarily provide process expectations for hazard identification, safety knowledge management, data collection/recordkeeping, and documentation requirements based on the unique operations of each organization. Fundamentally, the aim is to resolve two factors regarding safety management;

- What an organization has (processes)
- What the organization does (behaviors)

Treyfect has observed that within an organization, several different functional areas may gather information separate and apart from other functional areas in the same organization. How this information is shared among the groups is important and may likely be subject to organizational silos. The collection of information is most valuable when it is systematically shared. Treyfect recommends that the FAA include appropriate language to support the expectation that an organization's internal systems allow information to flow freely between functional areas, reducing the effects of unidentified

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hazards associated with organizational silos. The types of information gathered within an organization may or may not be helpful (internally or externally), but the decisions that must be made based on that information can be critical. Treyfect recommends the FAA include appropriate language supporting the effective management of corrective actions (what an organization does), including documented risk assessments associated with corrective actions, and the establishment of systematic processes to assure closure of corrective actions to eliminate the hazards of organizational change (e.g., leadership). By way of Process safety, this reduces "knee jerk reactions" and also steers further away from the possibility of causing an accident (perhaps in an effort to prevent the last one). [23]

**Reviewed by O & T -**

6.8.8 Other Comments

- A. HEICO Aerospace: Our system has been documented and implemented with little difficulty. If there is one system to adhere, to there should not be any difficulties during implementation or revision. [85.1]

**Reviewed by O & T, No comments**

- B. Northern Air Cargo: Not recognizing our company's accomplishments' with the program we are currently using and instituting a "one size fits all" approach.

Making volunteer programs mandatory.

The idea that SMS will solve all aviation safety problems. [73.1]

**Reviewed by O & T – incomplete thought, not sure what the person is saying.**

- C. From a Retired FAA Employee whose background includes 27 years of service with the FAA and served as: the Director of the FAA Aircraft Certification Service; FAA Associate Administrator for Regulation & Safety; and Industry Chair of the FAA Certified Design Organization Advisory Committee: The collection, management, and sharing of safety information was a specific concern addressed in the CDO ARC report. A company's SMS must, by its nature, address the safety risks associated with the products or services it provides, initial and recurrent compliance with FAA regulations, and continued operational safety. These are presently being addressed to a great extent by the existing FAA regulations and oversight system. But, the SMS must also address the day-to-day management decisions made within a company. It must look at the risks associated with those decisions, why a certain path was taken, and why another path was not taken, when a possible risk or safety need is/was addressed. That requires the capturing, storing, and easy retrieval for future safety risk analysis of major decisions made within every level of a company. This information exposes the company to a level of tort liability not present in today's aviation system.

The FAA has addressed the protection of voluntarily submitted safety data within its regulations and there are significant constraints on how that voluntarily submitted

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data may be used or provided to third parties, including, I believe, the prohibition of the FAA using that data in the justification of safety regulations. Under SMS, there would be no such thing as voluntarily submitted safety data, as every piece of safety data is a part of the required SMS. The CDO ARC made specific reference to this dilemma in its report and recognized that the FAA must address this serious industry concern.

I believe this is a major concern that must be addressed by the FAA in any SMS requirement. Even under the mantra of safety, the industry cannot be expected to make it easy for any litigant to access the day-to-day safety decisions of a company, which is what the record keeping requirements of any SMS will facilitate. The FAA, with the help of Congress, must find a way of protecting SMS data. [28.1]

**NOTE:** Reviewed by O & T – FAA should consider reviewing the CDO ARC documents.

#### 6.9 Question 8.a

Documentation requirements (e.g., developing or updating manuals, policies, procedures, standard operating procedures).

6.9.1 From the Air Transport Association of America, Inc. (ATA): Audits and Manuals. As previously stated, Part 121 ATA air carriers currently have FAA-accepted Internal Evaluation Programs (IEPs) that look, during periodic functional audits, at multi-program integration encompassing ASAP, FOQA, LOSA, AQP, CASS, ATOS, MRRB, SDRs, VDRP, QA, QC, and irregularity or incident reports. Adapting IEP to embrace SMS should not require extensive work. Rather, a time-consuming effort will be required to adapt all auditable processes in current manuals to conform to the SMS concept. ATA members have developed a host of manuals over the years that are independent of one another. Cross-referencing standardizing language, and addressing specific SMS requirements appear daunting. Another challenge is changing the organizational culture that dictates, “the safety department will do it,” to one of safety ownership by each operating division, particularly with regard to risk analysis.

#### **Reviewed by O & T, No comments**

Early experience suggests that operators make timely decisions about whether to implement SMS principles into existing manuals or to create a stand-alone manual for SMS for the entire organization. In addition, ATA would like to understand more about how the transition to an SMS requirement will be phased in. When the regulation is implemented, what is the timeline for an air carrier to be compliant? How will operators be made apprised of any changes to documentation requirements within the regulation and how much time will be allotted to ensure that an operator is compliant?

#### **Reviewed by O & T, No comments**

SMS documentation requirements increase proportionally to the size of an organization. The larger and more complex the organization becomes, the more involved are the tracking requirements. A significant effort is being placed upon database development to

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embrace documentation control and supporting data. Documentation is directly proportional to electronic recordkeeping capability.

**Reviewed by O & T, No comments**

Adequate time must be given to transition existing documentation to support SMS, since many ATA members are very large operators with lots of “moving parts.” ATA recommends that SMS rulemaking permit gradual implementation (phased in a manner similar to the Pilot Program) within the existing manuals system and infrastructure that a carrier has in place. If an SMS rule is adopted, it is recommended that ample time be allowed not only for establishing an approved program, but for providing the extensive amount of training and development of various supporting entities necessary for its success. [51.1]

**Reviewed by O & T, No comments**

- 6.9.2 From Air Line Pilots Association, International (ALPA): A robust SMS is more than good documentation. Documentation that is developed must accurately reflect the SMS program itself and changes that have been made to the program must be quickly and accurately disseminated to all affected employees. Also, it is especially critical that when changes are made to an SMS program, those changes must be tracked to make sure they are implemented at the working level but more importantly, that the changes are bringing about the desired safety improvements. [69.1]

**Reviewed by O & T, No comments**

- 6.9.3 From Delta Airlines, Inc: Numerous changes to the manuals and gap analysis have occurred through the beginning stages of the implementation. Delta Air Lines certainly hopes the standards are defined to ensure the general framework and expectations are finalized. The building of the infrastructure provides room for tactical changes by the organization if necessary. Minor clarifications can be made to the documentation for further evolution of the program by the agency if necessary. Recommendation: Maintenance of the current standard and expectations of the existing documentation. [56.1]

**Reviewed by O & T, No comments**

- 6.9.4 From Ameriflight, LLC: Obviously required, must be kept simple.[2.1]

**Reviewed by O & T, No comments**

- 6.9.5 From Jet Logistics, Inc.: We were already in the process of updating our GOM. The IS-BAO process forced us to look at some items above and beyond what we were legally obligated to cover. We have a better manual as a result. We added an SMS chapter in the GOM as an overview and the Safety Policy inserted into the front of the GOM. Actual Safety Management Manual is a separate document – all pilots get a copy (about 35 pages long). This means any changes we make don't have to go through the FAA approval/acceptance policy. [6.1]

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**Reviewed by O & T, No comments**

- 6.9.6 From Miami Air International: SMS is a living system, continued documentation development and updating is the heart of the system. [11.1]

**Reviewed by O & T, No comments**

- 6.9.7 From the Aviation Safety Council of Alaska (ASCA): Because of the varying operator sizes and complexities, the documentation management must be controlled by the specific organization. Each element of the SMS as it is implemented by the operator should not require any FAA approvals; including either stand alone forms documents, or SMS manuals themselves.

**Reviewed by O & T, No comments**

The AC 120-92 does not state any specific documentation requirements; although the word "documentation" is used throughout the AC, it does not provide any guidelines or examples of what information or data the document should include and how long the documents should be retained. An operator who has little to no exposure to SMS will have a difficult time implementing SMS using the AC.

**Reviewed by O & T, No comments**

The documentation of procedures should be evaluated by the organization and where necessary procedures should be improved or created to provide the employees with the information required to carry out specific tasks. However, the operator should not be required to recite the FAR's word for word in their manuals, when interfaces can be effectively utilized.

**Reviewed by O & T, No comments**

All documentation, to include forms and manuals should include at least annual reviews by the organization's top management, revised when necessary, and effectiveness measured.

**Reviewed by O & T, No comments**

Manuals should be interfaced with other relevant company manuals where necessary to prevent inconsistencies and possible discrepancies within the organization's manual system.

**Reviewed by O & T, No comments**

A flexible timeline of implementation should be included in any regulation, allowing an operator to implement the SMS documents in realistic steps that would allow for the SMS to build on itself over time. Requiring documents to all be created and implemented at once could possibly have a negative impact on the organization by not allowing sufficient time to understand and absorb each element of the SMS program and how they interface and affect each other. [71.1]

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**Reviewed by O & T, No comments**

- 6.9.8 From Aero Micronesia, Inc. d/b/a Asia Pacific Airlines: If the proposed rulemaking for an SMS does not give credit for the system safety programs already in place, the implementation timeline will be long and the financial impact to the operator will be considerable. [65]

**Reviewed by O & T, No comments**

- 6.9.9 From Chantilly Air, Inc.: Excellent guidance on development of manuals, policies, procedures, and standard operating procedures already exists for the general aviation industry at zero or low cost. For instance, NBAA's Management Guide, or IBAC's IS-BAO General Company Operations Manual are excellent resources that simplify implementation of SMS principles. Chantilly Air, Inc. recommends that FAA consider a partnership with these organizations.

**Reviewed by O & T, No comments**

In Chantilly Air, Inc.'s experience, updating of manuals and procedures requires approximately 5 hours per week. Development of internal safety promotion publications requires approximately 2 hours per week. [81.1]

**Reviewed by O & T, No comments**

- 6.9.10 From Frontier Alaska: Because of the varying operator sizes and complexities, the documentation management must be controlled by the specific organization. Each element of the SMS as it is implemented by the operator should not require any FAA approvals; including either stand alone forms documents, or SMS manuals themselves.

The AC 120-92 does not state any specific documentation requirements; although the word "documentation" is used throughout the AC, it does not provide any guidelines or examples of what information or data the document should include and how long the documents should be retained. An operator who has little to no exposure to SMS will have a difficult time implementing SMS using the AC.

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All documentation, to include forms and manuals should include at least annual reviews by the organization's top management, revised when necessary, and effectiveness measured.

Manuals should be interfaced with other relevant company manuals where necessary to prevent inconsistencies and possible discrepancies within the organization's manual system.

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A flexible timeline of implementation should be included in any regulation, allowing an operator to implement the SMS documents in realistic steps that would allow for the SMS to build on itself over time. Requiring documents to all be created and implemented at once could possibly have a negative impact on the organization by not allowing sufficient time to understand and absorb each element of the SMS program and how they interface and affect each other. [67.1]

**Reviewed by O & T – duplicated see ASCA**

#### 6.9.11 Other Comments

- A. From Bombardier Aerospace: It will be very time consuming and expensive for companies to draft and/or revise manuals, policies and procedures to implement all of the aspects of an SMS program as reflected in the current FAA framework. Two of the U.S. service centers have completed level zero and are ready to exit level one. The resources required for level zero and level one included training, travel, external resources as well as internal resources. In particular, the service centers have found completion of the gap analysis required to exit level one to have been very time consuming and difficult. During that time there was and continues to be shifting FAA guidance and interpretations.

The cost associated with implementing a full SMS program is one reason it is imperative that any SMS regulations take into consideration the aspects of safety already incorporated into current regulations.

***NOTE:** Reviewed by O & T – FAA should take into consideration*

- B. Northern Air Cargo: Because of the varying operator sizes and complexities, the documentation management must be controlled by the specific organization. Each element of the SMS as it is implemented by the operator should not require any FAA approvals; including either stand alone forms documents, or SMS manuals themselves.

The AC 120-92 does not state any specific documentation requirements; although the word "documentation" is used throughout the AC, it does not provide any guidelines or examples of what information or data the document should include and how long the documents should be retained. An operator who has little to no exposure to SMS will have a difficult time implementing SMS using the AC.

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All documentation, to include forms and manuals should include at least annual reviews by the organization's top management, revised when necessary, and effectiveness measured.



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A flexible timeline of implementation should be included in any regulation, allowing an operator to implement the SMS documents in realistic steps that would allow for the SMS to build on itself over time. Requiring documents to all be created and implemented at once could possibly have a negative impact on the organization by not allowing sufficient time to understand and absorb each element of the SMS program and how they interface and affect each other. [73.1]

**Reviewed by O & T – duplicated see ASCA**

#### 6.10 Question 8.b

Recordkeeping requirements (e.g., hazard identification data, risk assessment data, corrective actions).

6.10.1 From The Transport Workers Union of America, AFL-CIO (TWU): TWU recognizes that thorough documentation and reliable recordkeeping are fundamental to a robust SMS program. TWU believes that all aspects of hazard identification and corrective actions must be based upon risk-mitigation models rather than behavioral-based models. [47.1]

**NOTE:** Reviewed by O & T – FAA should consider clarifying which models are appropriate, as risk based (systemic models are different than organizational behavior based models).

6.10.2 From the Air Transport Association of America, Inc. (ATA): ATA members would like more clarification on the recordkeeping envisioned for future SMS regulation. If the potential exists for extensive recordkeeping (for regulatory purposes), then these metrics should be made known as soon as possible. Technology resources may need to be allocated to support such activities. Although proper documentation of the program is essential to ensure the longevity of the system, there should be flexibility in the placement of the elements making up the SMS. For example, the Safety Assurance elements of the SMS should be able to be documented in dedicated locations. It would be helpful to have a central document to reference the individual elements, but the minimum standard should only specify documentation in any controlled form.

**NOTE:** Reviewed by O & T – FAA will have to clarify record disposition and retention requirements.

The taxonomy of hazards resulting from the root cause analysis from any of the tool box programs should be centralized. Individual voluntary safety programs may identify hazards in different forms, but the essential common ground should be the result of the root cause analysis hazards needing correction. Additionally, the risk assessment used in any of the programs must allow tracking and trend analysis across the organization. Although corrective action processes may differ among the programs, the fundamental hazards and associated assigned risks will drive the resulting corrective actions.

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**NOTE:** Reviewed by O & T – Analysis are different for each event, and therefore, a tool used one time may not be the best in the next circumstance. FAA should consider if it will limit the use of tools and techniques, and the unintended consequences of limiting analysis by requiring use of specified tools, etc...

Establishing this type of recordkeeping can be an enormous task; it cannot be overstressed that enough time should be allowed to do this properly and efficiently in a large organization. It is obvious that a carrier's SMS must conform to a basic common structure, but at present airlines are unsure how explicit recordkeeping will be. Obviously, the SMS must overlie existing regulations, but it should incorporate some flexibility with regard to how much can be accomplished, and how soon, with available resources. For example, if an IEP or DoD audit turns up findings that show non-compliance in a disparate group of functional areas, it is logical to assume that a follow-up safety action team would validate findings that constituted a safety hazard, after which a risk assessment would identify those that involved a high risk of damage or injury (and would therefore compel a high priority in allocation of resources for mitigation). This does not assume lower risk findings would be ignored, but the whole idea of risk management is to avert a path that would lead to an unintended outcome. Once the teams have learned and developed confidence in these processes, it is less necessary to drill down into specific requirements. [51.1]

**NOTE:** Reviewed by O & T – FAA will have to clarify record disposition and retention requirements.

6.10.3 From Delta Airlines, Inc: Records are maintained and retained. There are no concerns at this time. [56.1]

**Reviewed by O & T, No comments**

6.10.4 From Ameriflight, LLC: Obviously required, must be kept simple. [2.1]

**Reviewed by O & T, No comments**

6.10.5 From Jet Logistics, Inc.: Record keeping is minimal for a company our size. The Flight Risk Assessment Tool form is the one we see the most. We get 1-3 of those daily. I review them and usually wait till weeks end to insert the data into a spreadsheet. Other forms we see sporadically. Total time <1 hour/week. [6.1]

**Reviewed by O & T – example of how one size does not fit all, and if this is the organizations SMS, then that is described.**

6.10.6 From Miami Air International: One of the fundamental building blocks of an SMS is an effective internal reporting program. For the smaller Service Providers, the most efficient way to begin is by implementing the FAA sponsored WBAT program. The WBAT ASAP program has now been expanded to meet the parameters needed for development of the SMS. This program can handle the different demands that SMS will place on the small operators. I do not believe, however, that the manpower support needed to keep this program growing is there. This will become evident as the program grows. [11.1]

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**NOTE:** Reviewed by O & T – consider that an off the shelf software, you will develop the program to meet the software needs, and not the software to meet the program.

6.10.7 From the Aviation Safety Council of Alaska (ASCA): Recordkeeping requirements for hazard identification, risk assessment, and corrective actions should be established by the organization with the industry’s best practices in mind. Recordkeeping requirements should be written and defined by the organization, and audited at least annually by the company’s Internal Evaluation Program or third party if an IEP does not exist. [71.1]

**Reviewed by O & T, No comments**

6.10.8 From Aero Micronesia, Inc. d/b/a Asia Pacific Airlines: Recordkeeping requirements are not likely to increase significantly for most operators. [65]

**NOTE:** Reviewed by O & T – Level of record keeping will increase, the measure of the level of increase is hard to estimate.

6.10.9 From Chantilly Air, Inc: An SMS that is appropriate to the size and complexity of the organization will have widely varying documentation requirements. In its operation, Chantilly Air, Inc. estimates that recordkeeping requires approximately 3 hours per week. [81.1]

**Reviewed by O & T, No comments**

6.10.10 From Frontier Alaska: Recordkeeping requirements for hazard identification, risk assessment, and corrective actions should be established by the organization with the industry’s best practices in mind. Recordkeeping requirements should be written and defined by the organization, and audited at least annually by the company’s Internal Evaluation Program or third party if an IEP does not exist. [67.1]

**Reviewed by O & T – duplicate ASCA**

6.10.11 Other Comments

A. From Bombardier Aerospace: Based on the FAA SMS Implementation Guide (rev. 2), as part of any SMS program a company must have a records management policy. Via regulation, the FAA currently defines retention periods for certain documents. Those regulations should be sufficient. If the FAA has concerns about the period of time with which documents are retained, those concerns should be specifically addressed via a change in the current FAA regulations. So long as a company is compliant with the document retention rules in the current regulations, it seems inappropriate for the FAA, as part of an SMS program, to dictate whether or how a company should develop a document management program.

**Reviewed by O & T – FAA should clarify records retention and disposition requirements.**

Protection of safety data for both record-keeping and data collection requirements of SMS must be addressed before collection and tracking of data begins. [44.2]

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**Reviewed by O & T**

- B. Northern Air Cargo: Recordkeeping requirements for hazard identification, risk assessment, and corrective actions should be established by the organization with the industry's best practices in mind. Recordkeeping requirements should be written and defined by the organization, and audited at least annually by the company's Internal Evaluation Program or third party if an IEP does not exist. [73.1]

**Reviewed by O & T – duplicate ASCA**

6.11 Question 8.c

Collection, sharing, and management of safety information (e.g., protection of and access to personally identifiable information, propriety information).

***NOTE:** Reviewed by O & T - Rules for the protection of safety information and data in voluntary programs, needs to be expanded to encompass the SMS data, data collection, safety information, and analysis of data. This may require congressional legislation, as well as rule making. This is an area of concern that must be addressed by the FAA!!!*

- 6.11.1 From The Transport Workers Union of America, AFL-CIO (TWU): TWU recognizes importance of data-sharing. However, TWU seeks to better understand how the mechanisms for data collection through the industry-wide SMS will be stored and protected to ensure the integrity of voluntary programs and the membership involved. Specifically, TWU seeks to ensure that such data that could be used for punitive purposes is redacted. A redaction will mitigate arbitrary or capricious uses of such information against those individuals included in such data. [47.1]

***NOTE:** Reviewed by O & T - Rules for the protection of safety information and data in voluntary programs, needs to be expanded to encompass the SMS data, data collection, safety information, and analysis of data. This may require congressional legislation, as well as rule making. This is an area of concern that must be addressed by the FAA!!!*

- 6.11.2 From the Air Transport Association of America, Inc. (ATA): The collection, sharing, and management of safety information will likely see few obstacles with organizational leadership buy-in for the SMS. Divisional or departmental "silos" present challenges, but the formal initiative, documentation, and process behind the SMS should help to reduce those challenges. SMS will not change the personal information collected in the current voluntary programs, but will change how the information is used. The method of sharing information beyond individual voluntary programs should not necessitate the need for additional identifying information, and obligatory non-punitive statements should be robust enough to mitigate any concerns.

The industry should, however, address how the information can be used in connection with litigation and the FAA should consider implementing a regulation that would, by law, make ASAP information and other information shared under a voluntary disclosure program exempt from discovery in litigation. Proprietary information should only become an issue when aggregate information is shared outside of the organization and

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there should be a process for ensuring non-disclosure agreements that provide adequate protection to participating carriers are in place.

FAA should not require the sharing of any safety data that cannot be protected, and should provide avenues for cooperative carriers to correct deficiencies discovered in the SMS process without concern for certificate action. ATA members would like more clarification on how the information collected within the SMS operating system (to include all air carriers) will be shared and protected. What type of regulatory guidance will exist to ensure that the information that is collected within an SMS will remain protected? Consideration must be given to how existing protections applied to voluntary programs can be maintained (or enhanced) in an environment wherein the voluntary programs may be directly linked to a mandated program. Will there be the potential for de-identified information sharing among the air carriers? Where will the data be collected and stored?

Additionally, protections for general data gathered and analyzed through SMS must be properly defined. In particular, documentation requirements related to risk identification and assessment and the determination of “acceptable risk” must be properly protected to preclude the potential for post-event critique of previously-identified and catalogued risks by outside parties. [51.1]

**NOTE:** Reviewed by O & T - Rules for the protection of safety information and data in voluntary programs, needs to be expanded to encompass the SMS data, data collection, safety information, and analysis of data. This may require congressional legislation, as well as rule making. This is an area of concern that must be addressed by the FAA!!!

6.11.3 From Air Line Pilots Association, International (ALPA): Collection, sharing, and management of safety information is a critical aspect of any SMS. Deidentified and protected safety information can provide important safety information and lessons while aggregate safety information can identify problem areas and trends. All information generated by an SMS program must be protected to ensure that it is used solely for aviation safety purposes. [69.1]

**NOTE:** Reviewed by O & T - Rules for the protection of safety information and data in voluntary programs, needs to be expanded to encompass the SMS data, data collection, safety information, and analysis of data. This may require congressional legislation, as well as rule making. This is an area of concern that must be addressed by the FAA!!!

6.11.4 From the Allied Pilots Association (APA): Our main concern in transitioning to an SMS program is that adequate safeguards be provided from both the employees’ and company’s perspectives. Having adequate safeguards for safety information and limiting its use for appropriate safety enhancement is absolutely crucial to a robust SMS system. The value of this protection was clearly demonstrated by the protections afforded to ASAP participants. Tremendous amounts of safety data have been made available by protecting such information from being used in FAA enforcement. Limiting FAA enforcement regarding voluntary submission of safety reports and not allowing voluntarily provided information to be used against the employee has been further enhanced by American Airlines’ removal of company discipline regarding non-sole-source ASAP reports. These principles must be found in all SMS programs to have active participation by employees.

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Additionally, companies must have protections from inappropriate use of safety data. Any such abuse would have a limiting effect of the companies' willingness to commit to an SMS system. [76.1]

***NOTE:** Reviewed by O & T - Rules for the protection of safety information and data in voluntary programs, needs to be expanded to encompass the SMS data, data collection, safety information, and analysis of data. This may require congressional legislation, as well as rule making. This is an area of concern that must be addressed by the FAA!!!*

6.11.5 From Delta Airlines, Inc:

- A. The relationship between the operators SMS and the FAA's surveillance responsibilities are ambiguous.
- B. The operator's obligation to provide the data and the regulators responsibility in the SMS process is vague.
- C. Delta believes the agency's inclusion in the management review and the sharing of data is integral to an effective SMS, however due to the privacy and protection concerns, the operators have uncertain expectations of how the regulator would react and handle the shared data. Airlines that implement SMS must have guidance on the sharing of SMS management review and data elements.
- D. There is no guidance or requirement regarding the regulatory agencies release of information of the data under the FOIA request act. This includes privacy and protection of data/information shared between airline and FAA. [56.1]

***NOTE:** Reviewed by O & T - Rules for the protection of safety information and data in voluntary programs, needs to be expanded to encompass the SMS data, data collection, safety information, and analysis of data. This may require congressional legislation, as well as rule making. This is an area of concern that must be addressed by the FAA!!!*

6.11.6 From Ameriflight, LLC: Obviously required, must be kept simple.[2.1]

**Reviewed by O & T, No comments**

6.11.7 From Jet Logistics, Inc.: All forms and reports go through the Director of Safety and only he, the Director of Ops, and the Chief Pilot know who has submitted it. In some cases, however, the pilot (or other employee) has made a safety suggestion/change and we want to recognize those folks.

Each month we share safety news and information in the form of a Safety Newsletter that goes out electronically to each employee (the difference between the IS-BAO SMS requirement and the proposed FAA one is that the IS-BAO concerns itself with ALL levels of a company – even the accounting department!). We do not mention names of pilots or employees who have encountered a hazard or irregularity, but do share an employees name when they come up with a good idea. [6.1]

**Reviewed by O & T – Good best practices**

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6.11.8 From Miami Air International: For small Service Providers, the tool for collecting data has been developed, is available and accessible via the WBAT program by UTRS. The sharing of the information can be handled by the Aviation Safety Information Analysis and Sharing (ASIAS) system managed by the Mitre Corporation. The Management of the safety information is gathered by the company and supplied to both the WBAT and ASIAS program by the Service Provider. Protection of access to personally identifiable information, as well as protection of proprietary information, are already built in and are part of these programs. A quote from the ASIAS web page to underscore the need for support for both the WBAT and the ASIAS programs “A phased approach continues to be followed in the construction of this system. Additional data sources and capabilities will be available as the system evolves in response both to expanded access to shared data and to technological innovation.” This aggregation of safety data is what needs to happen for this program to succeed. [11.1]

**Reviewed by O & T -**

6.11.9 From the Regional Airline Association: The FAA guidance material needs to emphasize that SMS data developed by an air carrier is to be treated as protected information even though the voluntary disclosure programs may be considered as part of a mandatory SMS.

We need FAA guidance to ensure that disclosed risk assessments and corrective actions are treated by the FAA as privileged data of the air carrier. Safety data collected by the FAA and removed from the air carrier premises subject to FOI. We see that it would be appropriate for the FAA inspector to view the risk assessments and plans for corrective action by an air carrier but that all SMS data is treated as proprietary information of the air carrier. [22.1]

**NOTE:** *Reviewed by O & T - Rules for the protection of safety information and data in voluntary programs, needs to be expanded to encompass the SMS data, data collection, safety information, and analysis of data. This may require congressional legislation, as well as rule making. This is an area of concern that must be addressed by the FAA!!!*

6.11.10 From the Aviation Safety Council of Alaska (ASCA): Collection, sharing, and management of safety information: Access to proprietary information should not be included in any information sharing requirements of the SMS rulemaking. Information sharing must be used to enhance aviation safety only and should not include any legal recourse which would allow the safety information to be used for litigation purposes. If an operator is utilizing a SMS they should not have to accept any additional legal liability while creating, implementing, and using a system that is positively effecting safety management.

The AC 120-92 does not discuss or note how and what information would be shared and who that information would be shared with or what method would be used to collect the data amongst operators. Defining the parameters for information collection and sharing would be required.

All information sharing rulemaking must include provisions that information can be de-identified prior to sharing and distributing the internal safety data so that the information does not identify any specific operators, persons, or manufacturers. [71.1]

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**NOTE:** Reviewed by O & T - Rules for the protection of safety information and data in voluntary programs, needs to be expanded to encompass the SMS data, data collection, safety information, and analysis of data. This may require congressional legislation, as well as rule making. This is an area of concern that must be addressed by the FAA!!!

- 6.11.11 From Aero Micronesia, Inc. d/b/a Asia Pacific Airlines: Government policies already in place to protect proprietary information should provide the degree of security desired by most operators. We believe that success in an SMS may require a greater degree of information sharing between operators than now exists under ATOS. Further, we would hope that mandating an SMS will cause the FAA to re-evaluate the effectiveness of such programs as the reporting of Service Difficulty Reports and Mechanical Interruption Summaries. The operator benefits very little from the analysis of the voluminous amount of information presently being input to these databases. [65]

**Reviewed by O & T, No comments**

- 6.11.12 From Chantilly Air, Inc.: There are several mechanisms available for management of safety information. Chantilly Air, Inc. has chosen to manage its safety information internally, and has chosen not to use publicly available tools for data management. The reason is a concern over the control over safety data, as follows. [81.1]

**Reviewed by O & T, No comments**

- 6.11.13 From Frontier Alaska: Collection, sharing, and management of safety information: Access to proprietary information should not be included in any information sharing requirements of the SMS rulemaking. Information sharing must be used to enhance aviation safety only and should not include any legal recourse which would allow the safety information to be used for litigation purposes. If an operator is utilizing a SMS they should not have to accept any additional legal liability while creating, implementing, and using a system that is positively effecting safety management.

The AC 120-92 does not discuss or note how and what information would be shared and who that information would be shared with or what method would be used to collect the data amongst operators. Defining the parameters for information collection and sharing would be required.

All information sharing rulemaking must include provisions that information can be de-identified prior to sharing and distributing the internal safety data so that the information does not identify any specific operators, persons, or manufacturers. [67.1]

**Reviewed by O & T – duplicate of ASCA**

- 6.11.14 Other Comments

- 6.11.15 From Bombardier Aerospace: The collection, sharing and management of the documents related to safety risk management are very troubling. From a purely legal perspective, there is no way to protect such information from discovery in litigation. Even if there is an additional FOIA exemption created to protect SMS data, this regulation does not protect the information from disclosure once a company is in litigation. Both federal and state



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courts are extremely liberal in granting discovery requests and there is no practicable way at present to keep this information protected.

**NOTE:** *Reviewed by O & T - Rules for the protection of safety information and data in voluntary programs, needs to be expanded to encompass the SMS data, data collection, safety information, and analysis of data. This may require congressional legislation, as well as rule making. This is an area of concern that must be addressed by the FAA!!!*

There are a multitude of methods and processes to identify and correct safety issues. Businesses should be free to use processes they have already created and be free to redefine and redevelop new improvements that suit their individual needs. The risk matrix is only one aspect of that guidance, leaving room for companies to make their own decisions on how to implement. [44.2]

**Reviewed by O & T, No comments**

6.11.16 Northern Air Cargo: Collection, sharing, and management of safety information: Access to proprietary information should not be included in any information sharing requirements of the SMS rulemaking. Information sharing must be used to enhance aviation safety only and should not include any legal recourse which would allow the safety information to be used for litigation purposes. If an operator is utilizing a SMS they should not have to accept any additional legal liability while creating, implementing, and using a system that is positively effecting safety management.

The AC 120-92 does not discuss or note how and what information would be shared and who that information would be shared with or what method would be used to collect the data amongst operators. Defining the parameters for information collection and sharing would be required.

All information sharing rulemaking must include provisions that information can be de-identified prior to sharing and distributing the internal safety data so that the information does not identify any specific operators, persons, or manufacturers. [73.1]

**Reviewed by O & T – duplicate see ASCA**

6.12 Question 9

What are the initial and recurrent costs of establishing and maintaining SMS processes (e.g., internal auditing and evaluation, data collection, employee training, computer software, personnel hiring and training)?

6.12.1 From the Air Transport Association of America, Inc. (ATA): Current internal oversight processes can most likely adjust their scope and schedule to accommodate modest SMS needs without additional resources. Most airlines do not expect additional personnel resources needed for altering the internal oversight processes or software capability, but should expect to realize an initial and recurring cost for the additional need to oversee or administer the SMS. SMS processes will draw on resources for additional processing of data and SMS training, but increased efficiency (potential cost savings due to

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consolidation of software applications) can be anticipated to offset much of the initial investment in some instances.

Although it is difficult to estimate the net aggregate cost associated with implementation and maintenance of a SMS, it is safe to say it could require significant investment in software applications to transition to a centralized collection, analysis, monitoring and recordkeeping system. This will depend greatly on existing business practices and organizational structure. For example, if a carrier outsources functions like aircraft maintenance, ground support, catering, and some portion of personnel/crew training, in-house data management may be simplified. New processes to measure mitigation effectiveness may require data parameter creation (collection flexibility).

Costs will depend on the results of the gap analysis and priorities of implementation. Implementation costs could become substantial, depending upon the indicated level of data tracking and the capability to manage safety effectively across multiple functions in an organization. Some effort can be redirected internally, but added workloads that cannot be ignored, such as additional evaluations by Quality Assurance Programs, Internal Evaluation Programs or other safety evaluation processes. We recognize an effective SMS will require additional dedicated staffing to administer.

Executive training is currently offered by various vendors at a cost of roughly \$3,000 - \$5,000 for a single individual attending a 3-4 day off-site course. A multi-year monetary footprint would be required to establish and train safety action teams consisting of line managers and senior labor leaders that currently comprise “safety committees” (e.g., maintenance planning, depot-level maintenance, line maintenance, inventory control, stations/airport services, fleet support, load planning, dispatch, maintenance control, system operations, pilot training and standardization, In-flight training, etc.) A typical consulting firm could charge \$3,000 - \$5,000 for 3-4 days of on-site training and facilitation for a class of 25-30. Less intensive training and facilitation would be needed for entry level employees, junior workforce, and business office functions (sales/marketing, finance, schedule planning, IT, communications, general counsel, etc). A typical consulting firm might charge \$2,000 - \$3,000 for 2 days of on-site training and facilitation for a class of 25-30. If a theoretical airline consisting of 50,000 employees intended to train a critical mass of 20 executives, 500 line managers, and 2,000 relatively junior employees, the initial first year cost would be \$8.6M USD (not counting loss of productivity while away from their position). This constitutes a significant investment just to “kick start” SMS. [51.1].

**Reviewed by O & T – informative on methods to evaluate potential future costs.**

- 6.12.2 From the Air Medical Operators Association (AMOA): While the AMOA survey did not lead to any specific cost analysis, and due to the fact that our survey pool extends to both large and, from our perspective, small operators, it is difficult to develop a definitive cost number by organization. Further, the current definition of SMS is diverse in scope and leads to further inaccuracies in a cost analysis.

That said, AMOA, based on the experience of its members, can provide a rough cost estimate for SMS implementation. For a mature SMS program that includes the implementation of the procedures and documentation changes; enhanced communication

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centers, additional personnel and training; flight data management devices, program costs, and additional personnel; and the added operational expenses for the overall organization to maintain that system, the estimated costs would be between \$20,000-\$30,000 per aircraft in start-up and approximately \$5,000 per year in recurrent costs. [52.1]

**Reviewed by O & T, No comments**

- 6.12.3 From Delta Airlines, Inc: Based on the current SMS framework requirements, every operator will require a significant amount of infrastructure to implement and maintain a system to manage safety both as a basic requirement and in spirit. Delta has not tracked costs associated with the implementation; investment in technological systems, basic SMS familiarization and risk assessment training, and dedicated program resources; however there have been significant costs for implementation and the investments are justified. Delta Air Lines strongly believes in the SMS concept. [56.1]

*NOTE: Reviewed by O & T – realistic, program costs should be available for industry to use, as this will determine, the level of SMS resources invested. No cost information available, could place smaller organizations in a financial bind.*

- 6.12.4 From Virgin America Airlines: We have not quantified the initial or recurrent costs of establishing and maintaining our SMS processes. The primary resource involved is staffing for internal auditing, internal evaluation, data collection/analysis/sharing, and training. [40.1]

**Reviewed by O & T – categories of costs.**

- 6.12.5 From Ameriflight, LLC: Not known at this time. They will obviously vary widely with the size of the operation involved. We hope that they will be balanced by monetary savings from increases in efficiency and reductions in lost time, equipment damage, Workers Comp costs, etc. [2.1]

**Reviewed by O & T, No comments**

- 6.12.6 From SMS4Aviation, LLC: Initial cost varies greatly. We provide robust SMS programs that can be self-implemented. As mentioned above, our cost is low, which is a function of our experience with SMS and our small operating cost. Being a small family owned business provides us many advantages in controlling cost, plus we firmly believe that companies need to implement their own programs to achieve full “buy-in”. We assist operators during their implementation process, which as you know is on-going. The only way a company will fully understand and use the SMS as other companies have for decades is to implement, train and customize it to fit their own needs. In terms of recurrent cost, we always recommend to our clients that they obtain a “Confirmation of Conformity” declaration from someone not connected with their operation to ensure that their SMS is performing well. Our company charges \$1300 for the declaration at this time.[3.1]

**Reviewed by O & T – inappropriate to use docket comments to be used for advertising.**

6.12.7 From Jet Logistics, Inc.: Since we haven't had the SMS for a year, yet, there are no recurrent costs yet. For initial costs we present this ESTIMATE (we didn't count the hours or resources needed, so these numbers are guesses).

<b>Tasks</b>	<b>Estimated Initial Costs</b>
Establish an SMS	300-400 hours by the Director of Safety (includes self audit and external audit). Done over an 8 month process
Data collection	no measurable cost
Employee training	approximately 1 hour each employee
Computer software	\$0
Personnel hiring/training	\$0

**Reviewed by O & T – incomplete expectations for training costs.**

6.12.8 From Miami Air International: A module for IEP is being added to WBAT program for this purpose. Additional personnel will be required for initial and recurrent training as well as maintenance of the program. [11.1]

**Reviewed by O & T, No comments**

6.12.9 From the Aviation Safety Council of Alaska (ASCA): Using the Medallion Foundation Star and Shield Programs as examples, initial costs can be estimated by the fact that some operators have taken from one year to three years to complete one element (Star). These elements are very similar to SMS elements and processes. Utilizing two or more employees over that period of time, one can easily calculate a minimum of 1000 man hours for each Star Element.

Companies will have to hire one or more qualified employees to manage the data collection and internal audit/evaluation programs. This will be very difficult for smaller companies.

Costs associated with implementation will include initial training for all employees.

Training should be planned for three levels of any company; Executives, Directors/Managers and the front line employee groups and include:

- A minimum of 2-4 hours for initial SMS training for all employees and additional training for specific departments.
- Recurrent training should include review of company lessons-learned and pertinent hazard reports or audits finding
- Software programs to manage an SMS can cost more than \$100,000 to acquire and \$20,000 per year for licensing fees.

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•A significant part of an SMS system involves the interface for company procedures through a well developed manual system.

Third party manual development type programs can start around \$250K and work their way up depending on company size and complexity. The price of a manual system alone can make the difference between profits or a loss for a small operator. [71.1]

**NOTE:** Reviewed by O & T – good resource for other operators to review, in understanding the costs associated with implementation. Could help develop a basic cost model structure.

6.12.10 From Aero Micronesia, Inc. d/b/a Asia Pacific Airlines: The initial and recurrent costs of establishing an SMS will likely be considerable for small and medium size carriers that do not have the management structure in place for processes such as internal auditing and evaluation, data collection, employee training, etc. To the extent that SMS rulemaking incorporates current FAA system safety programs, the ease of transition and financial impact should be less. The FAA needs to be very cautious regarding imposing SMS requirements that could result in costly management layering and duplicity. Further, it would appear to us the implementation of an SMS separate from existing auditing and evaluation programs will require some degree of costly automation even in the smallest carriers. The manual administration of SMS auditing and evaluation programs may not lend itself to being cost effective. [65]

**Reviewed by O & T, No comments**

6.12.11 From Chantilly Air, Inc: Chantilly Air, Inc. estimates that the total cost of initial development of an SMS for its operation is on the order of \$70,000, over a period of 12 months. This includes salaries, employee time (internal auditing, development, and training), third-party development assistance, and initial external audit.

Chantilly Air, Inc. estimates that the recurrent cost of maintaining SMS processes is on the order of \$50,000 per year. This includes salaries, employee time (internal auditing, safety assurance, and training), and recurrent external audits. [81.1]

**Reviewed by O & T, No comments**

6.12.12 From Frontier Alaska: Using the Medallion Foundation Star and Shield Programs as examples, initial costs can be estimated by the fact that some operators have taken from one year to three years to complete one element (Star). These elements are very similar to SMS elements and processes. Utilizing two or more employees over that period of time, one can easily calculate a minimum of 1000 man hours for each Star Element.

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- A minimum of 2-4 hours for initial SMS training for all employees and additional training for specific departments.
  - Recurrent training should include review of company lessons-learned and pertinent hazard reports or audits finding
  - Software programs to manage an SMS can cost more than \$100,000 to acquire and \$20,000 per year for licensing fees.
  - A significant part of an SMS system involves the interface for company procedures through a well developed manual system.

Third party manual development type programs can start around \$250K and work their way up depending on company size and complexity. The price of a manual system alone can make the difference between profits or a loss for a small operator. [67.1]

***NOTE:** Reviewed by O & T – see ASCA - good resource for other operators to review, in understanding the costs associated with implementation. Could help develop a basic cost model structure.*

#### 6.12.13 Other Comments

- A. From Bombardier Aerospace: The overall cost of establishing and maintaining a company wide integrated SMS at Bombardier Aerospace is undetermined at this time. However based on the Bombardier Flight Operations experience to date, it has cost considerably more than forecasted for both start up and sustainment, particularly with respect to training and data management. Furthermore, because the introduction of SMS mandates a safety cultural change, the payback in the SMS investment may be difficult to measure. In addition to the cost of training and data management, there is also the initial cost of the gap analysis, implementation of some new processes and the continued cost associated with oversight. [44.2]

**Reviewed by O & T, No comments**

- B. HEICO Aerospace: A Technical Operations organization was established and employed several experienced Team Members to manage, monitor, implement and train. This group provides technical and regulatory oversight for our operating units. [85.1]

**Reviewed by O & T – good approach for buy in from different company groups.**

- C. Northern Air Cargo: Using the Medallion Foundation Star and Shield Programs as examples, initial costs can be estimated by the fact that some operators have taken from one year to three years to complete one element (Star). These elements are very similar to SMS elements and processes. Utilizing two or more employees over that period of time, one can easily calculate a minimum of 1000 man hours for each Star Element.

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Third party manual development type programs can start around \$250K and work their way up depending on company size and complexity. The price of a manual system alone can make the difference between profits or a loss for a small operator. [73.1]

***NOTE:** Reviewed by O & T – see ASCA -good resource for other operators to review, in understanding the costs associated with implementation. Could help develop a basic cost model structure.*

### 6.13 Question 10

What impact has SMS had on your organization in terms of the resources necessary to implement and maintain the system?

6.13.1 From the Air Transport Association of America, Inc. (ATA): The “impact” varies cross-functionally throughout the breadth of the organization. Most airline functions have historically been subjected to internal audits to control loss due to theft, mismanagement of resources, duplication, unreliability, or safety vulnerability. Audits are reactive tools, and only yield an indication of the wellness of an organization at the particular time the audit was conducted. Audits seldom produce a forecast of events to come. In some departments, software systems aggregate data and deliver trends or metric “indicators” depicting the health of the process and/or impact on the enterprise. Yet these indicators are also lacking as predictors of future success or failure.

**Reviewed by O & T, No comments**

Typically, Maintenance and Engineering/Technical Operations, Flight Operations, Finance, and Human Relations departments are the most advanced in “hazard (threat)

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detection, risk assessment (both “safety” and “enterprise” risk), mitigation development, and measures of mitigation effectiveness. Other departments have historically enjoyed less sophisticated means to gather data, train in data analysis, and create a “dashboard” to monitor continuous improvement. The airline business is often very reactive to external pressures (the traveling public, the regulator, Congress, and the media). This generally results in daily 9:00 a.m. inter-departmental telephone conferences that concentrate on shortfalls or missed opportunities often caused by a lack of contingency planning, communication, or timely reallocation of resources.

**Reviewed by O & T, No comments**

SMS, when implemented across all corporate functional areas, provides a common language for analysis and a strategy for continuous improvement. Safety and enterprise risk can be closely examined in terms everyone can clearly appreciate – shared beliefs, values, and norms. SMS creates a blueprint for solution-sharing to “bubble up” from the workforce, where reality is truly experienced in a 24 X 7 environment. Senior Managers can apply that experience to develop meaningful safety metrics, thus ensuring that “mitigation effectiveness” is not merely the absence or recurrence of an undesired event. In a fully implemented SMS, accidents and injuries should sharply reduce, while productivity, reliability and efficiency should increase, and the “bottom line” for shareholders should flourish.

**6.13.2 Reviewed by O & T, No comments**

6.13.3 Significant resources are applied to safety programs in the current environment and expenditures to prompt enhancement of those program will continue regardless of SMS rulemaking. ATA members are closely following the SMS process to ensure the resources applied to safety programs align with international safety standards and anticipated regulatory requirements within the United States.

**6.13.4 Reviewed by O & T, No comments**

At one ATA carrier, the SMS program itself has driven a small increase in resource requirements, but the deployment of the supporting elements of the SMS drive additional resource commitments. As a continuous improvement program, it is envisioned as constantly evolving and remaining flexible in scope, direction and resources.

Another larger carrier added nine Full Time Equivalents (FTE) to its safety organization in order to maintain five Aviation Safety Action Programs and a FOQA Program, and to implement its SMS initiative. However, this is not expected to be sufficient to manage SMS for the long-term.

A third carrier added personnel to its payroll to enhance ATOS, CASS, AQP, ASAP and FOQA – which are viewed as ultimately parts of its SMS, once completely established. AQD, a vendor Airline Quality Database, was also purchased as the data collection tool of choice. This airline cannot yet estimate how many additional FTE, if any, will be needed once a mature SMS is in place. [51.1]

**Reviewed by O & T, No comments all pertinent information.**



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From the Association of Flight Attendants – CWA (AFA): Not applicable in general, although AFA does provide a staff member who assists and supports local employee groups in the development and implementation of ASAPs. We expect to provide similar or greater levels of involvement in developing and implementing SMS programs. [59.1]

**Reviewed by O & T, No comments**

- 6.13.5 From the Air Medical Operators Association (AMOA): AMOA believes that the primary impact to the organization originates in the extra personnel hours needed to establish and maintain the system. As the SMS system matures and becomes more integrated into an organization's structure, those maintenance requirements for the system will diminish. In many ways, the SMS structure has greatly improved our member's safety programs as they are able to track and remedy issues more efficiently, increasingly the overall efficiency of their organizations. [52.1]

**Reviewed by O & T, No comments**

- 6.13.6 From Delta Airlines, Inc: Delta recognized early on; that the success of the program was tied to having a program manager at the corporate level and at the various divisional levels to oversee the implementation. We have made an investment in those resources. [56.1]

**Reviewed by O & T, No comments**

- 6.13.7 From Virgin America Airlines: SMS has not had a significant impact on the resources (again, primarily staffing) necessary to implement and maintain the system. [40.1]

**Reviewed by O & T, No comments**

- 6.13.8 From Ameriflight, LLC: Not known at this time. It will vary widely depending upon the size and complexity of the operation, and the extent to which SMS will be applied in the company: Applicable only to flight operations and maintenance, or applied company wide including office personnel, for example? In our own operation, it will likely involve one or two full-time-equivalent management level employees, with reporting and auditing responsibilities spread out through lower echelons. [2.1]

**Reviewed by O & T, No comments**

- 6.13.9 From Jet Logistics, Inc.: Minimal costs to maintain. Printing costs about \$3/ SMS manual. Develop a PowerPoint program for training purposes 10-15 hours (Director of Safety). [6.1]

**Reviewed by O & T, No comments**

- 6.13.10 From Miami Air International: Development and training are ongoing processes. [11.1]

**Reviewed by O & T, No comments**

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6.13.11 From the Aviation Safety Council of Alaska (ASCA): In general, additional resources and staff will be required for data collection, internal audits and evaluations, and to monitor all processes and procedures as answered in question 9. [71.1]

**Reviewed by O & T, No comments**

6.13.12 From Aero Micronesia, Inc. d/b/a Asia Pacific Airlines: The impact of aligning our company with ATOS has been huge. Our company is typical of many small air carriers certificated more than ten years ago. Maintenance planning and recordkeeping employ manual systems. Most of the company manuals were developed using “cut and paste” information from other carriers and updating the company manual system is difficult. Further, the concept of “system safety” is not easily understood by key staff persons familiar with the non-ATOS FAA surveillance environment. It is a steep learning curve to understand how process measurements, controls, etc. can be implemented for systems that were not designed in this fashion. We are constantly engaged in addressing FAA concerns from Element Performance Inspections (EPI) that cite the deficiencies in the design of our management and information systems. Our only remedy has been a Herculean effort to revise manuals and training programs to satisfy the elements of the various ATOS Data Collection Tools (DCT). Since the subject matter and depth of evaluation represented by the DCT is extensive, the impact upon our small staff has been costly and extremely burdensome. It could be argued that our attentiveness to ATOS requirements in recent months has diminished our capability to effectively manage our day-to-day operation. The FAA needs to include in their SMS rulemaking a reasonable timeline for implementation. They should also address the design of an air carrier’s SMS before evaluating the carrier’s performance under their SMS. To evaluate both simultaneously which is often the case in ATOS with Safety Attribute Inspections being conducted along with Element Performance Inspections is self defeating. While all Part 121 air carriers were declared to be under ATOS to meet a Congressional mandate, the actual incorporation of the ATOS system safety principles into the management processes of many carriers is continuing and varies with size of the carrier and the work program of the certificate holding office. [65]

***NOTE:** Reviewed by O & T – The SMS compliance process should not be so overwhelming that the airline, or other operators lose control of the oversight of their day-to-day operations. The intent of SMS is to monitor the day-to-day operations, not at the expense of those operations.*

6.13.13 From Chantilly Air, Inc: Since initial development, Chantilly Air, Inc's SMS activities are coordinated by a part-time dedicated Safety Coordinator position. Additional employee time (for safety committee activities, internal audits, and implementation of corrective actions) is absorbed as part of employees' normal duties, but that additional employee time is included in the imputed development and maintenance cost in Question 9, above. [81.1]

**Reviewed by O & T, No comments**

6.13.14 From Frontier Alaska: In general, additional resources and staff will be required for data collection, internal audits and evaluations, and to monitor all processes and procedures as answered in question 9. [67.1]

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**Reviewed by O & T, No comments**

6.13.15 Other Comments

- A. From Bombardier Aerospace: Based on internal experience the following additional resources have been required:
- Establishment of a Safety Office with a dedicated team to develop the system, lead the deployment of SMS and continued oversight.
  - Dedicated SMS analysts for each site/functional certificate for day to day management of the reporting and corrective action systems.
  - Throughout various phases of SMS development and deployment various employees and specialists will be called upon to participate in these activities on a temporary basis.

Particular Experience of Flexjet

SMS is a continuous process and a valuable tool in identifying hazards and risks. It is also a mechanism for the development and implementation of corrective actions to mitigate those risks. SMS is a sound roadmap to improve overall safety performance. Since adopting SMS as a process it has proven to be effective in educating the entire employee workforce with respect to safety and safe practices. [44.2]

**Reviewed by O & T, No comments**

- B. HEICO Aerospace: Performing audit of engineering procedures and quality audits to the requirements of the COS program was critical to the success of the program. [85.1]

**Reviewed by O & T, No comments**

- C. Northern Air Cargo: In general, additional resources and staff will be required for data collection, internal audits and evaluations, and to monitor all processes and procedures as answered in question 9. [73.1]

**Reviewed by O & T, No comments**

6.14 Question 11

What new knowledge, skills, and abilities would your organization need, if any, to operate successfully within an SMS?

- 6.14.1 From The Transport Workers Union of America, AFL-CIO (TWU): Personnel training programs should be made available to TWU members to ensure that our membership fully understands the principles and purposes of an SMS. [47.1]

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**NOTE:** Agree generic SMS training should be available to all employees. Initial high-level introduction should be provided to all employees (could be one hour or less, may be included as part of indoctrination). More comprehensive training should be provided to safety practitioners, as applicable to specific work assignments.

- 6.14.2 From the Air Transport Association of America, Inc. (ATA): The organization would need to undergo a transformation to embrace SMS. Processes in place to collect, share and analyze data would need to be re-cast as components of the SMS. A safety culture, optimally a “just culture,” would need to be established, and all employees would need to develop trust and confidence in the appropriate use of safety and enterprise improvement reports. A “critical mass” of SMS facilitators would need to be grown at every level of the organization. Top-down empowerment and feedback would be critical. Meritocracy would replace any vestiges of a “good old boy” network.

In order for ATA’s airlines to transition from current risk mitigation/safety assurance operations into a fully integrated SMS, it is imperative that communication be constant between the groups tasked with formulating regulation and those on which it will be imposed. The information-sharing opportunities (such as the SMS Focus Group) need to continue to occur so that any issues, questions, or lessons learned can be shared in an open forum. At one ATA carrier, the required knowledge, skill, and ability base is currently in place with select individuals in its organization.

Communication, fairness, consistency, and accuracy will be at a premium, especially at the Line Manager level, where Safety Action Teams generate a host of mitigation initiatives. Early small successes will be essential to getting SMS off to a good start. Feedback to the workforce will, once again, be essential.

Many air carriers are very strong in the areas of Safety Policy and Safety Promotion. They are assessing strengths in the areas of Safety Risk Management and Safety Assurance, but are likely to need additional knowledge and skills in those areas. Possibly the most important skill for air carriers to master is effective data analysis leading to appropriate risk management. This will be game-changing when fully operational; it is currently not, however, a common skill set.

Personnel training on SMS and the elements associated with this system must be conducted with all involved participants (this should include FAA training that CMO personnel attend). A complete and identical understanding of the regulation from both FAA and operator perspectives is imperative to enable the transition process. The internal task is to provide and educate a small group of individuals with an in depth knowledge of the SMS and a large group with familiarization training and skills.

With the unique characteristics of each SMS, each air carrier must anticipate the need to produce training and materials internally. Internal training on functionality and conduct of SMS activities are part of the Pilot Project activities. It is imperative that SMS guidance reflect today’s current and relevant training well into the future. The necessity for re-training would potentially dilute the importance of the SMS message.

Carriers will implement new software technologies requiring development and training time, as well as program management expertise. Existing programs applied outside the

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flight deck (Ground LOSA, Threat and Error Management, etc.) will eventually be expanded and supplemented with new programs.

Each participant must gain the confidence and ability to follow the SMS roadmap and reach consensus. This comes from positive experience in being part of the solution-sharing process. Good SMS participants appreciate the integrity of the process and resist the temptation to “solve world hunger.” It’s far better to make small, steady progress rather than suffer failure by taking on an issue far too large and complex for the Safety Action Team to solve. [51.1]

**NOTE:** *Agree - Overview training for all employees. Small group of individuals directly involved in safety processes require more in-depth training. Guidance material that accompanies initial rule needs to address various levels, and be customizable. effective data analysis and provide and educate a small group of individuals with an in depth knowledge of the SMS and a large group with familiarization training and skills.*

6.14.3 From the Allied Pilots Association (APA): SMS requires a commitment at all levels to incorporate and continually improve safety in all aspects of airline operations. This is not just another “quality” program or another stand-alone system. The SMS approach to evaluating and mitigating risk requires an attitudinal change, which establishes and promotes a safety culture within the organization. This will require training at all levels. Line employees as well as all members of management, including the CEO, must be trained on the philosophy, expectations and processes of a properly executed SMS. Without that common understanding, SMS will not achieve its full potential. [76.1]

**NOTE:** *Agree - Two aspects of training: 1. SMS concepts and principles. 2. Specific SMS implementation at the organization. Will require training at all levels.*

6.14.4 From the Association of Flight Attendants – CWA (AFA): As an organization that represents line flight attendants, we expect that our support staff and local members will require new, appropriate education and training tools to fully understand and support implementation of SMS programs. [59.1]

### **Employee training**

6.14.5 From the Air Medical Operators Association (AMOA): Even with a robust SMS process, opportunities exist to improve the knowledge, skills, and abilities to effectively implement or improve SMS throughout the organization. An effective SMS depends heavily on hazard identification and good communications. Training focused on improving these two skills would be beneficial to any organization to implement/improve their SMS.

Once an SMS is developed into policy, each manager and safety rep is trained on the system to ensure a proper level of knowledge and understanding of the SMS. No new skills or abilities have been identified that would facilitate this process.

As previously mentioned, the success of any SMS will be contingent on the level of competency of the individual responsible for developing, implementing, managing, and sustaining the SMS. Given the magnitude and scope of this requirement, it will be understandably difficult for smaller operators to resource the requisite personnel and

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system elements without low-cost and fully developed examples, formats, templates, and solutions readily available for their use. [52.1]

**NOTE:** Agree - Employee training on: 1. SMS concepts and principles. 2. Specific SMS implementation at the organization.

- 6.14.6 From Delta Airlines, Inc: Once the system reaches its mature stages, the role of an operational divisional program manager would involve a more advanced skill set requiring proactive unique qualifications which an air carrier would have not required for a Level 1 or Level 2.

Unique skill sets would have to go beyond traditional reactive approach such as; the requirement to be a data analytical expert, understanding of the data, overall knowledge of the operation, practical experience, good communication skills, subject matter expert in all areas and interface areas, highly analytical, and deep intellectual abilities. As an air carrier demonstrating the need to implement an effective SMS, we believe it is essential to develop these specific skills in an employee. Handling the higher levels of statistical data analysis and operational practical experience is a growth advancement requiring exceptional resources and higher standards of revenue and time. [56.1]

**Training requirements based on employee participation in SMS processes.**

- 6.14.7 From Virgin America Airlines: Several management employees in safety-related positions have attended the SMS course developed by MITRE in conjunction with the FAA. No additional knowledge, skills, or abilities are necessary to operate successfully within our SMS at this time. FAA guidebooks and training material would be welcome. [40.1]

**FAA guidance necessary.**

- 6.14.8 From Ameriflight, LLC: Aside from training to educate participants in SMS, probably nothing significant. [2.1]

**training**

- 6.14.9 From Jet Logistics, Inc.:

Knowledge terminology, method of reporting

Skills none

Abilities read and write [6.1]

**No comment...**

- 6.14.10 From Miami Air International: The development of a new **Safety Culture has to be developed**, this takes time, and personnel will have to be properly trained. At first employees will be reluctant to buy into the system; you only have one time to make a first impression, so you better get it right. [11.1]

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## Personnel training - safety culture development

- 6.14.11 From the Aviation Safety Council of Alaska (ASCA): Management & Administration: Executive management and administration must understand disciplines like system improvement processes (American Society for Quality), quality improvement (ASQ), auditing (ASQ), system safety (FAA), change management (ASQ) and process improvement (Kaizen).

**A data gathering and tracking system will need to be connected** to the fabric of day to day activities for tracking progress and shortfalls. Management will need to understand how to implement a SMS process and be provided tools to measure performance of the SMS system.

Operational Groups: Need to embrace and cope with change from various sources by implementing soft skill training sessions. This group provides data that can be handled through SMS processes. They will need access to and training on the **SMS data collection process**.

Support Groups / Vendors: This group will need to understand how they are an integral part of the user/operational group's success with SMS practices. This group will also need safety systems training as well as SMS for applicable vendors. Vendors of primary aircraft components would be the first sectors of the industry to target to encourage development of SMS in the business they conduct (manufacturers of engines, airframes propellers, avionics, etc...). [71.1]

**NOTE:** *FAA guidance will need to be developed to provide applicable examples of scalable data collection and performance measuring activities.*

- 6.14.12 From Aero Micronesia, Inc. d/b/a Asia Pacific Airlines: The degree of success of any air carrier implementing an SMS will depend upon the sophistication of its staff with respect to system safety. Our experience suggests that adding an SMS to the present ATOS will create a mix that demands having additional personnel resources available who are trained in one or more disciplines such as system safety, systems management, system engineering, quality management systems, operations research, etc. Implementation of a mandatory SMS within an airline could give rise to a whole new level of management sophistication where the services of college trained, internal or external auditors and evaluators will be essential for survival in the regulatory environment. [65]

**NOTE:** *Should be able to integrate SMS with existing safety programs - thus new level of mgt sophistication should not be required.*

- 6.14.13 From Chantilly Air, Inc: While Chantilly Air, Inc. recognizes that development of an SMS is an ongoing learning process, we believe that, since initial development of an SMS, we have acquired the necessary knowledge to operate within an SMS. We feel that it is important for FAA to convey the message that implementation and management of an SMS is, at its core, a very simple activity. Future FAA guidance in this area should reflect that message. In this sense, Chantilly Air, Inc. asks FAA to consider revisiting AC 120-79 which, as currently written, does this message of simplicity disservice. We would ask

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FAA for less high-level discussion, **and more concrete guidance**, from a re-written Advisory Circular. [81.1]

**Need more concrete guidance (Advisory Circular)**

6.14.14 From Frontier Alaska: Management & Administration: Executive management and administration must understand disciplines like system improvement processes (American Society for Quality), quality improvement (ASQ), auditing (ASQ), system safety (FAA), change management (ASQ) and process improvement (Kaizen).

**A data gathering and tracking system** will need to be connected to the fabric of day to day activities for tracking progress and shortfalls. Management will need to understand how to implement a SMS process and be provided tools to measure performance of the SMS system.

Operational Groups: Need to embrace and cope with change from various sources by implementing soft skill training sessions. This group provides data that can be handled through SMS processes. They will need access to and training on the SMS data collection process.

Support Groups / Vendors: This group will need to understand how they are an integral part of the user/operational group's success with SMS practices. This group will also need safety systems training as well as SMS for applicable vendors. Vendors of primary aircraft components would be the first sectors of the industry to target to encourage development of SMS in the business they conduct (manufacturers of engines, airframes propellers, avionics, etc...). [67.1]

**Same as ASCA**

6.14.15 Other Comments

A. From Bombardier Aerospace: Bombardier Aerospace will not require any new knowledge, skills or ability to operate successfully a SMS program.

Also particular knowledge may be required regarding "how to" implement SMS. Training material is available through the internet and several training seminars and courses are available on this subject to facilitate this process. Also, access to information on the implementation of SMS in other similar organizations, access to SMS specialists and the use of common templates all simplify the requisite learning and timely execution of SMS. [44.2]

B. HEICO Aerospace: As noted above the Technical Operations organization developed was required to work with the Business Units and train personnel to the COS system. We would need to expand applicable requirements to insure SMS compliance. [85.1]

C. Northern Air Cargo: Management & Administration: Executive management and administration must understand disciplines like system improvement processes (American Society for Quality), quality improvement (ASQ), auditing (ASQ), system safety (FAA), change management (ASQ) and process improvement (Kaizen).



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A data gathering and tracking system will need to be connected to the fabric of day to day activities for tracking progress and shortfalls. Management will need to understand how to implement a SMS process and be provided tools to measure performance of the SMS system.

Operational Groups: Need to embrace and cope with change from various sources by implementing soft skill training sessions. This group provides data that can be handled through SMS processes. They will need access to and training on the SMS data collection process.

Support Groups / Vendors: This group will need to understand how they are an integral part of the user/operational group's success with SMS practices. This group will also need safety systems training as well as SMS for applicable vendors. Vendors of primary aircraft components would be the first sectors of the industry to target to encourage development of SMS in the business they conduct (manufacturers of engines, airframes propellers, avionics, etc...). [73.1]

## 6.15 Question 12

Please give us your thoughts about the current processes for procuring and using voluntarily submitted safety data through FAA programs such as Aviation Safety Action Program (ASAP) and how these programs would fit within an SMS framework.

6.15.1 From The Transport Workers Union of America, AFL-CIO (TWU): TWU believes that the ASAP data is critical to understanding and proactively addressing safety concerns. With respect to Dispatchers specifically, TWU believes the effectiveness of ASAP to the individual Dispatcher has yet to be fully felt. Over time, however, the programs ability to effectively identify threats and provide tools to mitigate errors will continue to improve. With respect to Flight Attendants that TWU represents, we have been working hand-in-hand with management to ensure that the program will protect Flight Attendants who report unintentional noncompliance. The systems will be enhanced further by ensuring that data protection and sensitivity could carry over into an SMS, particularly if industry-sharing of SMS data is a requirement for a carrier. [47.1]

### **Data protection (concern for mandatory reporting)**

6.15.2 From the Air Transport Association of America, Inc. (ATA): Programs such as ASAP and FOQA provide insight into the cohesiveness of the operation as a whole and provide an opportunity to proactively address safety concerns. If information sharing in SMS were to follow the same protocol, data protection (on an individual and operator basis) would be vital. ATA would require more definition of how data within an SMS system would be collected, stored and disseminated amongst other operators. Again, sharing of safety information in a proactive manner is extremely important, but most operators express concern about how their data will be shared. Would sharing of information across SMS interfaces be voluntary?

ATA airlines possess a healthy safety reporting culture and front line/leadership relationship that greatly aid the procurement and use of voluntarily submitted safety data. The current guidance tailored for specific voluntary safety reporting programs like ASAP

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lacks the necessary clarity to be applied consistently across various other sectors of the industry. On the other hand, broad guidance material, while allowing greater flexibility for a variety of organizations, can also detract from the parity and quality of mutually supportive programs, leading to potential conflicts. SMS should facilitate clear, unambiguous communication between voluntary safety programs and promote consistency.

ASAP programs build trust and confidence between an air carrier and its employees; before ASAP, the only recourse was company discipline and FAA enforcement action (civil penalty fine, license suspension, and license revocation). The enforcement incentive afforded by ASAP allows an employee to "get the monkey off his back," and make a clean start. It is not a blame game. It sets the stage for continuous improvement. ASAP gives the employee a voice in helping to ensure a better level of safety in their workplace in a non-threatening manner. ASAP engages employees in everyday safety awareness to further engrain the safety mindset by encouraging a proactive versus reactive nature to the program. ASAP helps protect jobs by reducing accidents and injuries and supports employee morale. In promoting FOQA and ASAP programs throughout the industry, FAA should re-establish the "DemoProj" initiative used in the 1990s and early 2000s, this time targeting the regional airlines to provide seed money to establish FOQA programs among operators that currently lag in development. DemoProj was very successful in supplementing the initial investment in development of FOQA programs at the major carriers.

ASAP reports are generally candid and honest. A reporter often does the best job of analyzing his or her own mistakes and identifying plausible corrective action. The feedback from de-identified reports helps other employees avert the same mistakes. ASAP is the first step toward a just culture. In a just culture, company management and employees work together to perform in a safe manner. Simple human error and even "at risk" behaviors can be corrected in a non-punitive manner. Only a very few individuals who consciously disregard a substantial and unjustifiable risk are denied inclusion in ASAP.

Thousands of corrective actions have emanated from over 200 Part 121 ASAPs at 70 commercial air carriers, and most recently, unscheduled Part 135 operators, including Emergency Medical Services. ASAP contributions have provided over 80,000 Part 121 reports to the NASA Aviation Safety Reporting System database to augment reports received from Part 91 and Part 135 sectors of the industry. These reports help shape change in the National Airspace System.

Flight Operations, Dispatch, Maintenance, Onboard, and even Ground Support or Stations ASAPs constantly generate reports to help keep the aviation safety system robust and healthy, despite economic downturns that have cost the industry over \$45B in the last 5 years alone.

FAA never appreciated what they did not know until they sat in on FOQA, ASAP, and AQP sessions. We hear at semi-annual "infoshare" meetings that the volume of "sole source" reports is anywhere from 50% to 90% of total ASAP reports, depending upon the type and maturity of the program. This represents "actionable intelligence" that both the regulator and the operator never had before - and it can be used to correct deficiencies

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before they become accidents. ASAP, FOQA and CASS programs are fairly robust and getting stronger as airlines learn how to leverage those processes to focus management efforts. These programs are an integral part of the Safety Assurance component of an SMS.

The current unprecedented safety record of the commercial airline industry can be attributed both to the implementation of Commercial Aviation Safety Team safety enhancements and the tremendous knowledge gained over the past 15 years from voluntary safety reporting programs like ASAP and Flight Operational Quality Assurance (FOQA). These are important elements of a future Safety Management System. SMS will change the paradigm of safety from ponderous oversight, reactive investigation when accidents occur, and subsequent prescriptive rulemaking, to an atmosphere where hazards are promptly identified, risk is assessed, mitigations are emplaced, and mitigation effectiveness is constantly measured.

- 6.15.3 The data gleaned from voluntary safety programs are an essential element of an effective SMS. These programs have been essential in gathering crucial safety data, create a positive safety culture, and need to be expanded. As noted in response to Question 8 (above), reasonable assurances need to be given that the information will not be used to the detriment of the individual / organization, lest the effectiveness of the programs suffer. The mandating of FOQA and ASAP would eliminate the partnership aspects of these programs, requiring airlines to operate them without employee involvement as a federal requirement tied to the carrier's Operations Specifications. This would in turn change the balance of participation and inhibit the reporting and safety culture of the airline, nullifying the underlying original intent. Voluntary ASAPs encourage safety culture change, necessarily dependent upon committed, sustained leadership, as well as a grassroots belief in the ability to change the culture for the better. [51.1]

**NOTE:** FAA should re-establish the "DemoProj" initiative! Voluntary reporting programs are vital. ASAP is seen as an important tool. Concern w/ data protection if ASAP becomes mandatory. Could realistically mandate ASAP for 121's. MOU issue might prevent universal application. Company EVRS may be satisfactory in some environments. ASAP is a model (require a scalable method to acquire voluntary data).

- 6.15.4 From Air Line Pilots Association, International (ALPA): Voluntary safety reporting programs are an essential element of any SMS. An organization's management can talk about having a safety program, assess risk and implement mitigations, and take other steps to introduce safety into daily operations. However, the real test of the efficacy of these steps occurs on the front line of the organization. Front line personnel can see if safety is really present and report on successes or failures. There remains an historic belief within many aviation industry employers that the threat of punishment somehow encourages safe operations within an organization; nothing could be further from the truth. An organization's safety culture can be measured by the confidence that the front-line employees have in the safety reporting system within the organization.

This key element of a safety culture can only be achieved with clear procedures of information handling by the employer and the regulator and the reporting employee must understand these procedures and policies. More formal safety reporting programs such as the Aviation Safety Action Program (ASAP) can provide safety data in a structured and

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consistent manner. Merely collecting data is not enough; the data has to be routinely reviewed and used as a basis for gauging and improving organizational safety. Since the purpose of voluntary safety programs is to improve safety, the data has to be collected in a manner that encourages participation and protects reporters. As soon as employees see punitive action taken against reporters, this important source of safety information will cease.

SMS programs must encourage uninhibited, voluntary reporting of perceived safety risks, either through ASAP or other formal reporting programs and employee reporting. Employers must refrain from arbitrary punitive action against reporters. In addition, reporting employees must be protected from any punitive action brought by the regulator, employers, or through civil proceedings.

Congress is advocating strong support for voluntary safety reporting programs, including ASAP and flight operational quality assurance programs (FOQA). In fact, in the House's consideration of the Airline Safety and Pilot Training Improvement Act of 2009, they call for FAA rulemaking on SMS which will consider, at a minimum, ASAP and FOQA. The FAA should require that information and safety data gathered through any voluntary safety programs will be protected and used only for aviation safety improvement, not enforcement, litigation, or other punitive actions. If the FAA cannot protect this data, then further Congressional action needs to be taken to assure the protection and integrity of safety data. [69.1]

#### **Similar to ATA**

- 6.15.5 From the Allied Pilots Association (APA): ASAP and FOQA are excellent tools in collecting safety data and are key components of an SMS system. However, the success of all safety programs is predicated on two principles: 1) Having adequate resources available to analyze collected data; and 2) A viable mechanism that can evaluate and implement changes based on the analysis of the safety data to eliminate safety hazards. Additionally, the strength of these programs is directly tied to the security and confidentiality of information obtained from all participants. Legal protections must be in place to prevent the release of confidential safety data for inappropriate use. Improper release of safety data will quickly result in reduced voluntary reporting by participants. [76.1]

#### **Beyond data collection, the org must have methods for data analysis and action. Legal protections!**

- 6.15.6 From the Association of Flight Attendants – CWA (AFA): The AFA has seen in the three ASAPs with which we are currently involved data are collected electronically and on paper – both methods have been equally effective. As these programs have matured, the levels of reporting have increased. Cooperation between and among the FAA, employee representatives and management is critical to successful procurement and use of the data. [59.1]

**Agree.**

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6.15.7 From the Air Medical Operators Association (AMOA): AMOA believes that the quality of data collected is directly proportional to the trust and confidence that industry participants have in the collection agency. We believe that regulated organizations will be more apt to comply with voluntary collection if they believe the sensitive and proprietary nature of the information will be protected. We further believe that all of the current voluntary ASAP safety programs should be incorporated into the SMS framework to ensure a robust safety system and uniform application of SMS principles. [52.1]

**Agree.**

6.15.8 From Virgin America Airlines: Several management employees in safety-related positions have attended the SMS course developed by MITRE in conjunction with the FAA. No additional knowledge, skills, or abilities are necessary to operate successfully within our SMS at this time. FAA guidebooks and training material would be welcome. [40.1]

6.15.9 From Delta Airlines, Inc: ASAP, FOQA, and or other non-punitive reporting programs are vital to the effectiveness of air carriers SMS, however we are **concerned about the data and its protection consistent with the existing MOU's**.

The inconsistency is prevalent in the following areas a) transferring data, b) following the data, and c) maintaining the integrity of the data for use in analysis and risk assessment. The data protection currently does not exist within the framework of the SMS. A need for a comprehensive strategy to protect data by the MOU and all other company issued non-punitive reporting programs is imperative to a successful SMS. [56.1]

**NOTE:** *Need Data protection.*

6.15.10 From the National Transportation Safety Board: The NTSB considers programs such as ASAP and the Flight Operational Quality Assurance (FOQA) program to be fundamental tools for operators to realize the safety assurance component of SMS programs. The NTSP has had a longstanding interest in programs such as ASAP and FOQA and has issued safety recommendations encouraging the adoption of these programs. [27.1]

**Agree.**

6.15.11 From Ameriflight, LLC: We do not participate in an ASAP program, although we do periodically make use of the Voluntary Self Disclosure Reporting system, and voluntarily submit data via Malfunction or Defect reports, Mechanical Reliability Reports, etc. A significant concern is **effective flow from FAA of reports arising from such sources back** to industry participants. [2.1]

**NOTE:** *Need to formalize process to feedback information from reporting to affected industry entities. Will FAA provide national-level data integration/ distribution? What about int'l?*

6.15.12 From SMS4Aviation, LLC: Our company has attempted to convince operators that they should develop an ASAP type program that provides for a non-punitive reporting system. Many of the part 91 operators we work with are reluctant to notify regulatory agencies in the event of a mistake. We believe it's essential to improve aviation safety and one of the best ways to do that is by sharing mistakes openly. In terms of integrating the ASAP into

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the SMS, we suspect that will take time, but it is a very important component to the SMS, and the company must attempt to use it fully. [3.1]

#### **Internal company EVRS**

6.15.13 From Jet Logistics, Inc.: Programs in the past, such as ASAP, have done a good job of detecting issues that HAPPENED. By detecting issues in the past we can hopefully make corrections, adjustments, etc, so that these issues are avoided in the future. However, SMS is the first program that when properly developed and implemented, will be proactive and even predictive at avoiding the potential issues in the first place. Programs in the past are like the Cockpit Voice Recorder. No CVR has ever saved a life in the plane that crashed, but the information on the CVR tapes help to protect people on future flights. Yet SMS will help to save lives before any life has to be lost. It is the first program that we've seen that can, and does, accomplish this goal. The data saved by this process helps to improve this process. Data from any other program should serve to improve operations as well, but only through an SMS do we achieve a proactive situation. [6.1]

#### **Agree re shift from forensic / reactive to proactive / predictive**

6.15.14 From Miami Air International: As stated in Question 2c we have the CASS, ASAP, FOQA, VDRP, and IEP programs. These programs will become the foundation of our SMS program. [11.1]

From the Aviation Safety Council of Alaska (ASCA): Integrating data between ASAP, FOQA, ASRS and SMS is not practical. Controls associated with those programs are too complex for what would be needed for SMS. [71.1]]

**NOTE:** *Should be able to share / integrate various information sources (SMS should facilitate this.)*

6.15.15 From Aero Micronesia, Inc. d/b/a Asia Pacific Airlines: The voluntary submission of safety data through FAA programs such as the Aviation Safety Action Program (ASAP) has been invaluable in identifying risk and potential hazards. Such programs should be core requirements of any proposed SMS. [65]

#### **Agree**

6.15.16 From Frontier Alaska: The current method of submitting voluntary information through ASAP has been working well within the State of Alaska because of the involvement of the Medallion Foundation as the administrator of that program. The overall concept of ASAP has been most successful when the intentions of the MOU are followed and information is protected as stated. The same would be true for any safety reporting system included in an SMS, employees will not participate if they feel threatened or retaliated against when bringing safety concerns to management. The employee inputs will become unavailable. Using a similar process for hazard reporting and ASAP reporting is recommended, with the company safety department serving as the pseudo ERC to validate and investigate concerns with the input and collaborative efforts of applicable parties. [67.1]

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## Internal company EVRS (including internal ERC-type review)

### 6.15.17 Other Comments

#### A. From Bombardier Aerospace: Positive Experience Using ASAP and /or Internal Self Disclosure Programs:

- Tucson BSC - Incorporating existing programs such as ASAP or Self Disclosure regarding safety provides a positive approach to safety. These programs promote a safe work environment and establish safety as a top priority throughout the organization by encouraging the sharing of information without risk of reprisal.
- Flexjet - The focus of SMS is the collection of data and analysis from submitted reports through the AS. The analysis of this data is providing a positive impact on safety awareness within the organization. Although these changes are not always apparent to the employee they do exist and have reduced recurrence of similar events. Summary of events and corrective action plans are disseminated back to the entire workforce through company communication processes
- Learjet - System of Airports Reporting (SOAR) has been adopted by Learjet. Flight crews understand that reporting through this system is non-punitive and are more willing to share their experiences. This information in turn benefits others through lessons learned from those experiences. This program functions very satisfactorily and is expected to fit within the constraints of a SMS.
- Bombardier Employee Voluntary Safety Reporting System (SRS) - This program works well for collecting and disseminating safety related data and is particularly successful due in part to non-punitive protections for the employees. The lessons learned from this program are shared with other areas of the organization thereby minimizing repeat similar occurrences elsewhere. [44.2]

#### B. Northern Air Cargo: Integrating data between ASAP, FOQA, ASRS and SMS is not practical. Controls associated with those programs are too complex for what would be needed for SMS. [73.1]

### 6.16 Question 13

What areas of current regulations do you believe already incorporate SMS principles (e.g., continuing analysis and surveillance system (CASS) under 14 CFR 121.373; quality or inspection system requirements under 14 CFR 21.143 and 21.303)? How would you suggest the FAA avoid any duplicative requirements in any SMS rulemaking effort?

- 6.16.1 From The Transport Workers Union of America, AFL-CIO (TWU): TWU is concerned that the FAA does not have a plan to incorporate SMS principles within mandatory analysis or audit systems. The requirement to keep these programs (SMS and CASS) independent, while removing any supporting functionality, prevents accurate trending and tracking. Accurate trending and tracking are crucial to understanding the impact that each process has on other processes within the system. For example, the FAA mandate that

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requires carriers to self-disclose any event that has been identified by a sole-source ASAP may suggest that complete harmonization is not a key element of a robust SMS. [47.1]

### **Reviewed**

- 6.16.2 From the Air Transport Association of America, Inc. (ATA): The stated goal of the Continuing Analysis and Surveillance System (CASS) is to “evaluate, analyze, and correct the deficiencies in the performance and effectiveness of their inspection and maintenance programs.” Publication DOT/FAA/AR-03/70 outlines recommended components of large and medium Part 121 air carrier CASS programs. It describes sources of data, controls, risk analysis (including root cause analysis), and corrective action.

The Part 121 CASS data analysis process flowchart is easily adaptable to the Safety Management Systems concept. While there may be some potential for duplicative efforts between what is regulated for CASS, it is clear that current guidelines for SMS regulation must apply to the entire organization. CASS under 14CFR 121.373 lends itself to adopting SMS principles, because an effective Continuing Analysis and Surveillance System (CASS) follows an SMS rationale of continuous improvement. In order for the SMS to be effective, it is imperative that the concepts and terminology within systems such as CASS be standardized and applicable to all employees, regardless of function within the operation.

There are presently no regulations that fully incorporate SMS principles. Some have resemblances to an SMS, but lack the complete rationale and principles. It is extremely difficult for a regulatory agency to adopt SMS with the current compliance mindset/mission. ATOS is the most malleable, but it is not regulatory. Other voluntary safety programs include some recognizable SMS principles, but the significant difference lies in the holistic and higher level SMS approach to safety. This approach leads to a question of the need for modified guidance in the SMS rulemaking effort for the voluntary programs that have existing comprehensive guidance. CASS, ASAP and FOQA must be integrated early into SMS. While there are other important data streams that must also be incorporated for an SMS to have the robustness required, these three programs are widely accepted and relied upon by many operators. In the future, Fatigue Risk Management Systems should also fall under an operator’s SMS program. The goal of SMS is to ensure the individual programs properly interface.

Any rulemaking should include an assessment of the effect on established rules and guidance material. Due to the scope of SMS and the potential influence on other established requirements and/or programs, such impact must be considered during rulemaking. In order to avoid duplicative requirements in any SMS rulemaking effort, the FAA should conduct a comparative review of the elements in the proposed SMS rule against the existing population of active regulations. Duplications should be reviewed with the industry in a future Notice of Proposed Rulemaking process to gain consensus for retention in the SMS rule. SMS rulemaking participants need to ensure no conflicting regulations are developed or retained. The SMS for airports must be compatible with other aviation service providers, such as airlines, OEMs, MROs, technical training institutions, etc.



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At a Maintenance ASAP working session at the recent Chicago “infoshare” meeting hosted by Mitre Corporation, September 22nd-24th, 2009, industry participants lamented the current “stovepipe” nature of safety and reliability programs like VDRP, ATOS, CASS, MRRB, SDR, QA, etc. Complaints included the following observations:

- Some Certificate Management Offices (CMOs) play one program off another. For example, some events are re-identified anecdotally. When an ASAP report triggers a Voluntary Disclosure Reporting Program (VDRP) report, the latter may not be accepted, etc.
- Some CMOs insist on a 10 working day limit on a final VDRP report, even though the complexity that led up to the event does not lend itself to a “comprehensive fix” in such a short timeframe.
- ASAP should lead the investigation of an event, rather than be comingled with three or four other separate investigations (e.g., VDRP report, FAA Enforcement Investigative Report (EIR), Service Difficulty Report (SDR), company legal/disciplinary investigation).
- There should be a consistent approach within the regulator; at present, some Aviation Safety Inspectors (ASIs) will still issue a Letter of Investigation (LOI) despite being informed that an ASAP report was filed.
- Maintenance ASAP Event Review Committees are often informed by the regulator’s ASIs that they will not accept an ASAP report resulting from audits “in process.”
- Results of FAA AFS-230 audits have sometimes not produced policy changes in ASAP. A pervasive trigger for many VDRPs resulting from maintenance ASAP reports is the concept of “the aircraft moved,” therefore the assumption was that there was a “systemic deficiency.”
- The handling of repeat reports of same, or similar, events is poorly defined. Should they be dealt with in an SMS inclusive fashion? In other words (with a view toward continuous improvement) if the corrective action was ineffective, should it be reinforced with improved mitigation(s), or should the report be excluded from ASAP and perhaps be lost from SMS scrutiny? [51.1]

***NOTE:** Need more holistic, integrated approach to safety risk management at the operator (to include or integrate various programs). FAA oversight model needs to accommodate this. Could potentially eliminate redundant programs that are subsumed into the organization’s SMS.*

- 6.16.3 From the Air Medical Operators Association (AMOA): SMS elements are already required in 14 CFR in Parts 119 and 135 (e.g., CASS, Operational Control, accountable management personnel, tasks and responsibilities, etc). Any comprehensive regulatory language in reference to SMS framework and implementation should be clearly defined and cross-referenced to existing SMS elements in other CFR sections to promote consistency and avoid unnecessary duplication. **Additionally, a review of the current regulations relative to CASS and ATOS will determine how much of the regulations in question would integrate with the SMS as outlined in the current guidance. [52.1]**

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6.16.4 From Delta Airlines, Inc: CASS requirements are duplicative and redundant to the safety assurance of the SMS Framework. Although not mandated by regulation the IEP programs as specified in the Advisory Circular are also duplicative under the safety assurance umbrella.

The SMS is the right vehicle to establish auditing and safety assurance requirements and therefore once put into final rule, we desire 121.373 (CASS) and the IEP programs must be withdrawn. [56.1]

**NOTE:** Delete 121.373 after Part 121 SMS regs become effective or assimilate CASS into SMS.

6.16.5 From Virgin America Airlines: A proper CASS program operating within a true ATOS designed organization by its very nature, is already an incorporation of SMS principles. The only possible shortfall could be in the promotion of data collection through voluntary and anonymous submissions of unsafe conditions and human errors which is not currently specific in a CASS program. SMS in fact, is built on the principles of a CASS program and a quality system. [40.1]

**reviewed**

6.16.6 From Ameriflight, LLC: I think the emphasis in SMS is upon personnel safety, whereas the emphasis on CASS and similar programs is on component quality and performance. While there is clearly some overlap between the two, I believe they are fundamentally separate matters. [2.1]

**reviewed**

6.16.7 From Jet Logistics, Inc.: Currently JLI doesn't utilize a CASS program as our operations do not require compliance. However we would agree that any SMS program should replace any current quality control programs. A very high emphasis should be placed on avoiding the duplication of efforts. [6.1]

**Reviewed (is JLI not a 135 operator?)**

6.16.8 From Miami Air International: Why reinvent the wheel? These are functional acceptable working programs (refer to Question 2c) that should simply be incorporated into the SMS. [11.1]

**reviewed**

6.16.9 From the Regional Airline Association: One of the industries subject matter experts at the recent SMS Focus Group meeting encouraged the FAA to keep their SMS compliance policy "simple". He referred to the various Advisory Circular documents currently describing CASS, maintenance reliability programs, internal evaluation programs, ASAP, etc. as good starting references for approving SMS. If we accept the premise that SMS will build on an airline's current quality management programs, then we would expect that the FAA approval process should not start from scratch but should focus on the aspects of SMS that integrate an operator's existing quality assurance programs and safety analysis practices into an integrated SMS process. [22.1]

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## Agree

From the Aviation Safety Council of Alaska (ASCA): A desktop style gap analysis may reveal that CASS is the regulation best related to SMS processes. Although not required by regulation, many operators employ Internal Evaluation Programs (IEP) to conform to industry best practices.

To avoid duplicative requirements the FAA should conduct a gap analysis and utilize information gleaned from ATOS; the FAA uses ATOS to assess conformance to the six safety attributes.

Under ATOS, the FAA has three responsibilities:

- Verify that an air carrier's operating systems **comply with regulations** and safety standards before issuing an air carrier certificate and before approving and/or accepting air carrier programs.
- Re-verify that an air carrier continues to **meet regulatory requirements** when changes occur by conducting periodic reviews: and
- Continually validate performance of an air carrier's approved and accepted programs to ensure **continued operational safety**. [71.1]

## reviewed

6.16.10 From Aero Micronesia, Inc. d/b/a Asia Pacific Airlines: I would view a future SMS as one that either manages existing system safety programs or incorporates the system safety programs already authorized or mandated by the FAA. For example, a company SMS might standardize the use of auditing and evaluation programs throughout the company and ensure that all functional areas are being evaluated. Further, the company SMS would facilitate the system safety reviews of organizational safety risks that cross organizational lines of authority. For example the effectiveness of a company anti-ice/de-ice program requires management effort and Standard Operating Procedures (SOP) from Flight Operations (e.g., holdover times, determination of “clean” aircraft, etc.), maintenance (e.g., equipment training, application of fluid, etc.). Accordingly, risk assessment and hazard identification of anti-ice/de-ice procedures brought to the attention of any contemplated SMS Review Board may need to cross many company organizational lines of responsibility. [65]

## reviewed

6.16.11 From Frontier Alaska: A desktop style gap analysis may reveal that CASS is the regulation best related to SMS processes. Although not required by regulation, many operators employ Internal Evaluation Programs (IEP) to conform to industry best practices.

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- Continually validate performance of an air carrier's approved and accepted programs to ensure continued operational safety. [67.1]

**reviewed**

6.16.12 Other Comments

- A. From Bombardier Aerospace: Leverage existing design standard FAR 25.1309. Design standard FAR 25.1309 incorporates the main essence of the proactive identification of design and operating hazards caused by systems failures, evaluating severity, establishing an acceptable level of risk and evaluating the risks using data to establish probabilities. To avoid duplication and/or contradictions between various functional group safety assessments, this design standard FAR 25.1309 should be used as the baseline for all aircraft system safety analysis and should be the foundation for risk management not only in a design organization but for all operational certificates defined throughout CFR title 14.

Credit organizations for those activities already covered

14 CFR 21.139 requires that an OEM show that it has established and can maintain a quality control system for any product, for which it requests a production certificate, so that each article will meet the design provisions of the pertinent type certificate. Continuous improvement, documentation and record systems, audits and quality assurance are part of all regulatory required systems such as design organizations, production organizations and quality management systems. Any new rulemaking involving SMS must credit the organization where practical, with existing processes that are SMS compliant.

Introduce one high level general SMS requirement rather than detailed/ customized regulation at the certificate level.

Similarly, 14 CFR 21.143 requires an OEM to submit, for approval, data describing the inspection and test procedures necessary to ensure that each article produced conforms to the type design and is in a condition for safe operation.

In addition, 14 CFR 21.143 requires each OEM to make available to the FAA information regarding all delegation of authority to suppliers to make major inspections of parts or assemblies for which the OEM is responsible.

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One way to minimize the impact of any duplication of current regulations is to adopt common general elements for an SMS and allow each business the flexibility to implement SMS within its business operations. [44.2]

- B. HEICO Aerospace: FAA should insure consistency with existing Regs, Orders and guidance material such as, Order 81 10.42C and 14 CFR21 .303, applicable ACs, COS guidance material and others. There are many strong working documents that exist today and industry/FAA must use those documents for compliance. Additional requirements may not be needed once a thorough review of existing guidance takes place. [85.1]
- C. Northern Air Cargo: A desktop style gap analysis may reveal that CASS is the regulation best related to SMS processes. Although not required by regulation, many operators employ Internal Evaluation Programs (IEP) to conform to industry best practices.

To avoid duplicative requirements the FAA should conduct a gap analysis and utilize information gleaned from ATOS; the FAA uses ATOS to assess conformance to the six safety attributes.

Under ATOS, the FAA has three responsibilities:

- Verify that an air carrier's operating systems comply with regulations and safety standards before issuing an air carrier certificate and before approving and/or accepting air carrier programs.
- Re-verify that an air carrier continues to meet regulatory requirements when changes occur by conducting periodic reviews: and

Continually validate performance of an air carrier's approved and accepted programs to ensure continued operational safety. [73.1]

**Same as ASCA**

#### 6.17 Question 14

What concerns and recommendations do you have about setting objective standards for the evaluation of SMS processes (e.g., evaluating SMS effectiveness, defining scope of hazards, establishing acceptable levels of risk)?

- 6.17.1 From The Transport Workers Union of America, AFL-CIO (TWU): TWU believes that objective standards for an SMS evaluation could be gathered by a thorough process that would evaluate the effectiveness and compliance rate of SMS covered procedures. Such a thorough evaluation of systems, best practices, and lessons learned would provide a basis for standards. [47.1]

**Unclear as to role of regulator and operator**

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6.17.2 From the Air Transport Association of America, Inc. (ATA): ATA appreciates that each airline aviation service provider can be expected to have many common, but also some unique, processes. There should be a minimum common framework that encompasses the SMS concept that would be established by rule, but the airline should be permitted to adapt to SMS to the greatest extent possible, rather than vastly restructure to accommodate it. Standards have been established for government agencies in the Joint Planning and Development Office (JPDO) process. Aviation Service Providers will be obliged to mirror these standards insofar as possible.

Because there is no appreciation regarding the regulation's ultimate character, it is virtually impossible to ensure that present day activities aimed at meeting the new standard will be sufficient. Participation in the Pilot Project is voluntary, yet there have been numerous midstream modifications made by FAA that have caused repetitive work. It is imperative that those who will create future SMS evaluation standards be in touch with operators that will eventually be governed by those regulations. Standards for effectiveness, documentation, and reporting must be clearly established and well-defined (after taking into account concerns from operators).

With any investigative, audit, or reporting program, it can be extremely difficult to set objective standards around the information being processed or the resulting actions, given the variables involved. Objective indicators should be based on the processes involved and the presence of the required elements. In concept, we trust that the SMS will work as long as the fundamentals of the system are in place. It will likely be difficult to measure the overall effectiveness of an airline SMS because of the size and varied measurements by each operating division. However, effectiveness may be measured on broader scales with metrics such as aircraft damage and lost time injuries for the company.

Hazards can be variously defined as threats (internal or external to the system), inhibitors of normal or expected production outcomes, deviations from standard operating practice, or causations for personal injury or materiel damage. In a rudimentary SMS, the safety action team is challenged to define an identifiable hazard in simple terms. The "scope" of hazards could conceivably range from an improperly guarded fabrication machine to improper inventory control procedures that would allow the wrong ETOPS-critical part to be installed on an aircraft. FAA-sponsored airline SMS pilot programs begin with a "gap analysis" to assist new SMS programs in establishing a hazard identification protocol. There should eventually be an industry review board that facilitates sharing of hazard data across the Part 121 sector through an appropriate venue such as CAST.

ATA suggests that a level of acceptable risk be established for certain broad categories of maintenance, operations, training and administration to guide oversight and evaluation of SMS processes at the aviation service provider. Individual airlines may adopt a comprehensive risk assessment matrix based on commonly-accepted industry criteria. (The commenter provided a generic example matrix.) It would appear logical to refine frequency and severity descriptors as more experience is gained.

Standardized risk assessments can be created and disseminated; however, all risk assessments are subjective in nature. The end result is a determination of acceptable versus unacceptable risk that must ultimately be decided through expert judgment by the individual organization.

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There is pervasive concern that airlines do not currently possess the ability to assess risk and establish priorities using a common vision with the regulator. The current risk assessment process in place at FAA has an undue amount of subjective input that can cause the FAA and the operator to assess risk in a vastly different way. This causes frustration and distraction for the operator and as well as the FAA. Defining what is acceptable is very difficult when the regulator enforces a view that all compliance infractions are a safety risk. SMS rulemaking will fall short without some objective, common standards to guide both the operator and the regulator. [51.1]

**NOTE:** *Service provider (operator) should be responsible to identify acceptable level of safety risk. FAA should provide oversight / informed consent (including attendance at safety decision meetings).*

6.17.3 From Air Line Pilots Association, International (ALPA): SMS processes need to be evaluated using objective standards, to the extent practicable. Training and practice will be necessary for individuals, either within government or industry, to be able to apply objective standards consistently. Organizations will need to have a dedicated cadre of individuals who will be able to evaluate SMS processes. As SMS at an organization matures, more individuals can be trained and brought into the process. The quality of FAA oversight will be the most important component in getting organizations to believe that SMS is more than another straightforward compliance issue. Flexibility and “right-sizing” to adapt SMS to work in a specific organization is paramount in gaining industry support. The assessment of a successful SMS is unlike many other audits in that the establishment of compliance may only come from an understanding of the internal functions within an organization. It is a difficult task to be both flexible and consistent at the same time when enforcing regulations; therefore, practical training and support to the field inspectors will be essential. [69.1]

**NOTE:** *Need internal company expertise in application of risk analysis tools. FAA leadership, along with effective training and guidance will be vital to accomplish a significant cultural shift.*

6.17.4 From the Association of Flight Attendants – CWA (AFA): To reiterate our response to question 3 above, AFA recommends that the “three-legged stool” philosophy should be integrated into all aspects and implementations of SMS, including evaluating program effectiveness, defining scope of hazards, and establishing levels of risk in order to fully support and enhance safety assurance and safety promotion. [59.1]

#### **reviewed**

6.17.5 From the Air Medical Operators Association (AMOA): AMOA believes that a substantial amount of existing FAA information on SMS is very subjective and theoretical in nature; there are limited practical applications available given SMS is really in its infancy. These practical examples also vary greatly in their respective mission profiles, which can change the ways in which an SMS is implemented. Once several organizations have developed and implemented an SMS, we recommend that industry segments share best practices to enhance guidance on the practical application of these principles. By sharing best practices industry groups can develop a roadmap for future guidance related to SMS within a given industry. We also recommend some type of baseline measurement to

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establish a context for evaluating SMS effectiveness. Any measurement of effectiveness needs to include safety culture as an element.

In addition to internal operator understanding, many operators have experienced a lack of commitment on the part of the local FAA oversight officials to participate in the SMS implementation process. Some of the operators surveyed are involved in the SMS Pilot Program (SMSPP) and believed their understanding of the purpose for and the technical aspects of the SMS is far ahead of their local FAA representatives. [52.1]

### **reviewed**

- 6.17.6 From the Helicopter Association International (HAI): However, in direct response to Questions 14, 15 and 16 of the ANPRM, HAI submits that any future SMS rulemaking designed to mandate and guide the implementation of SMS must be scalable, must be phased in gradually and must take into account the differences between Part 121 Air Carriers and other segments of the aviation industry.

The beauty of the SMS concept, from a General Aviation and helicopter industry perspective, is that it is inherently a “scalable” process which can be customized to fit the circumstances, mission types, and business plan of any organization regardless of size or complexity. This flexibility is essential to the success of SMS as applied to small businesses in general and even more so, as it would apply to the helicopter industry, in particular, because of the diversity in helicopter mission types and because the vast majority of helicopter operations are small and medium sized businesses.

The danger in this rulemaking activity, as in any effort of the FAA to establish standards that apply across the board to cover the full range of aviation activity, is that if it does not take into account the size, scope and/or complexity of the covered operation, it will result in a highly prescriptive regimen that is designed primarily for large air carrier operations.

As a result, HAI suggests that the IHST’s Safety Management System Toolkit be used as a starting point for the development of standards for the implementation and oversight of SMS as it applies to Part 135 and Part 91 operations. [79.1]

### **Scalable, flexible Phased implementation**

- 6.17.7 From Delta Airlines, Inc: It is imperative that objective criteria should be developed to evaluate an effective SMS.

**Recommendations:** Continuous improvement is a core requirement to the effective evaluation of system improvements and the system itself so it can be monitored continuously vs. periodic assessments. Methods for assessing the changes to the SMS using a back test approach are recommended. This allows for incorporation of historical performance and utilization of reliability measures in identifying net changes inherent to the system. Robust root cause analysis, processes, safety concerns, systemic changes and factual data can be utilized to foresee results eliminating future occurrences and operational risks. [56.1]

### **measuring SMS process effectiveness**



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6.17.8 From Virgin America Airlines: We are very concerned about objective standards of evaluation because each organization is different in size and scope. The standards must be broad enough to encompass the differences or should have weighted standards depending on the size and nature of the organization. [40.1]

**reviewed**

6.17.9 From Ameriflight, LLC: This will be difficult to quantify, and very difficult to standardize – because of inherent differences in operator activities and inspector personalities and backgrounds. The evaluation process needs to be kept simple and objective. [2.1]

**reviewed**

6.17.10 From SMS4Aviation, LLC: The most common question we get is the acceptability and approval of SMS programs. We are quite familiar with the OHSAS/ISO certification (registered) process that exists for companies that wish to incorporate those standards. For aviation service providers, there is no formal or informal approval process for their SMS programs at the current time. What we have suggested to operators is to obtain the “Confirmation of Conformity” declaration from a third party and follow the ICAO/FAA guidelines as closely as possible. Until the ICAO/FAA establishes a process to get the SMS validated as part of the process to become certified, operators are left uncertain if their SMS is in compliance with guidelines. [3.1]

**reviewed**

6.17.11 From Jet Logistics, Inc.: Don't do it! What may work for American Airlines may not work for Jet Logistics. How do you set standards? 1 accident a month? Is the level of risk greater for a 777 going over the pond than a King Air flying into an uncontrolled field in a mountainous area? WAY too many variables. Each SMS has to be tailored to the company. We have modified our Flight Risk Assessment Tool 7 times in 8 months. We are still trying to find out what works best for our company. [6.1]

**reviewed**

6.17.12 From Miami Air International: Keep it simple in the beginning, then build on it and keep it growing. [11.1]

**reviewed**

6.17.13 From the Regional Airline Association: The FAA's process for approving SMS for air carriers needs to identify a “baseline” standard that can be audited.

Regulations have often been referred to as “minimum” safety standards. The term “minimum” can easily be misunderstood when describing safety because such regulations are usually not “minimal” at all; we suggest the term “baseline” be used since the guidance provided a FAA inspector must clear and concise for him/her to determine the baseline compliance with the regulation. We request that the proposed SMS rule be a performance based regulation that allows an operator to adopt one of several process standards to satisfy the intent of the regulation. As operators become more familiar with

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the SMS standard, their processes will likely emerge into “best practices.” Certainly a SMS rule should encourage innovation among all participating parties.

The suggested FAA audit based on ATOS seeks to identify the “controls” that an operator has adopted without identifying what controls meet the baseline standards or what controls are considered “best practices”. Absent guidance on what “controls” are acceptable, the audit can become quite subjective since it relies on the experience of the individual FAA inspector in determining what control meets an assumed baseline standard. To reduce the subjectivity in the process for FAA approval of a SMS program, we request that the FAA provide clear the baseline standards that all individual inspectors should look for in approving a SMS program. The current FAA’s Gap Analysis Tool based on ATOS does not now provide such guidance nor is it scalable. [22.1]

**NOTE:** *performance based - Need flexibility to allow unique application at each individual organization. Can't be converted to “auditable standard”*

6.17.14 From the Aviation Safety Council of Alaska (ASCA): A major concern for smaller part 121 operators, or part 135 and 145 organizations is the regulation trying to mandate and enforce ?a one size fits all? SMS Program. During the SMS rulemaking process the FAA should interface with their own existing 121 and 135 FAR’s and the most current ATOS requirements to ensure that the SMS rulemaking process does not contradict any existing standards, regulations, other FAA orders. Any inconsistencies in the rule making will make compliance with SMS challenging and difficult to manage for any operator. While setting standards the FAA should consider that smaller 121 or part 135 operator’s objective standards may vary greatly from a large or major 121 operator.

In addition, the evaluation of the SMS program should be tied with the ATOS elements 14 CFR Part 121 Air Carrier Certification so there is less duplication of audits and process measurements. [71.1]

#### **Flexibility / scalability**

6.17.15 From Aero Micronesia, Inc. d/b/a Asia Pacific Airlines: Our concern for setting objective standards for the evaluation of SMS processes would be that the standards reflect some degree of scalability.

Any SMS rulemaking proposed by the FAA should incorporate some latitude by certificate holding offices to reconfigure the Data Collection Tools to accommodate differences in operators as to size, complexity and mission.

It is just not possible or desirable to apply the same program administration standard to every size air carrier. While the level of safety expected should be consistent, each carrier needs some latitude in incorporating the SMS model that best fits its management structure and processes. Further, the objective standards need to be widely understood among FAA Regions and certificate holding offices and consistently enforced by the FAA. Placing all Part 121 air carriers under ATOS on January 1, 2008 was a non-event for some operators and a significant time consuming and costly overhaul of management systems for others. While we have been told that FAA offices have the authority to

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reconfigure Data Collection Tools more appropriately, it has been our experience that we are confronted with the same Data Collection Tools as the major carriers. [65]

### **Reviewed**

- 6.17.16 From Chantilly Air, Inc: FAA must recognize that any SMS has to be appropriate to the size and complexity of the operation. In Chantilly Air, Inc.'s view this must allow for flexibility in the evaluation of an operator's SMS processes. Chantilly Air, Inc. would remind FAA that a well-established system of third-party audits exists today. In particular, the IS-BAO standard relies on regular audits of an operator's SMS processes, focusing particularly on the question of the "soundness, appropriateness, and effectiveness" of the operator's safety management activities. "In a registration audit all ... components of the operator's SMS will be audited to the level required to determine that it is appropriate and effective." (IBAC: IS-BAO Internal Audit Manual). The NATA Air Charter Safety Foundation audit standard, although currently less well recognized domestically and internationally, achieves a similar goal.

It is Chantilly Air, Inc.'s view that the existing system of safety management standards and audits can be a simple, easily implementable, and effective way of assuring the safety performance of SMS operators. It is also a proven way of taking into account the variety of operators' SMS needs and capabilities. [81.1]

### **Flexibility**

- 6.17.17 From Frontier Alaska: A major concern for smaller part 121 operators, or part 135 and 145 organizations is the regulation trying to mandate and enforce "a one size fits all" SMS Program. During the SMS rulemaking process the FAA should interface with their own existing 121 and 135 FAR's and the most current ATOS requirements to ensure that the SMS rulemaking process does not contradict any existing standards, regulations, other FAA orders. Any inconsistencies in the rule making will make compliance with SMS challenging and difficult to manage for any operator. While setting standards the FAA should consider that smaller 121 or part 135 operator's objective standards may vary greatly from a large or major 121 operator.

In addition, the evaluation of the SMS program should be tied with the ATOS elements 14 CFR Part 121 Air Carrier Certification so there is less duplication of audits and process measurements. [67.1]

### **Reviewed**

- 6.17.18 From Treyfect, Inc: Treyfect recommends that the basis upon which SMS effectiveness is assessed is focused on the factors noted above. When taken as a whole, understanding what an organization has and what an organization does provides a clearer picture of how an organization is actually managing safety. There are a number of historical examples that demonstrate processes alone do not assure safety. The collection and communication of leading metrics can assist in understanding how an organization is performing and support accountability. These metrics might relate to the number of documented risk assessments performed per month, to the number of corrective actions completed/closed, or to the number of "near miss" reports that are assessed and resolved. Establishing

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acceptable levels of risk may be so subjective that it cannot be managed well from a regulatory level unless it is in very broad terms. Similarly the legal implications of establishing acceptable levels of risks could delay SMS regulation. The definition of safety is 'managing risks to an acceptable level'. The ways in which each organization manages risks is an excellent indicator of its overall success. Some organizations may choose, after careful consideration, to undertake certain high risk operations by reducing the probability of an adverse event, the severity or the exposure. [23]

## Reviewed

### 6.17.19 Other Comments

- A. From Bombardier Aerospace: The idea that each organization can set its own objective standards for the evaluation of SMS processes is appealing. On the other hand, knowing that regulatory agencies are adopting SMS as part of their National aviation safety plans may lead to unintended consequences for those organizations that do not or cannot meet the standards of others.

The standards for evaluating SMS processes, if required by regulation, must be uniformly established at the outset. Unfortunately, no single international standard to define scope of hazards or acceptable level of risk within the context of SMS has been established. This lack of a uniform standard will lead to interpretation differences and disagreements at the international level. [44.2]

- B. HEICO Aerospace: FAA should insure consistency with existing Regs, Orders and guidance material such as, Order 81 10.42C and 14 CFR21 .303, applicable ACs, COS guidance material and others. There are many strong working documents that exist today and industry/FAA must use those documents for compliance. Additional requirements may not be needed once a thorough review of existing guidance takes place. [85.1]
- C. Northern Air Cargo: The evaluation of the SMS program should be tied with the ATOS elements 14 CFR Part 121 Air Carrier Certification so there is less duplication of audits and process measurements. [73.1]
- D. From a Retired FAA Employee whose background includes 27 years of service with the FAA and served as: the Director of the FAA Aircraft Certification Service; FAA Associate Administrator for Regulation & Safety; and Industry Chair of the FAA Certified Design Organization Advisory Committee: As stated above, there must be a “process model” that defines how a company’s organizational culture addresses the basic principles of safety management in everything it does. It is clear, as stated by ICAO, that SMS is really the safety culture within a company. A culture of safety is going to be hard to regulate, and even harder to demonstrate and measure by the industry and FAA, respectively. It is essential that the FAA develop a process model that measures the capability of an organization to meet its defined goals, and how mature the company is in meeting those goals. The good news is that this task has already been completed by the FAA. The FAA has developed an Integrated Capability Maturity Model (iCMM), with its associated series of manuals describing in detail how it works. It is based on CMM principles used internationally, including

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by the United States DoD. As discussed within the CDO ARC report, these iCMM principles are an acceptable process model that can easily be used by industry and the FAA to implement SMS. A CMM process model has been used by EUROCONTROL (they call it CMMI) to implement changes to its air traffic system. One needs only Google CMM, iCMM, or CMMI to see the widespread the application of these principles. This matter is discussed further in the below additional comments. [28.1]

## 6.18 Question 15

What are practical ways a small business could apply the elements of an SMS?

6.18.1 From the Air Transport Association of America, Inc. (ATA): The fundamentals of an SMS can be applied to any size organization. While the number of tools available may be fewer, the indicators of risk can still be effective. Small businesses may have a consolidated SMS manual detailing responsibilities and policies, a basic promotion strategy with a few effective communication mediums, relevant and cost effective assurance tools and a simple risk management process. It is likely that the smaller organizations will be able to use turnkey SMS products developed for small business more effectively than large airlines with many programs already in place. [51.1]

***NOTE:** SMS should be scalable and flexible enough to accommodate the spectrum of service providers. Detailed guidance may be required for small operators. Implementation phasing may need to include 'lead operator' approach, where initial implementation experience can be communicated to others.*

***NOTE:** Need to look at Canadian experience for SMS implementation at small operators.*

6.18.2 From the Air Medical Operators Association (AMOA): AMOA maintains that all operators must implement a fully developed SMS system to ensure the proliferation of safety practices and procedures regardless of the organization's size. A useful SMS is one that provides the elements and tools for a business to assess the risks involved with any business venture as well as safety risks. Small organizations however, may have to rely more heavily on third party data to identify operational hazards.

AMOA recommends the IHST SMS Toolkit, designed for small operators, as an excellent example of large-scale SMS programs scaled down for small organizations. [52.1]

### **Reviewed**

6.18.3 From the Helicopter Association International (HAI): However, in direct response to Questions 14, 15 and 16 of the ANPRM, HAI submits that any future SMS rulemaking designed to mandate and guide the implementation of SMS must be scalable, must be phased in gradually and must take into account the differences between Part 121 Air Carriers and other segments of the aviation industry.

The beauty of the SMS concept, from a General Aviation and helicopter industry perspective, is that it is inherently a “scalable” process which can be customized to fit the circumstances, mission types, and business plan of any organization regardless of size or

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complexity. This flexibility is essential to the success of SMS as applied to small businesses in general and even more so, as it would apply to the helicopter industry, in particular, because of the diversity in helicopter mission types and because the vast majority of helicopter operations are small and medium sized businesses.

The danger in this rulemaking activity, as in any effort of the FAA to establish standards that apply across the board to cover the full range of aviation activity, is that if it does not take into account the size, scope and/or complexity of the covered operation, it will result in a highly prescriptive regimen that is designed primarily for large air carrier operations.

As a result, HAI suggests that the IHST's Safety Management System Toolkit be used as a starting point for the development of standards for the implementation and oversight of SMS as it applies to Part 135 and Part 91 operations. [79.1]

#### 6.18.4 From Virgin America Airlines: Practical tools:

- Establish a Safety policy and culture by the leadership. Determine “as is” safety conditions and establish measurable goals and/or trends.
- Determine which safety data is pertinent to the business and develop a system to gather, risk analyze and act on that data. Decide how much historical data, if any, needs to be maintained. Allow a Subject Matter Expert (SME) to make decisions as a result of risk analysis.
- Have operational people use checklist controls on a periodic basis.
- Establish that the senior manager is the accountable manager for the SMS. [40.1]

6.18.5 From Ameriflight, LLC: As stated above, the “four pillars” of SMS are pretty simple and easy to implement. Potential reduction in lost employee time and other cost savings make the program practicable. In smaller operations, onerous recordkeeping requirements and mandates for dedicated personnel will make SMS impracticable. It may be that, below a certain size of company, a requirement to embrace SMS philosophy rather than requirement for a formal SMS would be the most practicable approach. [2.1]

6.18.6 From SMS4Aviation, LLC: We regularly work with small to medium sized companies (part 91/135) who can benefit the most when the SMS is understood and implemented correctly. The SMS need not be expensive or time consuming, but it does require a team effort and professional guidance for it to provide the stated goals. [3.1]

#### **Detailed guidance for smaller operators.**

6.18.7 From Jet Logistics, Inc.: Developing a tool to evaluate potential risks isn't complicated, and the size of the operation will only make it easier, or harder if the operation is more complex. A small, single pilot, operator won't have as many potential aspects to consider, so his risk assessment tool will be much less complex. SMS doesn't have to be complex, difficult, or expensive. My fear is that the FAA will make it as such, but our program was easily paid for in the first 6 months of using our SMS, and that ours is more complicated than most operators due to our size and varied types of operations. The IS-BAO program

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does a good job of answering this question and I highly recommend that the FAA look hard at IS-BAO as a way to comply with the SMS question. [6.1]

**Reviewed**

- 6.18.8 From Miami Air International: A small business will have to use a phased approach, this is the most cost effective way to proceed. The small business will have to evolve, and expand their existing Programs. Then phase in any additional programs necessary to comply with the SMS requirements over the next 3 to 5 years. [11.1]

**Reviewed**

- 6.18.9 From Aero Micronesia, Inc. d/b/a Asia Pacific Airlines: It would appear that the most practical method for a small business to implement an SMS would be to use external assistance. Very small operators do not have the capacity to conduct extensive audit programs using only persons who are not in a position of auditing their own work or disciplines. To be truly effective, some types of SMS capability reporting to top management operating independently and knowledgeable of the processes is going to be necessary for all classes and sizes of carriers. [65]

**Reviewed**

- 6.18.10 From Chantilly Air, Inc: Probably the most important element of an SMS is the development of a safety reporting system. In Chantilly Air, Inc.'s experience, setting up an internal safety reporting program is one of the more resource-intensive SMS elements. The effectiveness of an internal safety reporting program could be greatly enhanced if FAA were to confer ASAP-style protections on each SMS operator's safety reporting program. While Chantilly Air, Inc. understands that participation in the current ASAP program is open to any certificated operator, it is important, however, for FAA to understand that participation in the current ASAP program is beyond the capabilities and resources (both in terms of operator set-up time, and in terms of FSDO oversight time requirements) of almost every one except the largest operators.

Chantilly Air, Inc. makes the following recommendations: That FAA develop an ASAP program that is usable simply and easily, out of the box, by any SMS operator; and that FAA make this ASAP program available for incorporation into each operator's SMS. [81.1]

- 6.18.11 From Treyfect, Inc.: In the United States, SMS is essentially defined under the Occupational Health & Safety Administration (OSHA), Mine Safety & Health Administration (MSHA) and Department of Energy (DOE) Federal Regulations. H.R. 875 Food Safety Modernization Act of 2009 also sets forth the recommendation for the development of SMS through the proposed Food Safety Administration. It is clear that SMS is not just a "flavor of the month" and it is not going away. Small businesses likely have the ability to drive cultural change more quickly than large businesses. As noted above, senior leadership support is the single most important factor in organizational safety management and viewing SMS as a means to maximize and generate profits is an especially important message for small business leaders. Treyfect recommends that the FAA establish a program for small businesses to assist with SMS education, training and

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outreach. OSHA successfully uses cooperative programs to encourage "voluntary collaborative relationships". [23]

Reviewed

#### 6.18.12 Other Comments

- A. From Bombardier Aerospace: An important aspect of any aircraft OEM's quality system is the performance of the supplier community. Many of these suppliers are small businesses and do not possess the quality assurance engineering support to adequately implement safety management systems and/or processes beyond the ones they currently have in place. Imposing another system like SMS, needs to be introduced with care to ensure that they are able to cope with this additional regulatory requirement. [44.2]
- B. Northern Air Cargo: Follow the example of the Regional Air Cargo Carriers Association. [73.1]

#### 6.19 Question 16

What are your concerns and recommendations regarding the FAA making the transition to requiring SMS of product/service providers (e.g., schedule for implementation, FAA acceptance and approval procedures, oversight)?

- 6.19.1 From The Transport Workers Union of America, AFL-CIO (TWU): TWU has concerns regarding transition to an SMS as it relates to human resources/staffing and efficient processes that provide appropriate vetting for acceptance and approval of programs, while maintaining a reasonable transition and implementation timeline. Following the implementation, the FAA must ensure and maintain effective oversight of such SMS programs. TWU is in complete agreement that any product/service providers that specifically deal with oversight of the safety aspect of the aircraft should be included in any SMS program. [47.1]

**Reviewed**

- 6.19.2 From the Air Transport Association of America, Inc. (ATA): ATA's major concern is that the January 1, 2009 deadline for compliance with the ICAO SMS Standard and Recommended Practice in Annex 6, Section 3.3 (requiring SMS implementation) has passed. ATA had been assured by various regulatory sources that upon the filing of a "difference" to ICAO by FAA, U.S. carriers would be protected against any adverse actions by States (signatories to the Chicago Convention of 1947). ATA suspected States that had imposed SMS implementation upon their own commercial air carriers under the jurisdiction of their Civil Aviation Authorities might decide unilaterally not to accept the U.S. difference. Indeed, ATA has since experienced the refusal of a State to permit entry by a U.S. carrier that did not have an "ICAO-compliant" Flight Data Analysis program as required by Annex 6, Section 3.3.7. ATA urges the adoption of an FAA Final Rule covering Part 121 Aviation Service Provider SMS as soon as practicable. The majority of ATA air carriers have begun the SMS journey through AFS-900 pilot programs.



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ATA Airlines are concerned about how the transition for air carriers and other operators will be developed and regulated. There must be a clearly established schedule for implementation (taking variables within a particular operator's environment into account) and a clear presentation of the expectations to those that will be regulated. If there will be a separate SMS rule for contract providers to air carriers, there must be a reasonable timeline associated with that transition as well. Clearly defined guidelines on FAA acceptance and approval procedures are vital to a smooth transition to SMS for any operator. There should be no surprises, and operators should be given explicit guidance on what will be expected and how their SMS will be evaluated.

Since the FAA has traditionally maintained standards by enforcement behavior, there is concern that the FAA will try to implement SMS by rule enforcement. SMS participation must be a collaborative effort to enhance safety. SMS should evolve within an organization through incentives. The implementation schedule must allow adequate time for training and development of supporting systems. Several airlines do not relish rebuilding their airline to fit a rigid set of SMS requirements. Having made significant changes already in response to the ATOS process, they do not see any merit in repeating the overhaul and branding it SMS.

These operators envision a rule that allows them to build incrementally on what they have, with an FAA acceptance criteria that is consistent across the CMOs and FSDOs. Ideally, such a rule would allow adequate time to complete the transition without excessive hiring, would incorporate the ATOS upgrade, would acknowledge effective practices that may ultimately not be stipulated in rulemaking. An approval process controlled from FAA headquarters is highly recommended, as this has been generally effective in bringing ASAP and FOQA programs on line.

Given the oversight that will be provided at the local level, clear standards and a practical approach to the training of inspectors in the field is critical to the success of SMS. [51.1]

***NOTE:** Need expedience of FAA regulatory action to address ICAO Standards. FAA must be prepared to accept or approve operator's SMS to accommodate international operations. SMS will require collaborative effort. Implementation schedule allow for different size operators.*

6.19.3 From Air Line Pilots Association, International (ALPA): SMS implementation in the United States will require a transition period after publication of a final rule requiring SMS programs. We expect that many organizations that will be required to have SMS will have elements of an SMS already in place. Others may have little that can fit within SMS. There will be a great effort to conform programs to fit SMS and guidance will be required from the FAA for these organizations to proceed. The implementation period must be reasonable but not open ended. The FAA must be able to provide organizations with consistent and reasonable guidance regarding approval and acceptance of SMS programs and milestones to assure that SMS implementation goals are being met. [69.1]

**Transition period. FAA guidance.**

6.19.4 From the Allied Pilots Association (APA): APA's concern is that the schedule of implementation should only be contemplated after there is clear understanding and development of program acceptance and approval procedures by the FAA and adequate

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guidance for providers on how to gain such approval. This process must be consistent and objective. All participants must understand what is required to implement an SMS program and it should not be a moving target. Only then could an implementation schedule be addressed. [76.1]

**Addressed by existing regulatory process and Pilot Program**

- 6.19.5 From the Association of Flight Attendants – CWA (AFA): The AFA fully concurs with the following comment submitted by Deborah A.P. Hersman, National Transportation Safety Board Chairman, on October 20, 2009, to this ANPRM docket: “[A]s the FAA moves forward with rulemaking activities in this area, it must ensure that SMS programs facilitate and do not subjugate the FAA’s essential responsibility to provide direct and active oversight of operators and service providers in this industry.” The AFA is very concerned with the FAA transition from its traditional oversight functions to system safety methods and operator safety management. The FAA risks transferring oversight functions and determinations of “acceptable risk” from the regulatory authority, acting in the public interest, to airline operators and other service and product providers, acting in their own economic interests. It is therefore imperative that the FAA continue to exercise inspection, surveillance and audit responsibilities. While AC-120-92 maintains that audits “may” be conducted [AC-120-92, p.18], it is essential that unannounced audits be conducted periodically to assess system effectiveness and provide assurance and validation to the public that aviation safety is being maintained at levels equivalent to (if not better than) current levels. [59.1]

***NOTE:** SMS not intended to replace or supplant FAA oversight activities. SMS necessarily includes operator risk management decisions, but with FAA involvement and oversight.*

- 6.19.6 From the Air Medical Operators Association (AMOA): FAA must ensure that all operators affected by this mandate have a voice in the SMS ARC following a formal announcement of the intended timeframe. We also impress upon FAA the importance of ensuring that the acceptance and approval procedures imparted by all FAA personnel, in the context of SMS implementation as well as other FAA regulations and guidelines, are consistent from one FSDO to the next. The consistent application of standards across the country relative to FAA regulations must be improved.

Further, SMS cannot become a new avenue for retribution by the regulators. Safeguards must be put in place to protect the operator and employees when new or additional information is learned through the SMS process. These safeguards exist in many FAA programs like ASAP, but they have not yet been addressed in the SMS process and are critical to its success. [52.1]

**Consistency of FAA oversight (will require FAA Orders, training and guidance).  
Data protection addressed in previous questions.**

- 6.19.7 From the Helicopter Association International (HAI): However, in direct response to Questions 14, 15 and 16 of the ANPRM, HAI submits that any future SMS rulemaking designed to mandate and guide the implementation of SMS must be scalable, must be phased in gradually and must take into account the differences between Part 121 Air Carriers and other segments of the aviation industry.

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The beauty of the SMS concept, from a General Aviation and helicopter industry perspective, is that it is inherently a “scalable” process which can be customized to fit the circumstances, mission types, and business plan of any organization regardless of size or complexity. This flexibility is essential to the success of SMS as applied to small businesses in general and even more so, as it would apply to the helicopter industry, in particular, because of the diversity in helicopter mission types and because the vast majority of helicopter operations are small and medium sized businesses.

The danger in this rulemaking activity, as in any effort of the FAA to establish standards that apply across the board to cover the full range of aviation activity, is that if it does not take into account the size, scope and/or complexity of the covered operation, it will result in a highly prescriptive regimen that is designed primarily for large air carrier operations.

As a result, HAI suggests that the IHST’s Safety Management System Toolkit be used as a starting point for the development of standards for the implementation and oversight of SMS as it applies to Part 135 and Part 91 operations. [79.1]

**Reviewed**

- 6.19.8 From Delta Airlines, Inc: None. To meet the expectations of the SMS implementations, requirements can be streamlined to provide the service providers latitude and scalability depending on the scope of their operations. [56.1]

**Reviewed**

- 6.19.9 From Virgin America Airlines: FAA usually does well in transition times for requirements such as these. Perhaps there could be milestones to ensure logical and realistic implementation dates. [40.1]

**Reviewed**

- 6.19.10 From Ameriflight, LLC: As stated previously, I think the distinction between product quality and personnel safety needs to be kept in mind.

One of the most difficult problems associated with industry-wide implementation of SMS will be training of FAA personnel charged with surveillance of operators’ SMS programs, and producing a “sea change” from sanction-based enforcement to the more proactive, results-based approach associated with the SMS philosophy.

Operators will need a reasonable period of time to develop their own SMS, and additional time to obtain FAA approval or acceptance.

It appears to me that at least two years beyond publication of the final rule will be needed for this. [2.1]

**Reviewed**

- 6.19.11 From SMS4Aviation: We believe that the FAA should return to the OHSAS standard which is the internationally recognized standard for SMS. However, short of that, we

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believe that the FAA could establish a process for companies, (ours included) to become “approved” SMS implementers. That would provide some confidence to operators who at this time are waiting to see what the FAA is going to do. We have been involved with SMS/EMS for more than 20 years and understand it better than most. We also realize that aviation flight and maintenance operations do present some unique challenges regarding hazard identification and mitigation. However, we also believe that having a precise Policies and Procedures manual integrated into a standard SMS program would provide the safety improvements we all seek.

Our recommendations with regard to aviation service providers are the following:

- A. Incorporate SMS following ICAO/SMS guidelines.
- B. Perform internal audits per guidelines.
- C. Request a third party declaration known as “Confirmation of Conformity”.

Unless a flight or maintenance department wishes to become “registered” for the OHSAS, ISO, or IS-BAO standards, there is no mechanism currently in place that provides assurance of SMS acceptability. We always provide the declaration and recommend that it be updated annually. That is how the ISO and OHSAS standards handle the self-declaration that is an option to them without the need for a full blown third party audit. It has proven to be highly effective as well as cost effective while providing the confidence organizations need.

It has been our experience that SMS can be a tremendous opportunity to improve safety, efficiency, morale, professionalism and save money. But it has to be implemented correctly and integrated into the corporation fully for it to work. Implementation is by far the biggest challenge flight and maintenance operations are facing. [3.1]

#### **Reviewed**

- 6.19.12 From Jet Logistics, Inc.: I highly recommend the FAA review and consider adopting the standards and protocols set forth in the International Standards for Business Aircraft Operations (IS-BAO). This program was developed by IBAC, in conjunction with ICAO standards. Why does the FAA have to “reinvent the wheel” every time an issue such as this is raised? These standards have been developed for years, and the program works for virtually every country in the world. Yet the FAA seems to feel that they have to develop a whole new program. It would be much cheaper, faster, and more efficient for the FAA to simply pass a regulation that states a certificate holder should comply with the standards and protocols set forth in the IS-BAO program. Give everyone a reasonable time frame to comply due to availability of auditors. This will keep the FAA’s costs down as the program already exists, so no development cost. Plus, IS-BAO has its own approved auditors so it will not create a whole new level of government work that the FAA inspectors have to handle. They can’t handle the work load they currently have so adding to this won’t help. [6.1]

#### **Reviewed**

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6.19.13 From Miami Air International: In order for SMS to succeed at any level it must have commitment and funding from the State. [11.1]

#### **Reviewed**

6.19.14 From the Regional Airline Association: RAA members support the concept of SMS. Many of our member's indicate that they already have in place most of the attributes of an SMS program. If they have a concern it is with the process by which the FAA inspection staff will approve and oversee their program once SMS becomes mandatory. We view guidance for the FAA in approving and overseeing a SMS program for operators as important as the rule itself.

Once an operator's SMS program is approved, the operator may make subsequent changes to their SMS program without prior approval by the FAA provided the operator's baseline requirements for SMS remain intact.

Once adopted the proposed SMS rule needs to be administered like the current CASS rule (FAR 121.373, continuing analysis and surveillance system). Like a "mini-SMS" CASS is a continuous closed-loop cycle of surveillance, investigation, data collection, analysis corrective action, monitoring, and feedback for operators to use to monitor and correct any deficiencies. Once approved changes made to the CASS process by the operator do not require prior approval by the FAA before they are implemented. The FAA's role is not to design the CASS but to ensure the operator has satisfactory policies and procedures in place (Ref: AC-120-79).

A major component of SMS is the risk assessment process for identifying new hazards and when mitigating elevated hazards. We consider the FAA inspector as having the right to inspect to ensure that this process is part of the operator's procedures but undoubtedly there will be occasions were a FAA inspector may disagree with the risk assessment and or hazard mitigation selected by the operator. We view these decisions as part of the operator's management responsibility. The FAA inspector may conclude that the operator's decision is inappropriate and therefore implement greater oversight of the operator and/or may voice his/her concern with the operator; the decision though is that of the operator and clear guidance should be provided to capture the role of the FAA inspector in overseeing an operator's SMS process. [22.1]

#### **CASS oversight as historic example. Importance of clear guidance.**

6.19.15 From Omni Air International: Our primary concern with a regulated "transition to an SMS" is that, as currently constituted, the United States Federal Aviation Administration (FAA) may be inadequately prepared to provide an appropriate level of oversight to allow for anything other than a one-size-all approach to safety management. Specifically, current principal inspectors, while extensively experienced in flight and maintenance operations, have very little exposure to integrated safety management systems and appear to be required to conduct their oversight activities in accordance with very rigid checklists. Even the well intentioned effort by the U.S. FAA to implement the concepts of systems safety through the Air Transportation Oversight System (ATOS) has devolved into a process of execution of extensive checklists to feed the database and the data analysts. This has effectively removed any capability by those directly responsible for air

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carrier safety oversight to assess whether the core elements of system safety about which ATOS was designed (Responsibility and Authority, Processes, Controls, Process Measurement, and Interfaces) existing within the systems under review. It has created an environment in which all air carrier manuals, despite the diversity of operations, have begun to look like a single standard that serve only to facilitate the oversight activities of the principal inspectors and contribute little to the improvement or assurance of an appropriate level of safety. [83.1]

**To be effective, SMS must avoid degenerating into an audit box-checking exercise.**

- 6.19.16 From Aero Micronesia, Inc. d/b/a Asia Pacific Airlines: Applying an SMS requirement to service providers and their products will invariably increase the cost to the operator for these products and services. While there may be some increase in safety from an SMS administered by providers of scheduled maintenance or producers of aircraft parts, the benefits may not outweigh the costs for providers of services like painting and stripping, catering, aircraft cleaning, manual development, etc. We would question whether the FAA has the staffing to effectively provide oversight if the list of entities required to have an SMS increases significantly. [65]

**Reviewed**

- 6.19.17 From Chantilly Air, Inc: Chantilly Air, Inc. believes that an initial SMS is relatively simple to implement for any product/service provider. A period of one year should, in most cases, be sufficient for initial deployment. To encourage continuing improvement, this initial development period should be followed by a multi-year period during which product/service providers show continuous improvement of their SMS programs. In Chantilly Air, Inc.'s experience, this is not an ambitious, but realistic, timeline. We urge FAA to fast-track SMS implementation to the extent possible; and we expect that the industry will understand the benefits of rapid implementation. [81.1]

**Good luck**

- 6.19.18 From Frontier Alaska: Concerns regarding the transition to regulating SMS include allowing the air carrier to implement SMS based on a realistic schedule, to ensure the appropriate interfaces are in place with existing SMS components and other programs that will be impacted by the introduction of additional SMS processes and/or documentation. Additionally, it is recommended that SMS is an accepted program rather than an approved program. With accepted programs, the FAA CMT can provide the operator with valuable guidance and suggestions without delaying the process of distributing the program and information as needed to the employees, this is especially true for continual improvement and revising forms/documents. [67.1]

**Compliance demonstration concern**

- 6.19.19 Other Comments

- A. From Bombardier Aerospace: The FAA should recognize the extensive risk management activities already in place in the manufacturing sector before developing any SMS regulations.

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B. OEMs are unique in the context of SMS because the very nature of the manufacturing process coupled with the requirements of the applicable Federal Aviation Regulations (Parts 21, 23, 25, or 33, etc) establish a quality management approach that ensures manufacture of safe and reliable products. The existing regulatory system provides an organizational framework to support a sound safety culture. As noted earlier in the discussion, FAR 21.139 and 21.143 requires that OEMs create a structured set of tools to meet their regulatory responsibilities, and concurrently, provides significant business benefits. The existing regulatory regime incorporates internal evaluation and quality assurance concepts resulting in a more structured management process as well as a continuous improvement of operational processes. In addition, an OEM's safety management and quality controls are further enhanced by various external quality control and safety reporting processes. For example, quality and safety of OEM products are currently monitored by the FAA's systems of Aircraft Safety Alerts including the following:

- 1) Airworthiness Directives (AD);
- 2) Special Airworthiness Information Bulletins (SAIB);
- 3) Maintenance Alerts;
- 4) Service Difficulty Reports (SDR);
- 5) Service Difficulty Reports History;
- 6) Unapproved Parts Notification;
- 7) Reporting of failures, malfunctions, and defects reports (FAR 21.3).

Therefore, it is our recommendation that in the event that FAA develops regulations requiring SMS for a design and manufacturing organizations, the regulatory language and advisory material should be non-prescriptive and flexible enough to allow the continued operation of existing successful and effective systems and acknowledge these existing processes as part of the Means of Compliance for SMS.

Other general concerns and recommendations are the following:

- Work with industry to develop simple, flexible, efficient regulatory language, and effective, applicable guidance.
- Develop training and guidance for FAA Management and personnel to ensure that eventual SMS regulation, if adopted, does not result in unnecessary and undue regulatory compliance burden.
- Work with other State regulatory authorities and with ICAO to develop a carefully coordinated approach to SMS regulation implementation, including appropriate bilateral aviation safety agreements. [44.2]

C. HEICO Aerospace: HEICO Aerospace would not have any significant concerns at this time. As previously noted, our current systems cover what we know today to be the key aspects of an SMS. However, industry/FAA must work together (ARAC) to

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insure we do not impose costly additional requirements that either already exist and/ or do not provide measurable safety benefit. [85.1]

- D. From the Aviation Suppliers Association (ASA): A SMS is a management system. It is meant to accomplish specific goals but it may be generalized as fitting within the category of management systems.

Management systems can help a company meet important goals – like safety goals, regulatory compliance goals, and quality goals. But they are only tools for meeting those goals. A safety management system should not be the FAA’s ultimate goal; rather the FAA’s goal should be to increase safety. A tool that helps a company increase safety is a means to an end – not an end in itself.

Tools come in many sizes. A safety management system that perfectly meets the safety needs of a very large company may be an inappropriate fit for a medium sized company – and that same system might suffocate or bankrupt a small company. For this reason, the regulations implementing safety management systems should focus on the goals to be achieved, rather than the manner in which those goals are achieved.

The best way to avoid problems in the initial implementation of a SMS system is to take a four-step approach to implementation:

- (1) Recognize where the FAA has already established the elements of SMS, and forbear from redundancy;
- (2) Specifically identify those elements of an SMS program that are not yet implemented in existing FAA regulations (the ‘Additional Elements’);
- (3) Establish voluntary compliance mechanisms for those Additional Elements;
- (4) Review the Additional Elements implementation process and use feedback from the process to identify Additional Elements that may need to be treated differently (e.g. dropped from the recommended guidelines if ASA they are not helpful, and implemented through regulation if they are found to be essential).

This permits the FAA to roll out the system quickly, without the delay of slow regulatory implementation and without the threat of litigation that has slowed implementation of some rules. [70.1]

- E. Northern Air Cargo: As long as the FAA conducts the surveillance of these types of companies. To require that each air carrier validate each vendor’s SMS would be totally impractical. [73.1]

## 6.20 Question 17

Please provide any additional information you think is pertinent.



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6.20.1 From The Transport Workers Union of America, AFL-CIO (TWU): TWU appreciates the need for sharing safety-related data for analyzing and trending purposes, both intercompany and within the aviation industry, to prevent accidents. Our membership remains involved in existing safety and risk management endeavors such as CASS, ASAP, and self-audit programs, and plan to continue this involvement in the future. TWU believes that the most critical pieces of guidance will come in the form of 1.) a strict confidentiality process for sharing and analyzing data, in an effort to protect both our membership and the carrier, and 2.) personnel training for all employees in order to ensure a comprehensive understanding of and strong support for safety risk management endeavors.

TWU also believes that FAA Order 800.367, AVSSMS Requirements, Appendix B details the foundational elements of a Safety Management System, specifically in relation to the Safety Policy and Employee Reporting System. TWU agrees that it is the organizations responsibility to develop a safety policy that includes commitment to implement and maintain an SMS, and to continually improve the level of safety, manage safety risks, and comply with legal, regulatory, and statutory requirements. It is the organizations responsibility to set the expectation that employees are to report safety issues and provide feedback for solutions and improvements. To that end, the organization should establish 1.) clearly defined standards of management responsibilities, 2.) acceptable behavior, 3.) manage the setting and review of safety objectives, 4.) clearly communicate these commitments and expectations to all employees, 5.) followed by periodic reviews of safety policies.

TWU is in full agreement with FAA Order 8000.367, AVSSMS Requirements, Appendix B.C. in that the organization must maintain an employee reporting system where employees are encouraged to report safety concerns, and to do so without reprisal. Research conducted within the aviation industry has demonstrated a strong level of mistrust between management and labor within the “organization”, largely due to the perception that management prioritizes schedules over safety, and then turns a blind eye to deviations until an injury or accident occurs. The research concluded that “the perception of compromise damages the relationship between management and labor, resulting in a deterioration of communication; the credibility of a safety program is measured by management’s application of that program.” TWU is in complete agreement with this summation, and believes that neither management nor labor must tolerate the compromise of safety. This demonstrates the need for a strong safety policy that is communicated to all employees and reviewed periodically for applicability and appropriateness.

In conclusion, SMS guidance that embodies the foundational principles detailed above in conjunction with proper implementation within a committed organization enhances safety for the flying public, employees, and the aviation industry as a whole.

TWU has four remaining concerns:

1. TWU has concerns regarding the implementation of fatigue standards in an SMS, such as those implemented in Canada. Should the FAA implement fatigue standards, or implement duty limitations, any new regulations must protect the rights of workers.

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2. TWU believes that any SMS program predicated upon “just culture” or human-based factors is counterproductive. The aviation industry should remove, mitigate, or train away from safety hazards, rather than punishing individuals.

3. TWU believes that the most valuable guidance material is based on the ICAO model. However, AC120-92 and other FAA guidance fail to set a standard necessary to obtain full implementation of SMS. To that end, further study of best practices must be a component for setting standards. [47.1]

A. Operations and Training Comments:

- 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - a) Yes
- 2) Is it valid to the discussion? Yes or no
  - a) Yes
- 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
  - a) Add! Comments from master ANPRM recommendations document page 216 bullets 1, 2, and 3.
- 4) Is it a scope related comment? Yes or no
  - a) No

6.20.2 From Air Line Pilots Association, International (ALPA): Trust and voluntary programs: We have seen some disagreements between the employees’ representatives and airline managers regarding the use of ASAP safety reports within some of our airlines in the recent past. This situation has resulted in the temporary suspension of some safety reporting programs. Safety reporting programs are a cornerstone of a safety culture yet some airlines continue to get distracted by an irrational fear that employees will abuse these programs. The result is that airline operators set peculiar limitations on the frequency of usage and the source of the initial report and still allow for the documentation of use on an employee’s file. If we are to write regulations and guidance for the interpretation of SMS, we should take this opportunity to develop policies and processes with values and limitations that both the front-line employee and the rest of the industry share. Currently, there is little trust in these programs and far too much concern over opportunities to discipline with far too little concern over how to strengthen the trust required to make these safety information gathering programs more effective.

A. Operations and Training Comments:

**NOTE:** *The group understands the commenting party’s concerns as it relates to safety reporting systems being the engine behind SMS. Thus we believe a successful SMS must have adequate internal and external data protections built-in that include data retention timelines. Additionally, SMS policy should have a strong culture change component that codifies methodologies, practices and measurements that guide the organization through necessary culture change.*

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FAA Oversight: SMS does not mean that organizations will become self-regulating. If anything, the information gathered should enable oversight entities to make a more complete assessment of the organizations for which they have oversight responsibility. As mentioned above, it will be necessary to ensure that FAA personnel have received adequate training for their oversight responsibilities with SMS. It also will be necessary for the FAA to have a feedback system set up for their inspectors to share lessons learned and to enable a more consistent oversight protocol for all organizations.

#### 6.20.3 Operations and Training Comments:

**NOTE:** *The group believes that a successful SMS will have an internal oversight component that compliments FAA oversight thereby providing the required checks and balance SMS policy requires.*

Employee involvement: Regarding SMS implementation, it is important to involve all relevant employee groups along with the FAA Principal Operations and Maintenance Inspectors during the initial planning stages. To be successful, SMS implementation should not be seen as yet another management program supported and signed off by numerous vice-presidents. Employee groups, or their designated representatives, must be involved in the planning process so that they can best support the implementation efforts.

#### 6.20.4 Operations and Training Comments:

**NOTE:** *The group agrees with the commenting party in that SMS should not be viewed or practiced as just another management program supporting the status quo. Additionally, SMS policy and guidance shall require Employee group participation in planning, implementation and support efforts.*

Airport Operators: The airport operators in the US have worked to develop SMS implementation programs with little coordination from those affected in the scope of this SMS rulemaking. This appears to be an example of different “silos” within the FAA and it is not constructive. It will be important to ensure that the efforts are coordinated and that lessons learned are shared since we share the same operating environment.

Timeline for implementation: To ensure that businesses are not adversely affected when operating outside the US, it will be necessary for the FAA to coordinate closely with other national aviation authorities while US SMS implementation efforts continue. [69.1]

6.20.5 From the Air Medical Operators Association (AMOA): As organizations that have implemented SMS in different iterations and models, all of the AMOA survey respondents agreed that SMS implementation is a step-by-step process that needs to be integrated slowly into an organization and given time to mature. As previously stated, various portions of SMS exist in current regulations, but a system that connects these management and safety principles in a cohesive structure that is reinforced by quality operations data and committed to by management and line personnel is a relatively new concept. Any SMS regulation must be performance-based, taking into account the size of the organization and its mission, and based upon proven concepts taken from real-world examples.

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In summary, AMOA believes that a fully developed SMS, as recommended by the IHST should be modeled after the ICAO Safety Management Manual (Doc 9859-AN/460) and FAA Advisory Circular, AC 120-92, Introduction to Safety Management Systems for Air Operators. The fully- developed SMS must represent a structured methodology for managing safety across the entire spectrum of aviation operations. The SMS attributes are interdependent and must enhance the safety of every process or activity within the collective operation or system. The SMS is dynamic and must be updated through continuous quality improvement.

- 1) This SMS must include but is not limited to the following attributes:
- 2) Senior-Level Commitment (Advocacy, Resourcing, Values & Culture)
- 3) Safety Structure, Hierarchy & Accountability
- 4) Compliance-Based Requirements (Policies, Procedures, Guidelines, Checklists, etc...)
- 5) Risk Management Methodology (Systematic Process)
- 6) Safety Reporting (Standard & Anonymous Functionality, Proactive Hazard Identification & Reactive Occurrence/Event Disclosure)
- 7) Root Cause Analysis/Investigation Methodology
- 8) Safety Trend Analysis Program
- 9) OSHA & Safety-Related Training Program
- 10) Best Safety Practices (BSP) Sharing & Lessons-Learned
- 11) Action-Oriented Safety Committees
- 12) Safety Awards Program
- 13) Audit & Surety Program

AMOA members agree that these enhancements cannot be singular in focus, but rather a part of organizational change. We also agree that there is no stopping point; while we can advance the level of technology, training, and management oversight to unprecedented levels, especially when compared to other areas of on-demand aviation, we cannot forget the critical importance of the day-to-day interaction between crews and aircraft. For this reason AMOA continues to support the Vision Zero initiative which pursues personal vigilance and a daily affirmation of safety principles. [52.1]

A. Operations and Training Comments:

**NOTE:** Agree with performance based rules. Have to leave attributes of SMS in guidance material. Some of the identified attributes of the comment are not currently covered by FAA SMS guidance material (Root cause analysis, OSHA & Safety Related Training Program, Best Safety Practices, Action Oriented Safety Committees, Safety Awards Program). Which processes/activities within the company that are covered by the SMS should be reviewed and identified.

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6.20.6 From Delta Airlines, Inc: Collection of hazards (Hazard Identification): The following concerns are additional information pertinent to a successful SMS implementation:

- Interdependencies of all SMS data such as airline, airport, MRO, repair stations, ATC, and FAA data.
- Incompatibilities, interdependencies, relationship, interaction, and overlap, between different SMSs (Airline, Airport, MRO, Repair stations, Manufacturing and Design, and ATC) that could affect the collection of hazards, the scope, and data control.

Under the current guidance, the program material for service providers and the portrayal of a fully implemented management system is short of an effective SMS that can ultimately be successful in identifying and eliminating risks before it manifests into an event.

Upon compliance, the service providers will have a basic SMS; however conformance does not assure the effectiveness of the program. Complete senior management commitment, proactive data analysis, continuous monitoring, and embracing the spirit using the SMS principles manifest an effective SMS. [56.1]

A. Operations and Training Comments:

- 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - a) Yes.
- 2) Is it valid to the discussion? Yes or no
  - a) Yes. Their comments are based on lessons learned in a large organization in the SMS implementation process.
- 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
  - a) Yes. All comments are relevant.
- 4) Is it a scope related comment? Yes or no
  - a) Yes. It points out that it will be difficult to regulate the interfaces between the various certificated entities.

6.20.7 From Virgin America Airlines: Additional information:

- The SMS rule should not require an already effective CASS program in an ATOS environment to be re-designed and bureaucratized.
- In Parts 21, 91, 121, 127 and 145 organizations, there should be established another regulated position such as those in 14CFR 119.65. The “Accountable Manager” is defined as that person within the organization who does not need to seek permission from a higher authority to spend funds to meet the requirements of safe operations. The accountable manager must be approved by the oversight authority (FAA) and held accountable for the proper functioning and results of the SMS.

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•Goals and initiatives to maintain an “acceptable level of safety” must be realistic and mutually acceptable to operators and the FAA. [40.1]

A. Operations and Training Comments:

- 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - a) Yes
- 2) Is it valid to the discussion? Yes or no
  - a) Yes
- 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
  - a) Yes, clearly define how existing programs would fit into the SMS instead of redesigning or modifying existing programs. Utilization of positives in an existing program to fit into the SMS environment.
- 4) Is it a scope related comment? Yes or no
  - a) Yes, with respect to who is the Accountable Manager for the SMS? And what are the FAA requirements or guidance for a responsible accountable manager for SMS. Accountable manager committing to establishing the SMS - senior level leadership signing off on the dotted line vs. knowing the operation.

6.20.8 From Jet Logistics, Inc.: I have been personally involved with the FAA’s efforts at developing an SMS. Although the intentions are good, and the people involved very competent, the program to date is far too complex, complicated, and expensive to implement. If left in its current state the FAA will experience serious push back from industry for any sort of requirement via regulation. The program needs to be simplified, and then it’s benefits clearly explained. The SMS that JLI has implemented, through IS-BAO, has benefited this organization many times over, and we cannot imagine operating without it at this point. The program has been very proactive in mitigating risks, and at identifying potential incidents/accidents BEFORE they occur. Isn’t that what we are trying to accomplish when we speak of safety? The industry needs this program, but only if it’s implemented in a reasonable, sensible, cost effective manner. [6.1]

A. Operations and Training Comments:

The group concurs in that the industry needs scalable yet robust SMS programs and that by design will, in the long term, reap cost benefits that will equate to cost effectiveness.

6.20.9 From Miami Air International: Other Government agencies that work with or have jurisdiction over Service Providers should be contacted for inputs into this process. The Department of Defense has IEP requirements that could be incorporated into and enhance the development of SMS. The Transportation Security Administration should also be invited to participate in the process.

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The spirit of SMS must be embraced by everyone involved in order for it to work as designed and intended. In the same manner the Service Providers are expected to embrace SMS in its development, implementation and continued support for its employees; likewise the FAA must support the different programs needed by smaller carriers with limited funds. Programs like the ones being managed by WBAT and ASIAS. These programs would be cost prohibitive for the smaller service providers to develop and maintain on their own, yet they are essential to the SMS program.

The services of UTRS and Mitre, already in place, must respond to the additional requirements, evolve and expand to shared data capabilities to both large and small service providers. We can then all learn from each other, no one has a patent on Safety. This type of cooperative partnership is the only way this system will work. We must promote open exchange of safety information in order to continuously improve aviation safety. SMS is not a “Silver Bullet” but it is the next step in the evolution of Aviation Safety. [11.1]

A. Operations and Training Comments:

- 1) Group agrees that other government agencies with experience in safety should be involved. Security, however, is nearly a polar opposite from safety in terms of openness and information sharing and integrating the two under a single program would likely result in significant challenges.
- 2) The SMS rule should allow every operator to comply with the requirements using its own resources. Additionally, the use of third parties to assist in compliance is also valuable and should be retained.

6.20.10 From the Regional Airline Association: The FAA guidance material needs to point out that FAA’s oversight of an air carriers SMS program is limited to the air carrier’s operational processes. When fully implemented many operators may utilize the SMS processes to substantiate decisions that affect not only their aircraft operations but could include decisions affecting the health of office employees and financial viability of their company, as well. Most air carriers are presently utilizing SMS techniques in managing ramp safety. Ramp safety like many of a companies personnel injury prevention programs has been primarily the jurisdiction of OSHA. FAA’s oversight of an air carrier’s has traditionally been focused on ensuring compliance with the operating rules and we would expect that adoption of a SMS rule would not expand on their current oversight responsibilities.

The FAA guidance material should elaborate on FAA’s role in integrating the various SMS’s industry partners particularly with FAA’s Air Traffic Control (ATC) Two major components of a SMS analysis are the corrective action and follow up process to ensure that the corrective action is effective. An operator will undoubtedly conduct an analysis that will point out that another industry partners such as FAA ATC, manufacturer or repair station is in a better positioned to perform a corrective action that address the airline’s safety concern. The guidance material for SMS should describe the process of transferring data between industry partners to ensure accountability and effective corrective actions for identified safety hazards. [22.1]

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A. Operations and Training Comments:

- 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - a) Yes.
- 2) Is it valid to the discussion? Yes or no
  - a) Yes.
- 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
  - a) Yes. The rule must be operationally oriented, so that it only addresses the areas currently subject to FAA oversight.
- 4) Is it a scope related comment? Yes or no
  - a) Yes. As in the Delta Airlines' comments, it again points out that it will be difficult to regulate the interfaces between the various related organizations' SMS.

6.20.11 From Omni Air International: We believe this raises an important issue not contemplated in the ANPRM: safety management systems are not new, nor are they unique to the aviation industry. The fundamentals of system safety and safety management systems have long been established and developed across many industries from manufacturing to service industries. To contemplate rulemaking, or for that matter, legislation as the House of Representatives have done, based exclusively on the guidance published by the United States Federal Aviation Administration in an Advisory Circular and locking all air carriers into a single regulatory Safety Management System model will likely discourage the adoption of safety management system innovations developed outside the industry.

In lieu of the a single definition of a "Safety Management System", we believe that the interest of aviation safety would be better served by the further development of resources and guidance that enables and encourages an operator to assess the unique risks posed by the types of operations it contemplates and allows an operator to adopt practices from within the commercial air transport industry as well as those that are constantly evolving in other industries. We would encourage the FAA to look beyond the borders of the United States and recognize that there are standards and recommended practices already developed and implemented across the globe that are superior to those that have been developed by the FAA. We would also encourage the regulators to review their apparent single- minded focus on their own model programs and consider the possibility that an Aviation Safety Action Program (ASAP) is only one model for confidential reporting of safety concerns; that Flight Operations Quality Assurance (FOQA) is only one model for flight data analysis. While a single model facilitates the FAA's oversight activities, it simply reduces these important safety management system elements to the least common denominator and discourages an operator from ensuring that its solution to the risk it has identified (or wishes to identify) meets its unique requirements.

While Omni supports, in principle, the concept of rulemaking to ensure conformity to the already agreed requirements of the International Civil Aviation Organization (ICAO), we strongly believe the FAA should tread carefully in its rulemaking efforts to require



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operators to implement the FAA's Safety Management System (single model) and instead focus on recognizing that there can be a variety of methods to implement safety management systems. We believe that, just as commercial aviation is a global enterprise, so too must any rulemaking relative to safety management systems conform to internationally recognized practices and cannot stand alone as a uniquely "American" program. [83.1]

A. Operations and Training Comments:

1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)

a) Yes

2) Is it valid to the discussion? Yes or no

a) Yes

3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?

a) Yes, voting for increasing the flexibility of implementing the SMS

4) Is it a scope related comment? Yes or no

a) Yes, not require implementing a single model SMS, but recognize a variety of methods to implement an SMS for air carriers.

6.20.12 From the Aviation Safety Council of Alaska (ASCA): Care must be taken to scale the SMS requirements to the size of the company. The way in which the AC 120-92 and other documents are written indicate that a full time safety officer would be required in order to comply with the requirements. A company with three employees and two airplanes cannot dedicate the financial and personnel resources to SMS like a larger company can.

Any SMS program should start at the top and require the upper management to clearly understand, wholeheartedly accept and implement the program. If that cannot be achieved all the good intentions of an SMS will be most likely be unsuccessful.

All safety-related data obtained from individuals must be protected from punishment by the company and/or the judicial system if it is to be effective. Employees should be able to submit safety information without fear of reprisal. All existing Safety Management Systems world-wide require non-punitive and anonymous policies. The first time an employee is punished it will be the last time he ever submits a hazard report. In all likelihood his peers will also cease to participate. Legal protections must be in place for the system to work.

The Medallion Foundation Shield program methodology of providing tools, training, and mentoring are much needed in the transition period to SMS implementation. [71.1]

A. Operations and Training Comments:

The group believes that the commenting party's concerns are clearly addressed through both SMS policy and guidance. Through the construct of these program

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facets, SMS is inherently scalable, free of punitive practices or policy, provides adequate data protections.

- 6.20.13 From Chantilly Air, Inc: Chantilly Air, Inc. asks FAA to assist that part of the industry that operates internationally with rapid implementation of an SMS rule. Chantilly Air, Inc. recommends that, while a final rule is developed, FAA find a way, acceptable to ICAO, to recognize those U.S. operators who have already implemented an SMS based on accepted standards. In Chantilly Air, Inc.'s experience, acceptable standards are those developed by IBAC's IS-BAO, or NATA's ACSF. Such recognition would allow U.S. operators to operate outside of U.S. domestic airspace in compliance with current ICAO mandates.

Chantilly Air, Inc. recommends that FAA rapidly develop an SMS rule. That rulemaking is urgent for those U.S. operators that operate in international airspace, and therefore have to comply with ICAO member states' SMS rules.

Chantilly Air, Inc. furthermore recommends strongly that FAA accept, in its rule, recognize existing SMS standards. Chantilly Air, Inc. understands that the Bermuda Department of Civil Aviation, and the European Aviation Safety Agency (EASA), now accept the International Standard for Business Aircraft Operations (ISBAO) as fulfilling the ICAO SMS requirement. Chantilly Air, Inc. urges FAA to follow suit: the IS-BAO standard is well-developed, well-supported, and used by large numbers of domestic and international operators. Similarly, NATA's ACSF standard provides a similar, albeit internationally less well-recognized, alternative. Recognizing such existing standards would speed up the development and implementation of an SMS rule, and lead to known, and quantifiable, quality outcomes.

In addition, Chantilly Air, Inc. argues that the SMS rule be broadened to include 14 CFR Part 91 operators of large or turbine-powered aircraft, 14 CFR Part 91 corporate aviation operations, and – most importantly – 14 CFR Part 91 Subpart K program managers, to allow for a substantially equivalent level of safety for experientially similar product and service providers. [81.1]

A. Operations and Training Comments:

All U.S. commercial operators face this challenge today. Strongly agree with commenter on a needed interim solution for operators that conduct international operations. FAA should recognize/document voluntary programs in place today.

Addressed 91K yesterday in applicability and they would conceivably be covered.

- 6.20.14 From Frontier Alaska: Care must be taken to scale the SMS requirements to the size of the company. The way in which the AC 120-92 and other documents are written indicate that a full time safety officer would be required in order to comply with the requirements. A company with three employees and two airplanes cannot dedicate the financial and personnel resources to SMS like a larger company can.

Any SMS program should start at the top and require the upper management to clearly understand, wholeheartedly accept and implement the program. If that cannot be achieved all the good intentions of an SMS will be most likely be unsuccessful.

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All safety-related data obtained from individuals must be protected from punishment by the company and/or the judicial system if it is to be effective. Employees should be able to submit safety information without fear of reprisal. All existing Safety Management Systems world-wide require non-punitive and anonymous policies. The first time an employee is punished it will be the last time he ever submits a hazard report. In all likelihood his peers will also cease to participate. Legal protections must be in place for the system to work.

The Medallion Foundation Shield program methodology of providing tools, training, and mentoring are much needed in the transition period to SMS implementation. [67.1]

A. Operations and Training Comments:

- 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - a) Yes.
- 2) Is it valid to the discussion? Yes or no
  - a) Yes.
- 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
  - a) Yes.
  - b) -Does not require a full-time safety manager.
  - c) -Needs commitment from upper management.
  - d) -Non-punitive reporting must be part of effective SMS
- 4) Is it a scope related comment? Yes or no
  - a) Yes.

6.20.15 From Treyfect, Inc.: The OSHA Voluntary Protection Program (VPP) is an excellent example of cooperative programs aimed at assisting businesses (large and small) in assuring work place safety. Likewise, the FAA Diamond Award seeks to recognize achievements in aviation maintenance. Treyfect recommends that similar cooperative programs and recognition incentives are developed to encourage SMS implementation. [23]

A. Operations and Training Comments:

- 1) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - a) No
- 2) Is it valid to the discussion? Yes or no
  - a) No
- 3) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?

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a) No

4) Is it a scope related comment? Yes or no

a) No

#### 6.20.16 Other Comments

- A. From Bombardier Aerospace: Bombardier has a longstanding reputation for its commitment to aviation safety; it fully understands the benefits of implementing SMS and supports its development in the U.S., Canada and around the world.

Bombardier believes that harmonization of ICAO, TC, FAA, EASA, and other regulators' requirements are critical to the overall success of SMS. Bombardier is an advocate of the FAA AVS-SMS International Collaboration and Industry Outreach Program, to encourage regulatory agencies to not apply conflicting expectations on companies operating in different countries and thereby subject them to multiple audits / assessments serving the same objective.[44.2]

1) Operations and Training Comments:

The group concurs with the commenting party's assertions.

- B. From the Aviation Suppliers Association (ASA): There is no particular safety concern driving immediate implementation of SMS. Rather, SMS is viewed as the next tool for preserving safety within the aviation industry.

Because SMS is a good idea that is not yet needed, a voluntary approach to formal implementation of SMS would permit the FAA and industry to more easily modify the SMS program to drop those elements that are seen as impediments to safety, to impose by regulations those elements that are identified as essential to safety, and to encourage voluntary adoption of those elements that reflect useful paradigms, but that may not be necessary to every safety management system.

The threat of enforcement action is not necessary in order to achieve positive regulatory results.

The FAA's VIDAP program carries no penalties and few regulatory incentives, but it has been lauded as a positive force in aviation safety. The only penalty associated with this program is the threat of revocation of accreditation, but the marketplace has made this threat a viable mechanism for assuring continued compliance.

A similar example is the accreditation programs of voluntary organizations such as Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC). This program carries no penalties beyond revocation of accreditation. Nonetheless, the 770 companies, universities, hospitals, government agencies and other research institutions in 31 countries that have earned AAALAC accreditation take it very seriously and compliance rates with the AAALAC standards are excellent.

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The EPA Energy Star program is another example of a government program that has achieved substantial results with modest incentives and no penalties.

Another government program that has no regulatory force but has been a significant instrument of compliance to standards is the National Institutes of Health (NIH) Recombinant DNA Guidelines, which have no regulatory force but are carefully followed by research universities.

These examples show that voluntary guidelines can have a significant effect on an industry in order to promote change. And the benefit of these voluntary guidelines is that it is significantly easier to design a program that is targeted to meeting the program's goals (aviation safety, in our case) when the system is flexible enough to permit the company to develop new ideas with the support of a government agency without fear that improper implementation will lead to punitive action. [70.1]

1) Operations and Training Comments:

Agree that the SMS requirement would not apply to non-regulated activities and entities.

6.20.17 Northern Air Cargo: Care must be taken to scale the SMS requirements to the size of the company. The way in which the AC 120-92 and other documents are written indicate that a full time safety officer would be required in order to comply with the requirements. A company with three employees and two airplanes cannot dedicate the financial and personnel resources to SMS like a larger company can.

Any SMS program should start at the top and require the upper management to clearly understand, wholeheartedly accept and implement the program. If that cannot be achieved all the good intentions of an SMS will be most likely be unsuccessful.

All safety-related data obtained from individuals must be protected from punishment by the company and/or the judicial system if it is to be effective. Employees should be able to submit safety information without fear of reprisal. All existing Safety Management Systems world-wide require non-punitive and anonymous policies. The first time an employee is punished it will be the last time he ever submits a hazard report. In all likelihood his peers will also cease to participate. Legal protections must be in place for the system to work.

The Medallion Foundation Shield program methodology of providing tools, training, and mentoring are much needed in the transition period to SMS implementation. [73.1]

1) Operations and Training Comments:

- a) Is it valid to the SMS rule? Yes or no (Note: Is it realistic and achievable)
  - i) Yes.
- b) Is it valid to the discussion? Yes or no
  - i) Yes.

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- c) Are there parts of the comments that are more relevant than others? Are there exceptions? If yes, what?
    - i) Yes.
    - ii) -Does not require a full-time safety manager.
    - iii) -Needs commitment from upper management.
    - iv) -Non-punitive reporting must be part of effective SMS
  - d) Is it a scope related comment? Yes or no
    - i) Yes.

6.20.18 From a Retired FAA Employee whose background includes 27 years of service with the FAA and served as: the Director of the FAA Aircraft Certification Service; FAA Associate Administrator for Regulation & Safety; and Industry Chair of the FAA Certified Design Organization Advisory Committee: The ICAO and FAA SMS principles formed the basis of SMS discussions in the CDO ARC. The ARC very quickly arrived at the notion of regulating the four general principles of SMS, frequently referred to as the SMS Pillars. The principles under the four pillars are very generic, though, and only define what general principles should be embodied within any company SMS; but, this generality makes consistent and equitable government regulation and oversight very difficult, if not impossible. The ARC spent months debating how it could regulate such broad principles, and how the FAA would be able to effectively and uniformly oversight such a regulation. The ARC focused on the Capability Maturity Model (CMM) concept, and specifically the Integrated Capability Maturity Model (iCMM) developed by the FAA in the 90s. There is also an integrated CMM model developed by Carnegie-Mellon Institute which they refer to as CMMI. All of these are models for managing continuous process improvement, an obvious goal of any safety management system. The models contain processes for measuring an organization's capability to perform its activities and its organizational maturity in performing those activities. The CDO ARC report proposed the FAA iCMM model as an initial and recurrent way of measuring the capability and maturity of a company to properly implement SMS. The iCMM model also provides the necessary definition of what "right looks like" so the industry can properly and efficiently implement SMS.

- A. The below comments describe: Some of the details of the ARC's struggles with regulating SMS, which the FAA is now faced with and was likely one of the reasons for an ANPRM; the simplified SMS standard; How iCMM can be used to measure the proper implementation of the SMS regulation; and how the FAA might regulate the overall iCMM concept.
  - 1) The SMS Regulatory Dilemma – While the principles of SMS are rather intuitive and could be easily implemented as a voluntary program, their regulation poses immense difficulties because the principles are general and difficult to measure.
  - 2) •Even ICAO admits that SMS is a safety culture within an organization. How does the FAA consistently regulate and measure the culture of an organization?
  - 3) •How do you craft a rule that applies to all types and sizes of business organizations, and all types of processes and procedures within a business?

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- 4) •Any given company can have but one SMS since, by definition, SMS must encompass all of its aviation activities. This one SMS must envelope every FAA certificate or approval they have, or are seeking. How will the AVS SMS program be structured so that one SMS will seamlessly meet all the AIR, AFS, AAM, and AAI unique SMS objectives?
  - 5) •FAA must define what “right looks like” so industry knows what they must do to initially and continually comply with the rule. That same “right” must also be used as the basis for any FAA oversight and compliance audits. How is “right” clearly defined and yet have objective SMS standards?
  - 6) •FAA SMS regulatory oversight must be structured so there is a level playing field for all regulated companies that must compete within the same industry segment.
  - 7) •How will the FAA conduct its surveillance so that it measures a company against given, objective criteria, without personal, office, or regional bias?
- B. The SMS General Rule – The ARC proposed a general SMS rule that embodied the four SMS precepts or pillars. These same safety principles are addressed within Notice 09-06.
- 1) I believe it is necessary and appropriate for the FAA to regulate the most basic objective criteria for SMS. This enables the industry to implement SMS within a company in the manner that best fits its culture and processes, yet gives some regulatory measure of what must be contained within the SMS. The rule proposed by the ARC is as follows:
    - 2) A certificate holder must maintain a safety management system (SMS) that incorporates the following:
      - 3) (a)Safety Policy that –
        - 4) (1)Defines the SMS goals and objectives,
        - 5) (2)Defines how the organization will implement the SMS to attain the goals and objectives of (a)(1),
        - 6) (3)Establishes senior company management's commitment to safety management and an expectation of high safety performance, and
        - 7) (4)Commits to a process-based approach to safety promotion within the company.
      - 8) (b)Safety Risk Management processes applied to safety systems; compliance processes; product, part, and appliance designs; and production or in-service events, that are performed as follows:
        - 9) (1)Describe the system of interest;
        - 10) (2)Define the hazards associated with the system defined in (b)(1);

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- 11) (3) Analyze the safety risk of identified hazards, characterizing the likelihood and severity of each hazard;
  - 12) (4) Assess the safety risk and incorporate that assessment into its decision-making processes; and
  - 13) (5) Control, mitigate, or eliminate that safety risk consistent within established FAA airworthiness standards through the implementation of programs, processes, or product redesign.
  - 14) (c) Safety Assurance processes that –
  - 15) (1) Monitor the implementation of the safety policy;
  - 16) (2) Assess safety systems; compliance processes; product, part, and appliance designs; and production or in-service events, to identify new or potential hazards;
  - 17) (3) Analyze those assessments as part of its risk management program; and
  - 18) (4) Continually ensure appropriate safety risk controls are effective for those hazards, based on their safety consequence and likelihood of occurrence.
  - 19) (d) Safety Promotion processes that implement the actions necessary to create an environment within the CDO where safety objectives can be achieved and maintained. Those actions must include –
  - 20) (1) A program to ensure people are appropriately qualified to perform the necessary safety analysis and use the SMS principles when making safety decisions,
  - 21) (2) A clear definition of what actions are acceptable and unacceptable in the workplace with respect to the reporting of safety issues,
  - 22) (3) A program for safety information sharing within the organization to ensure lessons learned are available to others doing the same or similar tasks, and
  - 23) (4) A periodic review of the safety management program to ensure that the defined processes are achieving their desired outcomes.
- C. Capability Maturity Modeling – Since the FAA has already invested much time and money into the development of iCMM, and it appears to be an acceptable tool for measuring organizational behavior, I am suggesting that it be used to evaluate the proper implementation of SMS within those companies regulated by the FAA. I believe each company should be allowed to implement SMS however it best works for them, as long as the basic SMS and iCMM principles are complied with. These SMS and iCMM principles define what must be implemented. How the SMS and iCMM principles are implemented should be up to the company. Below is a snapshot of the iCMM principles embodied in the manual for Version 2.0 of the FAA Integrated Capability Maturity Model. That document is submitted as an attachment to the electronic submittal of these comments to the docket, and it is requested that the FAA iCMM Model manual be placed in this docket, and on the AVS web site for easy public access since it is a public document.



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D. The Process Dimension – There are three basic process areas and one special application area within iCMM. They are grouped as follows:

- 1) Management
  - a) PA 00 – Integrated Enterprise Management
  - b) PA 11 – Process Management
  - c) PA 12 – Supplier Agreement Management
  - d) PA 13 – Risk Management
  - e) PA 14 – Integrated Teaming
- 2) Life Cycle
  - a) PA 01 – Needs
  - b) PA 02 – Requirements
  - c) PA 03 – Design
  - d) PA 06 – Design Implementation
  - e) PA 07 – Integration
  - f) PA 08 – Evaluation
  - g) PA 09 – Deployment, Transition, and Disposal
  - h) PA 10 – Operation and Support
- 3) Support
  - a) PA 04 – Alternatives Analysis
  - b) PA 05 – Outsourcing
  - c) PA 15 – Quality Assurance and Management
  - d) PA 16 – Configuration Management
  - e) PA 17 – Information Management
  - f) PA 18 – Measurement and Analysis
  - g) PA 19 – Work Environment
  - h) PA 20 – Process Definition
  - i) PA 21 – Process Improvement
  - j) PA 22 – Training
  - k) PA 23 – Innovation

Each of the process areas is thoroughly discussed within the FAA iCMM Model manual. For each process area there is a well defined purpose, major discussion points, goals, and best practices. The report also provides a detailed definition of each best practice and a discussion of typical work products contained within that

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best practice. These processes areas encompass all the functions and activities that any successful company most likely would already possess, to some degree, within their operating systems.

Their imposition as a regulatory requirement would not pose unreasonable burdens, even though many companies might be required to make these practices more robust and safety focused. The implementation of these iCMM principles should be no more complicated than ISO 9000 series QMS, Six-sigma, or other concepts already voluntarily adopted by the aviation industry. These existing management principles can easily be integrated with SMS and iCMM concepts, to form one cohesive management system within a company. That would enable the industry to retain what is working well, and improve those safety management systems and processes that warrant improvement. This method of SMS and iCMM regulation is more evolutionary in nature, and would likely not have the initial start-up problems associated with more revolutionary safety processes. With the entire safety system being highly interdependent and state-of-the-art as it is today, unproven new safety systems could introduce unintended safety risks.

- E. The Capability Dimension – The FAA iCMM Model manual defines five capability levels that are based on “widely observed plateaus of performance that organizations typically achieve as they strive to improve their business processes.” Each capability level is described in the following general format:

- Number and title
- Summary description
- Goal for that level
- General criteria
- Generic practice statement, including relationship to other generic practices and process areas

The five capability levels are defined as follows.

- 1) Level 1 Performed - A performed process is one being carried out, resulting in processes and services being provided to a customer. The products and services are generally adequate, but quality and efficiency may vary depending on individual knowledge and effort. The capability to perform properly is not generally transferable to other processes.
- 2) Level 2 Managing the Process - A managed (planned and tracked) process is one performed, planned, and carried out according to a documented plan and process description. The plan identifies specific objectives for the process, such as customer satisfaction, cost, schedule, compliance, or quality objectives. There are adequate resources, skilled practitioners, clear responsibilities, controlled work products, performance measured against plan, and concrete actions taken, including improving the process being performed.

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- 3) Level 3 Defined – A defined process is a managed, planned, and tracked process that is tailored for the organization’s set of standard processes. The standard processes are established to meet business objectives and are based on the organization’s knowledge and experience. Measures and process improvement information are stored in an organizational repository so that process knowledge is shared across the organization. The standard processes and defined processes are improved and deployed across the organization.
  - 4) Level 4 Quantitatively Managed – A quantitatively managed process is one that is controlled using quantitative techniques. Very specific objectives, measures, and processes are selected for quantitative management. The capability of the process (range of expected results or ability to achieve a goal) is understood statistically; special causes of variation are eliminated; performance is stabilized within defined control limits. Actual, achievable business and performance levels are understood.
  - 5) Level 5 Optimizing – An optimizing process is a quantitatively managed process that is changed and adapted to meet relevant current and projected business objectives. Changes are introduced to the specific processes that are under statistical control to attempt to shift performance levels to ever-stretching target levels set by the organization. Changes are through: removing common causes of variation; or introducing new technology.
- F. The Maturity Dimension – The maturity level of an organization is a measure of how effectively it is in managing the never-ending process of organizational maturity and change. It measures how certain process areas are implemented, or staged, within a company. The concept of staging provides guidance as to what process areas might be pursued together, or which processes normally precede other processes. Any defined maturity level includes the staging of processes defined for that level, plus those defined for other lower levels of maturity. Defining specific maturity levels permits benchmarking with other parts of the organization, and enables a summary rating for an overall organization’s process maturity, or the overall maturity within a given element of an overall organization. For instance, for an air carrier it would allow the definition of a maturity level for operations, dispatch, maintenance, etc. This allows for the identification of needed improvements by the air carrier and the FAA in specific areas, without biasing the performance of the whole organization by deficiencies in one area.

There are five maturity levels.

- 1) •Maturity Level 0 & 1 – These levels are very immature and are not specifically defined.
- 2) •Maturity Level 2 – Managed: Planned and Tracked – There are 9 process areas staged at this level of maturity. All process areas must satisfy capability levels 1 and 2
- 3) •Maturity Level 3 - Defined – An additional 11 process areas are staged. The accumulated 20 process areas must all satisfy capability levels 1, 2, and 3.

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- 4) •Maturity Level 4 - Quantitatively Managed – In addition to the level 3 staging, selected processes must satisfy capability level 4.
- 5) •Maturity Level 5 Optimizing Level – One additional process area, Innovation, is staged. All 21 process areas must satisfy capability Levels 1, 2, and 3. Selected Process Areas must additionally satisfy capability levels 4 and 5.
- G. CMM Regulation – I believe the next step in an SMS regulatory program is to mandate the CMM approach to managing the SMS within a company. Like what was proposed within the CDO ARC, I believe the regulation should require level 3 capability and maturity, and the below suggested regulatory language contains generic descriptors for level 3 capability and maturity.

(a)The certificate holder must demonstrate and maintain the capability to perform the required processes and procedures in a documented and consistent manner that meets SMS standards. The processes and procedures must be managed so that their goals are met. Standard company processes must be used; individual processes may be created from standard processes if they are approved in accordance with a company process contained in the SMS procedures manual.

(b)The certificate holder must demonstrate and maintain the organizational maturity necessary to consistently perform at the capability defined in (a) across the breadth of the process and product lifecycle.

I recommend that the CMM regulation also contain an appendix that defines the process areas and their goals, as defined within the FAA iCMM Manual. This would still be generic in nature, allowing the maximum flexibility within the industry to comply with FAA regulations. The process area best practices should be guidance material and not a regulation. This is because best practices will certainly mature within a company as a result of their internal assessments required by the SMS regulation. To regulate these best practices would likely stifle safety innovation. But, a company should be asked to explain why they believe their practices are more appropriate than the best practices recommended by the FAA in meeting the requirements in the appendix for the process areas. This is to ensure there was sound logic and reasoning behind the company practices deviating from what the FAA perceives to be industry best practices.

There should also be AVS-wide generic guidance material, which is essentially the material contained in the existing FAA iCMM Model manual.

At this point in the AVS hierarchy of regulatory requirements and policy, all the material is still generic and applicable to any size company whose business is regulated by the FAA. As stated before, this is essential since many companies hold multiple FAA certificates or approvals, issued by different organizations within AVS. Any certificate or approval holder must be able to implement a single company-wide SMS that operates according to the same generic principles, and complies with AVS SMS regulations, regardless of whether a particular certificate or approval they hold is from AIR, AFS, or AAM. I believe (and so did the CDO ARC) it is essential that SMS requirements not be triggered by the holding or pursuit of specific approvals or

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certificates. That is, there should not be an SMS regulation issued by AIR for design approvals, another issued by AIR for production certificates, another issued by AFS for air carriers operating under Part 121, another for holders of repair station certificates, etc. Also, a company holding different approvals or certificates should not be subjected to oversight by different AVS organizations, with different definitions of what “right looks like” with respect to compliance with AVS generic SMS regulatory principles. It is a commonly accepted principle that a company should have one SMS that encompasses all of its safety functions. It would be chaotic to have multiple systems within a company because of multiple objectives for SMS coming from different parts of the AVS organization.

In summary, I recommend an AVS-wide, single SMS rule, an AVS-wide single iCMM rule and appendix, and AVS-wide generic guidance material, that form the basis of any SMS implementation within AVS organizations. This is certainly doable under the concepts I have discussed above.

- H. Office/Service SMS Implementation – There is a need for more specifics and clarity to be provided by each organization within AVS as SMS principles are applied to certificate and approval holders they regulate and oversee. Specificity can be provided for each certificate, approval, of activities within those certificates or approvals. That specificity would constitute guidance as to how the process areas would be implemented for each specific activity. Such things as how each process area description, work products, and best practices would be executed for a specific process area and company activity would be specified. How this is accomplished is best explained with the use of an example.

Consider the holder of a repair station certificate. There are specific general activities that most repair stations would accomplish, such as supplier control, and there may be unique ones that only certain types of repair stations accomplish. Each of those activities would be required to perform at capability and maturity level 3. That means that the 21 process areas defined within the generic AVS regulation must satisfy capability levels 1, 2, and 3, or not be appropriate process areas for repair station activities. AFS, working with input from industry, should define how each of those process areas would function within the typical repair station.

One of the applicable process areas is Supplier Management, whose purpose (defined in the iCMM Model manual) is to ensure that the activities described in supplier agreements are being performed, and the evolving products and services will satisfy requirements defined in those agreements. AFS guidance could include a list of those regulations that relate to supplier management, those materials that must be provided by the repair station to the FAA to meet data submittal requirements, a list of those records that would typically be required to demonstrate proper supplier management, etc. In addition, AFS guidance could be provided on the best practices used to manage suppliers, and any unique features that must be included in that supplier management for certain types of suppliers, such as those supplying materials with defined shelf lives. Similar details would be provided for all the other process areas that reflect how those process areas would apply to typical repair station activities.

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This unique activity-specific guidance is at the heart of SMS implementation, and probably would constitute the largest volume of FAA guidance. While meeting the overall AVS guidance, it would be specific to identified activities regulated by AVS organizations. Having this detailed guidance would assist the industry in properly meeting the general AVS SMS, but would not be overly burdensome for those companies that hold multiple AVS certificates or approvals since common AVS guidance would form the basis for the detailed guidance. The detailed guidance from different AVS organizations would complement each other, rather than run the risk of conflicting with each other.

Existing FAA guidance and internal work products and FAA orders could be used to create most of the needed detailed guidance under iCMM, by simply restructuring how the material is presented. It is recommended that the FAA include industry and industry groups in the development of specific guidance on how iCMM process areas are applied to common industry activities. A contractor or series of contractors could be hired by the FAA to implement the development of guidance, using rolling panels or other effective methods of gaining industry and FAA office inputs. That would eliminate the need for FAA advisory committees that would make this process cumbersome and unnecessarily lengthy.

#### 6.20.19 Comments outside the ANPRM Scope

It is hoped that these comments, while outside the scope of the ANPRM, would be considered by the FAA in its overall deliberations under SMS. The SMS and iCMM principles discussed above can also be applied to the AVS organization and how it functions in meeting the ICAO requirement for it to operate under SMS principles. Being generic with respect to size and type of organization, iCMM principles can easily be implemented within AVS, much as EUROCONTROL has done with CMMI. Furthermore, there is no reason the same SMS and iCMM principles cannot be used to form the basis for SMS regulations within Airports, Environment & Energy, and even Commercial Space. The detailed guidance in each of these other FAA organizations would be different, but the basic SMS and iCMM regulatory principles could be identical to what I have recommended for AVS. [28.1]

#### A. Operations and Training Comments:

Other: Recommendation to the FAA to review the CDO ARC content prior to excluding this from the comment criteria.

**APPENDIX B – MAINTENANCE WORKING GROUP REPORT**

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# **FAA SMS ARC MAINTENANCE WORKING GROUP REPORT**

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Prepared: March 19, 2010

Revision: 02



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## Table of Contents

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<u>Description</u>	<u>Page</u>
Table of Contents .....	2
Section 1: Introduction .....	3
1.1 Overview .....	3
1.2 FAA Questions .....	3
1.3 Approach .....	4
Section 2: FAA Questions .....	5
2.1 Should the FAA issue regulations on SMS? (Why or Why not?).....	5
2.2 Who should SMS regulations apply to? (Why or Why not?).....	6
2.3 What should the SMS regulations address?.....	7
2.4 What should the guidance material address?.....	9
2.5 Explanation of the SMS ARC recommendations .....	9
Attachment A – Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR	
Attachment B – ANPRM Question Summaries	

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## Section 1: Introduction

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### 1.1 Overview

1.1.1 The Safety Management System (SMS) Aviation Rulemaking Committee (ARC) Maintenance (Mx) Working Group (WG) was comprised of 25 members representing maintenance organizations from repair stations, manufacturers, operators, and the Federal Aviation Administration (FAA).

1.1.2 The team met numerous times in person, held multiple teleconferences, and communicated heavily via electronic mail.

### 1.2 FAA Questions

1.2.1 The FAA requested the Mx WG to review the responses to the Advance Notice of Proposed Rule Making (ANPRM) and provide recommendations based on five questions posed to the ARC:

1.2.1.1 Should the FAA issue regulations on SMS? (Why or Why not?)

1.2.1.2 Who should SMS regulations apply to? (Why or Why not?)

1.2.1.3 What should the SMS regulations address? Describe concepts, and if necessary to convey a concept, provide example regulatory text. Please note that this language will be subject to FAA revision.

1.2.1.4 What should the guidance material address? Describe general concepts (details of guidance will be addressed in a future ARC recommendation).

1.2.1.5 Explanation of the SMS ARC recommendations.

- Justification (reasoning) for rule change.
- Explanation of benefits (and any data you have to support these benefits).
- Explanation of costs (and any data you have to support these costs).
- Harmonization with international standards

1.2.2 The recommendations should be formed by review of the comments received on the ANPRM, but are not limited to the scope of the ANPRM. The recommendations will be published in the docket. The specific language in the ARC Charter follows:

*“Provide recommendations based on public comments to an Advance Notice of Proposed Rulemaking (ANPRM) and other issues the FAA may want the ARC to consider.”* The ARC will review and provide recommendations to the FAA after considering the relevant public comments to the ANPRM. The FAA may also submit additional issues for the ARC to address that were not part of the ANPRM. Provided the FAA decides to proceed with rulemaking, the ARC’s recommendations will be considered by the FAA in its preparation of a Notice of Proposed Rulemaking (NPRM). The ARC may submit its recommendations in a single report using any desired format. The FAA may deem it

necessary to develop specific tasks based on an analysis of the ANPRM public comment results.

## 1.3 Approach

- 1.3.1 The Mx WG took an analytical approach to answer the questions presented by the FAA.
- 1.3.2 First, a Gap Analysis of FAA Order VS 8000.367 Appendix B to the existing Title 14 Code of Federal Regulations (CFR) was prepared (see Attachment A). The analysis was subsequently reviewed and updated by a sub-team of the Mx WG.
- 1.3.3 Second, the Mx WG divided into four sub-teams. Each sub-team was assigned four of the ANPRM questions and prepared a summary of the complex answers based on the public comments (see Attachment B).
- 1.3.4 Finally, the entire team met to review and finalize the results of the first two steps and prepare the recommendations/report to the FAA.
- 1.3.5 During the entire process, the Mx WG worked under the following assumptions:
  - 1.3.5.1 Safety – The state in which the risk of harm to persons or property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of [aviation] hazard identification and risk management.
  - 1.3.5.2 Hazard – Any existing or potential condition that can lead to injury, illness, or death to people; damage to or loss of a system, equipment, or property; or damage to the environment. A hazard is a condition that is a prerequisite to an [aviation] accident or incident.
  - 1.3.5.3 The FAA's jurisdiction over maintenance operations is limited to the airworthiness of the article; it does not include environmental and occupational health and safety.
  - 1.3.5.4 There must be industry consensus on the Safety Risk Management (SRM) model. The model must include a feedback loop, so that any report of a hazard, whether internal or external, is treated the same.

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## Section 2: FAA Questions

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### 2.1 Should the FAA issue regulations on SMS? (Why or Why not?)

2.1.1 Before the Mx WG could answer this question, it had to ask what problem the industry is trying to resolve with the introduction of SMS. Last year's accident rate for Western-built jet aircraft was the second lowest in aviation history, according to the International Air Transport Association (IATA). The global accident rate of 0.71 (measured in terms of hull losses per million flights) equates to one accident for every 1.4 million flights.

The accident rate marked an improvement over 2008 (0.81, or one accident for 1.2 million flights) and was 36 percent better than the accident rate in 2000. The lowest rate in history - 0.65 - was recorded in 2006.

IATA reports that 2.3 billion people flew safely on 35 million flights last year. There were 19 accidents involving Western-built aircraft, down from 22 accidents in 2008. There were a total of 90 accidents involving all aircraft types, which included 18 fatal accidents and 685 fatalities.

"Safety is the industry's number one priority. Even in a decade during which airlines lost an average of \$5 billion per year, we still managed to improve our safety record," stated the IATA Director General and Chief Executive Officer (CEO) Giovanni Bisignani. "Last year, 2.3 billion people flew safely. But every fatality is a human tragedy that reminds us of the ultimate goal of zero accidents and zero fatalities."

Furthermore, we cannot lose sight of the existing regulatory cycle:

- The granting of a Type Certificate (TC) means the FAA has found the design of products to be safe; step one in the airworthiness cycle.
- The Production Certificate (PC) means that the Production Approval Holder (PAH) can produce the safe product and parts thereof consistently; step two in the airworthiness cycle.
- The air carrier is required to operate within the safe system and follow its Continuous Airworthiness Maintenance Plan; step three in the airworthiness cycle.
- The repair station is driven through 14 CFR §43.13 to maintain the articles and return them to their certificated or properly altered condition; step four in the airworthiness cycle.

2.1.2 The Mx WG held strong views both for and against a regulation requiring SMS; the split viewpoints were based upon the difference in the size and complexity of each maintenance operation. Recognize that SMS provides a system's approach to managing safety, including the necessary organizational structures, accountabilities, policies, and procedures.

Smaller organizations, while recognizing the use/value of SMS, do not understand the need for another management system and supporting regulations, and preferred a voluntary system. The team recognized that smaller organizations currently have less of an understanding of SMS and their responses may reflect fears of the unknown. Nevertheless, the industry's safety record leads to concerns over administrative costs

exceeding any measureable safety gains that may be achieved. It should be noted that as of January 2010, there were 4,122 US domestic repair stations. Of that total, 2,113 have 10 employees or less.

Larger organizations view the implementation of an SMS as an invaluable tool and do not have issues with the development/implementation of associated regulatory requirements. They find an SMS to be compatible with their existing Quality Management System (QMS) and Continuing Analysis and Surveillance System (CASS). The whole team agreed that many elements of an SMS are already part of a QMS and that it is a formal identification and management of risks. SMS was collectively viewed as the next step in the evolution of industry safety regulations and processes. One team member identified that SMS puts prioritized issues in front of the FAA.

2.1.3 The Mx WG also accepted that there are international pressures for harmonization across regulatory authorities and that a voluntary system may not be recognized. To be effective SMS requires international harmonization. Failure of the FAA to establish an SMS rule in a timely manner, may force organizations to implement systems designed and required by other National Aviation Authorities (NAA). This will most likely lead to multiple interpretations of what constitutes an SMS. International business operations are already affected because certain NAAs have already defined their regulations and deployment schedule, and some are already checking for an implemented SMS.

2.1.4 The Mx WG expressed concern with regulatory compliance. SMS may be a complex or simple system. This may lead to Aviation Safety Inspector (ASI) interpretations that are not equitable. So how will SMS be enforced, if required? One method suggested was there may be a system of data collection tools, Safety Attribute Inspections (SAI) and Element Performance Inspections (EPI), specifically designed for SMS.

If an SMS rule is implemented 14 CFR part 145 agencies desire the SMS requirements to be inclusive in existing regulations. This would retain the single cookbook concept now in place for repair stations. Various part 121 certificate holders raised concerns on how that would work for an organization with multiple certificates. It was noted that an SMS system would be by certificate number, not the whole organization. There must be a method of exception that allows a part 121 operator the ability to take credit for an overarching system at individual part 145 certificates within the same organization. Manufacturers agreed that a similar process would be required for part 145s owned by part 21 manufacturers.

2.1.5 If a system is required, the Mx WG felt strongly that it needs to be simple, part of the way maintenance organizations conduct their business. It must integrate seamlessly into the organization.

2.1.6 The final concern raised by the group was associated to the potential impact of congress legislating an SMS requirement before the FAA and industry take action. If there must be a rule, the maintenance organizations want to have control over their destiny; defining what, when, and how an SMS would be implemented.

## 2.2 Who should SMS regulations apply to? (Why or Why not?)

2.2.1 The Mx WG viewpoints were equally divided on this issue. If a rule is required, two positions were presented.

2.2.2 One position was to only require CFR part 121/135 maintenance organizations and part 145 air agencies that support 121 and 135 operations (those organizations listed on the

Approved Vendor List (AVL) to have an SMS. That is commercial aviation and those that support commercial aviation.

The supporting logic is that SMS is being driven by an International Civil Aviation Organization (ICAO) requirement and therefore should only be applicable to those operations. A voluntary system for SMS implementation could be deployed by all others within the aviation industry.

- 2.2.3 The other position was that every certificated maintenance organization should be included regardless of size, rating, or function.

The logic presented by this group is that the system must pass the “headline” test; that is how can the aviation industry place more value on one life over another?

- 2.2.4 With either position, the implementation must be a phased approach beginning with international commercial operations and concluding with general aviation. Any organization would be permitted to move as quickly as desired; however, they should not exceed the timeframes defined below. These timeframes are what the Mx WG saw as being feasible; if during the implementation process it is discovered that they are not, appropriate adjustments to these proposed schedules should be made.

2.2.4.1 Assuming all guidance is available on the date of the final rule, the effective date of the rule should be one year after the final rule is published. This schedule allows the FAA time to conduct internal training for its ASIs. Actual implementation dates should be tied to certificate dates for leveling the associated industry and FAA work statement; similar to the approach taken for the implementation of part 145 training programs.

2.2.4.2 Part 121 maintenance organizations – effective one year after the final rule with a three year implementation schedule.

2.2.4.3 Part 135 maintenance organizations – effective one year after the final rule with a three year implementation schedule for international operators and five years for all others.

2.2.4.4 Part 145 – effective one year after the final rule with a three year implementation for those organizations supporting commercial aviation and five years for all others.

- 2.2.5 The SMS must be scalable, not based on a lower level of safety; but a lower level of complexity or bureaucracy. The SMS needs to be of the same sophistication as the complexity of business (e.g., seat shop versus airframe class rated shop).

- 2.2.6 SMS cannot be a requirement flowed down by multiple air carriers to a single repair station (145.205). If a part 145 organization is required to have an SMS, that SMS must be acceptable to all air carriers.

## 2.3 What should the SMS regulations address?

- 2.3.1 If there is a regulation, there are two approaches that must be considered.

2.3.1.1 First, 14 CFR part 145 air agencies prefer an imbedded rule. Part 145 is a performance-based rule and as reflected by the Gap Analysis results

(Attachment A), much of the required SMS infrastructure is already in place. An imbedded rule would make SMS transparent to a repair station.

- 2.3.1.2 Second, would be a stand-alone rule applicable for all organizations. This approach may provide organizations with multiple certificates (e.g., part 121 and 145) an opportunity to develop a single system.
- 2.3.2 For either approach, the rule needs to be defined at a high level and it must provide for the protection of proprietary and safety data.
- 2.3.3 Terminology must be clear, consistent, and concise. It should include protection from criminal law suits against company personnel performing SMS duties related to SRM responsibilities.
- 2.3.4 The SMS should be FAA 'accepted' vs. 'approved' or better said: acceptable to vs. approved [same as the Repair Station Manual (RSM)/Quality Control Manual (QCM)]. The program may be developed as a stand-alone manual or incorporated into the existing manual system.
- 2.3.5 In reviewing the requirements, the Mx WG agrees with the elements of the ICAO SMS Framework:
  - 1 Safety Policy and Objectives
    - 1.1 – Management commitment and responsibility
    - 1.2 – Safety accountabilities of managers
    - 1.3 – Appointment of key safety personnel
    - 1.4 – SMS implementation plan
    - 1.5 – Coordination of emergency response planning
    - 1.6 – Documentation
  - 2 Safety Risk Management
    - 2.1 – Hazard identification processes
    - 2.2 – Risk assessment and mitigation processes
  - 3 Safety Assurance
    - 3.1 – Safety performance monitoring and measurement
    - 3.2 – The management of change
    - 3.3 – Continuous improvement of the SMS
  - 4 Safety Promotion
    - 4.1 – Training and education
    - 4.2 – Safety communication
- 2.3.6 The Mx WG strongly feels that consistent regulatory oversight must be implemented to ensure that SMS regulation is interpreted/applied across multiple FAA offices and the diverse sector of product/service providers equitably.

## 2.4 What should the guidance material address?

- 2.4.1 The guidance needs to be complete and in-depth, consistent with approach taken for the Air Transportation Oversight System (ATOS) guidance and tools (SAI and EPI).
- 2.4.2 It should follow the CASS scalable example [see FAA Advisory Circular (AC) 120-79].
- 2.4.3 It should be clear that it can be included in an existing RSM/QSM and does not have to be a stand-alone manual.
- 2.4.4 The FAA should review AC 39-8 and consider the risk assessment model presented.
- 2.4.5 The guidance must be simple, flexible, efficient, and sector specific. Most guidance available to date is operationally oriented and does not adequately address maintenance. Even the most recent ICAO guidance has eliminated maintenance examples previously presented.
- 2.4.6 The guidance should recognize SRM activities that currently exist in industry and provide guidance materials that address the 'overlap' (e.g., International Helicopter Safety Team (IHST) Toolkit, CASS, ATOS, QMS, ISO, IS-BAO).
- 2.4.7 Lessons learned from FAA-Operator Pilot Program experience—
  - 2.4.7.1 Identify what worked and the tangible 'benefits' (e.g., cost/benefits, improved safety).
  - 2.4.7.2 Provide case studies to substantiate SMS implementation and associated regulations.
- 2.4.8 Hazard identification and risk assessment guidance should be specific to a sector/certificate, since SRM and Safety Assurance (SA) are the key functional process of an SMS and could be misinterpreted in SMS application and implementation.
- 2.4.9 SMS Framework expectations for the 'Four Pillars' – Safety Policy, SRM, SA and Safety Promotion - implementation levels (e.g., Level 0, 1, 2, 3).
- 2.4.10 Language that prescribes the SMS defined by the size and complexity of the organization.
- 2.4.11 The SRM model must include a feedback loop, so that any report of a hazard, whether internal or external, is treated the same and the submitter is notified of disposition..
- 2.4.12 The group perceived that current guidance is too academic. It should be simple and in plain English.

## 2.5 Explanation of the SMS ARC recommendations

- 2.5.1 Justification (reasoning) for rule change.
  - 2.5.1.1 The Mx WG does not believe that an SMS rule can be justified on safety improvements alone. As identified in the introduction, safety is at all time highs. There will be no quantum leaps made no matter what system is developed or implemented.



- 2.5.1.2 The biggest reason for implementing SMS is to ensure compliance with ICAO requirements and international harmonization.
- 2.5.2 Explanation of benefits (and any data you have to support these benefits).
  - 2.5.2.1 Larger organizations will benefit “big picture” roll-up data. They will have visibility to “silo” department interactions. Smaller organizations do not normally have the communication problems experienced by large companies; the effect of a safety concern is more evident and customer support is viewed as being more personal.
  - 2.5.2.2 There is a potential for insurance benefits; however, if everyone must have a system the actual benefit may become negligible.
  - 2.5.2.3 A documented system captures the knowledge and experience of employees.
  - 2.5.2.4 Improved employee involvement.
- 2.5.3 Explanation of costs (and any data you have to support these costs).
  - 2.5.3.1 There is a general assumption that the cost benefits diminish as the size of the organization gets smaller.
  - 2.5.3.2 No one provided cost savings data. This may be attributed to the fact that it is hard to determine if the cost savings was directly related to the implementation of an SMS and at this time a limited number of organizations have a mature SMS in place.
  - 2.5.3.3 One large manufacture with multiple repair stations identified that initial implementation costs were approximately \$180 million, with annual recurring costs of approximately \$37 million.

# Maintenance Working Group Report

Page: 11 of 11

Revision: 02

Date: 03/19/2010

2.5.3.4 As defined in the below table, one trade association provided data collected on SMS implementation by thirteen (13) Canadian Aircraft Maintenance Organizations (AMOs). The average start-up cost for a three year plan was \$92,046.00 with annual recurring costs of \$37,159.00. This is with an average of 14 employees.

Company	Employees	Implementation			3 Year Total	Recurring
		Year 1	Year 2	Year 3		
A		\$10,000	\$10,000	\$10,000	\$30,000	\$52,000
B	22	\$16,000	\$10,000	\$5,000	\$31,000	\$3,000
C	6	\$52,800	\$49,500	\$49,500	\$151,800	\$49,500
D	20	\$30,000	\$18,000	\$48,000	\$96,000	\$50,000
E	20	\$28,500	\$15,000	\$10,000	\$53,500	\$50,000
F	16	\$20,000	\$6,000	\$20,000	\$46,000	\$20,000
G	1	\$7,500	\$10,000	\$10,000	\$27,500	\$15,000
H	55	\$95,000	\$108,000	\$115,000	\$318,000	\$100,000
I	2	\$23,000	\$12,000	\$9,000	\$44,000	\$9,000
J	2	\$12,000	\$12,000	\$12,000	\$36,000	\$21,000
K	8	\$45,000	\$52,500	\$45,500	\$143,000	\$40,250
L	5	\$33,000	\$28,000	\$28,000	\$89,000	\$25,000
M	11	\$27,680	\$51,560	\$51,560	\$130,800	\$48,320
Minimum	1				\$27,500	\$3,000
Maximum	55				\$318,000	\$100,000
Average	14				\$92,046	\$37,159

## 2.5.4 Harmonization with international standards

As previously identified, an effective implementation must be harmonized with international standards; therefore, if an SMS rule is to be passed, compliance with the ICAO Framework makes the most sense.

**Attachment A– Gap Analysis  
FAA Order VS 8000.367 Appendix B to 14 CFR**

# Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR

Order 8000.367 Appendix B Preamble	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
	<p>The following requirements are the minimum set of requirements that must be established for constituent product/service provider organizations for which AVS services have oversight responsibility.</p>	<p>The following references defined below represent the best applicable regulations, Orders, Advisory Circulars (ACs), etc. that satisfy/fulfill or that most closely match the intent of the corresponding SMS requirement with respect to the "safety" of the product. The supporting assessment ratings, exceptions, and associated comments provide further clarification, as needed. The following comparison focuses on continuing airworthiness (read maintenance) of aircraft and/or aircraft components (reference CFRs Parts 43, 121, 135, 145, etc.).</p> <p>There is a general perception that the Federal Aviation Regulations (FARs), 14CFR, far exceed numerous "safety" principles/elements required by an SMS. Various gaps (full or partial) were identified for specific SMS requirements associated to the four sections/pillars (i.e., Safety Policy, Safety Risk Management, Safety Assurance, Safety Promotion). The FARs require that the article being maintained, repaired, and/or overhauled be "airworthy"; an "airworthy" item is assumed to be safe.</p> <p>NOTE: In many instances, the required infrastructure exists, but there is not currently a requirement to satisfy the specific aviation safety requirement/expectation defined in FAA Order 8000.367 Appendix B.</p>			
1	<p><b>Scope and Applicability.</b> To be developed by the AVS service/office.</p>	<p>§21.1 Applicability</p> <p>(a) This part prescribes— (1) Procedural requirements for the issue of type certificates and changes to those certificates; the issue of production certificates; the issue of airworthiness certificates; and the issue of export airworthiness approvals. (2) Rules governing the holders of any certificate specified in paragraph (a)(1) of this section; and (3) Procedural requirements for the approval of certain materials, parts, processes, and appliances.</p> <p>§145.1 Applicability</p> <p>This part describes how to obtain a repair station certificate. This part also contains the rules a certificated repair station must follow related to its performance of maintenance, preventive maintenance, or alterations of an aircraft, airframe, aircraft engine, propeller, appliance, or component part to which part 43 applies. It also applies to any person who holds, or is required to hold, a repair station certificate issued under this part.</p> <p>§43.1 Applicability</p> <p>(a) Except as provided in paragraphs (b) and (d) of this section, this part prescribes rules governing the maintenance, preventive maintenance, rebuilding, and alteration of any— (1) Aircraft having a U.S. airworthiness certificate; (2) Foreign-registered civil aircraft used in common carriage or carriage of mail under the provisions of Part 121 or 135 of this chapter; and (3) Airframe, aircraft engines, propellers, appliances, and component parts of such aircraft.</p> <p>§25.1 Applicability</p> <p>(a) This part prescribes airworthiness standards for the issue of type certificates, and changes to those certificates, for transport category airplanes. (b) Each person who applies under Part 21 for such a certificate or change must show compliance with the applicable requirements in this part.</p> <p>§33.1 Applicability</p> <p>(a) This part prescribes airworthiness standards for the issue of type certificates and changes to those certificates, for aircraft engines. (b) Each person who applies under part 21 for such a certificate or change must show compliance with the applicable requirements of this part and the applicable requirements of part 34 of this chapter.</p>		N/A	N/A
2	<p><b>References.</b> To be developed by the AVS service/office.</p>	<p>Title 49 USC, 14 CFR, FAA Orders, Advisory Circulars</p>		N/A	N/A
3	<p><b>Definitions.</b> To be developed by the AVS service, but the definitions should be consistent with existing FAA definitions and those in the AVSSMS.</p> <p>(Appendix A: Definitions) <b>Safety:</b> The state in which the risk of harm to persons or property damage is reduced to, and maintained at or below, an acceptable level through a continuing process of hazard identification and risk management. <b>Hazard:</b> Any existing or potential condition that can lead to injury, illness or death to people; damage to or loss of a system, equipment, or property; or damage to</p>	<p>14CFR § 91.7 Civil aircraft airworthiness</p> <p>Title 49 United States Code</p> <p>FAA Order 8130.2F Airworthiness Certification of Aircraft and Related Products</p>	<p>a. No person may operate a civil aircraft unless it is in airworthy condition;</p> <p>§ 44704(d) The Administrator shall issue an airworthiness certificate when the Administrator finds that the aircraft conforms to its type certificate and, after inspection, is in condition for safe operation.</p> <p>19. the two conditions necessary for issuance of an airworthiness certificate: a. The aircraft must conform to its Type Certificate. Conformity to type design is considered attained when the aircraft configuration and the components installed are consistent with the drawings, specifications, and other data that are part of the Type Certificate, which includes any supplemental type certificate (STC) and field approved alterations incorporated into the aircraft. b. The aircraft must be in a condition for safe operation.</p>	N/A	N/A

### Assessment Rating

- 0 = The element is not performed.
- 1 = The element is in place; however, it does not include all SMS processes.
- 2 = The element is in place and includes all SMS processes.

# Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR

Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
	<p>the environment. A hazard is a condition that is a prerequisite to an accident or incident. Risk/Safety Risk: The composite of predicted severity and likelihood of the potential effect of a hazard.</p>	<p>§21.41 Type certificate</p>	<p>Each type certificate is considered to include the type design, the operating limitations, the certificate data sheet, the applicable regulations of this subchapter with which the Administrator records compliance, and any other conditions or limitations prescribed for the product in this subchapter.</p> <p>§21.31 Type design: The type design consists of—</p> <p>(a) The drawings and specifications, and a listing of those drawings and specifications, necessary to define the configuration and the design features of the product shown to comply with the requirements of that part of this subchapter applicable to the product;</p> <p>(b) Information on dimensions, materials, and processes necessary to define the structural strength of the product;</p> <p>(c) The Airworthiness Limitations section of the Instructions for Continued Airworthiness as required by parts 23, 25, 26, 27, 29, 31, 33, and 35 of this subchapter, or as otherwise required by the Administrator.</p> <p>§21.50 Instructions for Continued Airworthiness: b) The holder of a design approval, including either the type certificate or supplemental type certificate for an aircraft, aircraft engine, or propeller shall furnish at least one set of complete Instructions for Continued Airworthiness, to the owner of each type aircraft, aircraft engine, or propeller... The Instructions must be prepared in accordance with §§23.1529, 25.1529, 25.1729, 27.1529, 29.1529, 31.82, 33.4, 35.4, or part 26 of this subchapter.</p> <p>Part 25 Subpart G - Operating Limitations and Information. §25.1529 The applicant must prepare Instructions for Continued Airworthiness in accordance with appendix H to this part that are acceptable to the Administrator.</p> <p>§33.4 Instructions for Continued Airworthiness The applicant must prepare Instructions for Continued Airworthiness in accordance with Appendix A to this part that are acceptable to the Administrator.</p>		
		<p>§33.75 Safety analysis</p>	<p>(1) The applicant must analyze the engine, including the control system, to assess the likely consequences of all failures that can reasonably be expected to occur. This analysis will take into account, if applicable:</p> <p>(i) Aircraft-level devices and procedures assumed to be associated with a typical installation. Such assumptions must be stated in the analysis.</p> <p>(ii) Consequential secondary failures and latent failures.</p> <p>(3) The applicant must show that hazardous engine effects are predicted to occur at a rate not in excess of that defined as extremely remote (probability range of <math>10e(-7)</math> to <math>10e(-9)</math> [1 per 10,000,000 engine flight hours to 1 per 1,000,000,000 flight hours]). Since the estimated probability for individual failures may be insufficiently precise to enable the applicant to assess the total rate for hazardous engine effects, compliance may be shown by demonstrating that the probability of a hazardous engine effect arising from an individual failure can be predicted to be not greater than <math>10e(-8)</math> [1 per 100,000,000] engine flight hours.</p>		
		<p>§25.1309 Equipment, systems, and installations</p>	<p>(a) The equipment, systems, and installations whose functioning is required by this subchapter, must be designed to ensure that they perform their intended functions under any foreseeable operating condition.</p> <p>(b) The airplane systems and associated components, considered separately and in relation to other systems, must be designed so that—</p> <p>(1) The occurrence of any failure condition which would prevent the continued safe flight and landing of the airplane is extremely improbable, and</p> <p>(2) The occurrence of any other failure conditions which would reduce the capability of the airplane or the ability of the crew to cope with adverse operating conditions is improbable.</p>		

### Assessment Rating

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## Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR

Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
4		AC 25.1309-1A System Design and Analysis	10. Quantitative Assessment. B. Quantitative Probability Terms. When using quantitative analyses to help determine compliance with § 25.1309(b), the following descriptions of the probability terms used in this regulation and this AC have become commonly-accepted as aids to engineering judgment. They are usually expressed in terms of acceptable numerical probability ranges for each flight-hour, based on a flight of mean duration for the airplane type. (1) Probable failure conditions are those having a probability greater than on the order of 1 X 10e(-5), [greater than 1 per 100,000 flight-hours]. (2) Improbable failure conditions are those having a probability on the order of 1 X 10e(-5) or less, but greater than on the order of 1 X 10e(-9) [less than 1 per 100,000 flight-hours, but greater than 1 per 1,000,000,000 flight-hours]. (3) Extremely improbable failure conditions are those having a probability on the order of 1 X 10e(-9) or less [less than 1 per 1,000,000,000 flight-hours].		
4.a.	<b>Policy.</b> [ref. Chapter 2 of the Order]			1	
4.a.(1)	<b>General Requirements.</b> Safety management must be included in the entire life cycle of the organization's outputs.	Title 14 Code of Federal Regulations (14CFR)	Every aspect of civil aviation requires that all products, from design and production and throughout operational life (flight and maintenance), be airworthy, including operating the product in accordance with regulatory defined airworthiness requirements.	1	Maintainers need to submit information to operators so that they may evaluate the information as a potential hazard. The operator would then evaluate the report as if it was reported internally. Similar to an Service Difficulty Report (SDR).  The SDR system must also feedback to the Part 21 manufacturer and their risk management system.
4.a.(2)	The organization must promote the growth of a positive safety culture (described in Chapter 4, Section b and Chapter 7, Section a).	Part 145, Part 43, and relative ACs	No specific section requires promotion.	1	Quality control systems react; but there is no proactive requirement.  The training program required by 145.163 promotes safety as defined in AC 145-10, para. 301.  Needs to be added as a policy; but, not as a stand alone manual requirement. It may be included in the Repair Station Manual (RSM).
4.b.	<b>Safety Policy.</b>			0	There is no requirement for a specific safety policy.
4.b.(1)	Top management is responsible for the organization's safety policy and its safety performance.	§145.3 Definition of terms	(a) Accountable manager means the person designated by the certificated repair station who is responsible for and has the authority over all repair station operations that are conducted under part 145, including ensuring that repair station personnel follow the regulations and serving as the primary contact with the FAA. (e) Designate a repair station employee as the accountable manager;	0	Safety is a result of a QMS.
4.b.(2)	The safety policy must:	§145.151 Personnel requirements			
4.b.(2)(a)	include commitment to implement and maintain the SMS;	§145.211 Quality control system	(a) A certificated repair station must establish and maintain a quality control system acceptable to the FAA that ensures the airworthiness of the articles on which the repair station or any of its contractors performs maintenance, preventive maintenance, or alterations. (b) Repair station personnel must follow the quality control system when performing maintenance, preventive maintenance, or alterations under the repair station certificate and operations specifications.	0	A Part 145 QMS includes a system that ensure quality assurance in manner similar to an SMS. The desired outcome is present.
4.b.(2)(b)	include commitment to continual improvement in the level of safety;	§145.211 Quality control system	(a) A certificated repair station must establish and maintain a quality control system acceptable to the FAA that ensures the airworthiness of the articles on which the repair station or any of its contractors performs maintenance, preventive maintenance, or alterations. (c) A certificated repair station must prepare and keep current a quality control manual in a format acceptable to the FAA that includes the following: (1) A description of the system and procedures used for— (ix) Taking corrective action on deficiencies;	0	A Part 145 QMS includes a system that ensure quality assurance in manner similar to an SMS. The desired outcome is present.

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## Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR

Order 8000.367 Appendix B 4.b.(2)(c)	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
	include a commitment to the management of safety risk;			0	A change in the organization requires an analysis of the hazard (in this case human factors) of the impact on the organization's safety. You need to define the planning. Will the repair be done the right way.
		Order 8000.367 - Appendix A	<u>Safety risk</u> - The composite of predicted severity and likelihood of the potential effect of a hazard.		
		\$33.75 Safety Analysis;	33.75(a)(1) The applicant (for engine TC) must analyze the engine, including the control system, to assess the likely consequences of all failures that can reasonably be expected to occur. (3) The applicant must show that hazardous engine effects are predicted to occur at a rate not in excess of that defined as extremely remote (probability range of 10e(-7) to 10e(-9) per engine flight hour). (4) The applicant must show that major engine effects are predicted to occur at a rate not in excess of that defined as remote (probability range of 10e(-5) to 10e(-7) per engine flight hour).		
		\$25.571 Damage-tolerance and fatigue evaluation of structure	(a) An evaluation of the strength, detail design, and fabrication must show that catastrophic failure due to fatigue, corrosion, manufacturing defects, or accidental damage, will be avoided throughout the operational life of the airplane.		
		\$25.1309 Equipment, systems, and installations	(b) The airplane systems and associated components, considered separately and in relation to other systems, must be designed so that— (1) The occurrence of any failure condition which would prevent the continued safe flight and landing of the airplane is extremely improbable, and (2) The occurrence of any other failure conditions which would reduce the capability of the airplane or the ability of the crew to cope with adverse operating conditions is improbable.		
		\$43.13 Performance rules (general)	(a) Each person performing maintenance, alteration, or preventive maintenance on an aircraft, engine, propeller, or appliance shall use the methods, techniques, and practices prescribed in the current manufacturer's maintenance manual or instructions for Continued Airworthiness prepared by its manufacturer, or other methods, techniques, and practices acceptable to the Administrator.		
		\$145.109 Equipment, tools, and data requirements	(a) Except as otherwise prescribed by the FAA, a certificated repair station must have the equipment, tools, and materials necessary to perform the maintenance, preventive maintenance, or alterations under its repair station certificate and operations specifications in accordance with part 43. The equipment, tools, and material must be located on the premises and under the repair station's control when the work is being done.		
		\$145.155 Inspection personnel requirements	(a) A certificated repair station must ensure that persons performing inspections under the repair station certificate and operations specifications are— (1) Thoroughly familiar with the applicable regulations in this chapter and with the inspection methods, techniques, practices, aids, equipment, and tools used to determine the airworthiness of the article on which maintenance, preventive maintenance, or alterations are being performed; and (2) Proficient in using the various types of inspection equipment and visual inspection aids appropriate for the article being inspected;		
		\$145.211 Quality control system	(a) A certificated repair station must establish and maintain a quality control system acceptable to the FAA that ensures the airworthiness of the articles on which the repair station or any of its contractors performs maintenance, preventive maintenance, or alterations.		
		\$145.213 Inspection of maintenance, preventive maintenance, or alterations	(a) A certificated repair station must inspect each article upon which it has performed maintenance, preventive maintenance, or alterations as described in paragraphs (b) and (c) of this section before approving that article for return to service. (b) A certificated repair station must certify on an article's maintenance release that the article is airworthy with respect to the maintenance, preventive maintenance, or alterations performed after— (1) The repair station performs work on the article; and (2) An inspector inspects the article on which the repair station has performed work and determines it to be airworthy with respect to the work performed.		
		\$145.217 Contract maintenance	(b) A certificated repair station may contract a maintenance function pertaining to an article to a noncertificated person provided— (3) The certificated repair station verifies, by test and/or inspection, that the work has been performed satisfactorily by the noncertificated person and that the article is airworthy before approving it for return to service.		

### Assessment Rating

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1 = The element is in place; however, it does not include all SMS processes.

2 = The element is in place and includes all SMS processes.

## Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR

Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
4.b.(2)(d)	include commitment to comply with applicable legal, regulatory and statutory requirements;	14CFR Part 43 Maintenance, Preventive Maintenance, Rebuilding, and Alteration, §145.201 Privileges and limitations of certificate §145.211 Quality control system	43.13(b) Each person maintaining or altering, or performing preventive maintenance, shall do that work in such a manner and use materials of such a quality, that the condition of the aircraft, airframe, aircraft engine, propeller, or appliance worked on will be at least equal to its original or properly altered condition (with regard to aerodynamic function, structural strength, resistance to vibration and deterioration, and other qualities affecting airworthiness).  (a) A certificated repair station may— (3) Approve for return to service any article for which it is rated after it has performed maintenance, preventive maintenance, or an alteration in accordance with part 43.  (a) A certificated repair station must establish and maintain a quality control system acceptable to the FAA that ensures the airworthiness of the articles on which the repair station or any of its contractors performs maintenance, preventive maintenance, or alterations. (b) Repair station personnel must follow the quality control system when performing maintenance, preventive maintenance, or alterations under the repair station certificate and operations specifications.	2	While there is no policy we have a requirement to comply with the regulation.
4.b.(2)(e)	include an expectation that employees will report safety issues and, where possible, provide proposals for solutions/safety improvements;	§145.221 Service Difficulty Reports	(a) A certificated repair station must report to the FAA within 96 hours after it discovers any serious failure, malfunction, or defect of an article. The report must be in a format acceptable to the FAA. (b) report must contain... (7) Other pertinent information that is necessary for more complete identification, determination of seriousness, or corrective action.	1	This does not include items that may be a safety hazard; but, needs to be captured and reported to the operator. Different than an Service Difficulty Report (SDR).
4.b.(2)(f)	establish clear standards for acceptable behavior;	Part 145	(b) Each person maintaining or altering, or performing preventive maintenance, shall do that work in such a manner and use materials of such a quality, that the condition of the aircraft, airframe, aircraft engine, propeller, or appliance worked on will be at least equal to its original or properly altered condition (with regard to aerodynamic function, structural strength, resistance to vibration and deterioration, and other qualities affecting airworthiness).  (b) The training program must ensure each employee assigned to perform maintenance, preventive maintenance, or alterations, and inspection functions is capable of performing the assigned task.	0	No over arching requirement to report safety risks or identify hazards.  Change is required. Expansion and clarification. No clear standards.  The training program required by 145.163 establishes safety as defined in AC 145-10, para. 301.
4.b.(2)(g)	provide management guidance for setting safety objectives;	§145.201 Privileges and limitations of certificate	(a) A certificated repair may- (3) Approve for return to service any article for which it is rated after it has performed maintenance, preventive maintenance, or an alteration in accordance with part 43. [see §43.13(b), above (i.e., everything must be airworthy.)]	1	There is no specified requirement for safety objectives.
4.b.(2)(h)	provide management guidance for reviewing safety objectives;	§145.211 Quality control system	(a) A certificated repair station must establish and maintain a quality control system acceptable to the FAA that ensures the airworthiness of the articles on which the repair station or any of its contractors performs maintenance, preventive maintenance, or alterations.  (a) Each certificate holder shall establish and maintain a system for the continuing analysis and surveillance of the performance and effectiveness of its inspection program and the program covering other maintenance, preventive maintenance, and alterations and for the correction of any deficiency in those programs, regardless of whether those programs are carried out by the certificate holder or by another person.  (a) Each certificate holder shall establish and maintain a system for the continuing analysis and surveillance of the performance and effectiveness of its inspection program and the program covering other maintenance, preventive maintenance, and alterations and for the correction of any deficiency in those programs, regardless of whether those programs are carried out by the certificate holder or by another person.	1	145.211 provides the elements of the system; however, there is no requirement to ever review the system once it is complete.  Air Carriers require review of the maintenance program  Not required in Part 145. It is required for EASA. Safety Objective may be N/A because Part 145 objectives are zero tolerance.
4.b.(2)(i)	be communicated to all employees and responsible parties;	§145.207 Repair station manual §145.211 Quality control system §145.163 Training requirements	(c) A certificated repair station's current repair station manual must be accessible for use by repair station personnel required by subpart D of this part. (b) Repair station personnel must follow the quality control system when performing maintenance, preventive maintenance, or alterations under the repair station certificate and operations specifications. (b) The training program must ensure each employee assigned to perform maintenance, preventive maintenance, or alterations, and inspection functions is capable of performing the assigned task.	2	Training is one mechanism used to communicate repair station standards.

### Assessment Rating

0 = The element is not performed.

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## Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR

Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
4.b.(2)(j)	be reviewed periodically to ensure it remains relevant and appropriate to the organization; and	§121.375 Maintenance and preventive maintenance training program	Each certificate holder or person performing maintenance or preventive maintenance functions for it shall have a training program to ensure that each person (including inspection personnel) who determines the adequacy of work done is fully informed about procedures and techniques and new equipment in use and is competent to perform his duties.	1	145.211 provides the elements of the system; however, there is no requirement to ever review the system once it is complete.  Air Carriers require review of the maintenance program  Not required in Part 145. It is required for EASA. Safety Objective may be N/A because Part 145 objectives are zero tolerance.
		§135.433 Maintenance and preventive maintenance training program	Each certificate holder or a person performing maintenance or preventive maintenance functions for it shall have a training program to ensure that each person (including inspection personnel) who determines the adequacy of work done is fully informed about procedures and techniques and new equipment in use and is competent to perform that person's duties.		
4.b.(2)(k)	identify responsibility and accountability of management and employees with respect to safety performance.	§145.211 Quality control system	(c) A certificated repair station must prepare and keep current a quality control manual in a format acceptable to the FAA that includes the following: (1) A description of the system and procedures used for- (ix) Taking corrective action on deficiencies; (4) Procedures for revising the quality control manual required under this section and notifying the certificate holding district office of the revisions, including how often the certificate holding district office will be notified of revisions.	2	Within the requirements of safety performance as previously identified.
		§135.431 Continuing analysis and surveillance.	(a) Each certificate holder shall establish and maintain a system for the continuing analysis and surveillance of the performance and effectiveness of its inspection program and the program covering other maintenance, preventive maintenance, and alterations and for the correction of any deficiency in those programs, regardless of whether those programs are carried out by the certificate holder or by another person.		
4.c.	Quality Policy. Top management must ensure that the organization's quality policy is consistent with the SMS.	§121.373 Continuing analysis and surveillance.	(a) Each certificate holder shall establish and maintain a system for the continuing analysis and surveillance of the performance and effectiveness of its inspection program and the program covering other maintenance, preventive maintenance, and alterations and for the correction of any deficiency in those programs, regardless of whether those programs are carried out by the certificate holder or by another person.	0	While there is a quality control system, there is no requirement for a quality policy statement. ISO compliant organizations are required to have a policy statement.
		§145.151 Personnel requirements	Each certificated repair station must— (a) Designate a repair station employee as the accountable manager; (b) Provide qualified personnel to plan, supervise, perform, and approve for return to service the maintenance, preventive maintenance, or alterations performed under the repair station certificate and operations specifications; (c) Ensure it has a sufficient number of employees with the training or knowledge and experience in the performance of maintenance, preventive maintenance, or alterations authorized by the repair station certificate and operations specifications to ensure all work is performed in accordance with part 43; and (d) Determine the abilities of its noncertificated employees performing maintenance functions based on training, knowledge, experience, or practical tests.		
4.d.	Safety Planning. The organization must establish and maintain a safety management plan to meet the safety objectives described in its safety policy.  FN1 - Safety planning is a component of safety management that is focused on setting safety objectives and specifying necessary operational processes and related resource requirements to fulfill those objectives.	§145.211(a)	(a) A certificated repair station must establish and maintain a quality control system acceptable to the FAA that ensures the airworthiness of the articles on which the repair station or any of its contractors performs maintenance, preventive maintenance, or alterations.	1	Part 145 in its self is not a safety policy; however, compliance with Part 145 is mandatory. This results in airworthy articles and is directly related to safety.
		§145.3 Definition of terms	(a) Accountable manager means the person designated by the certificated repair station who is responsible for and has the authority over all repair station operations that are conducted under part 145, including ensuring that repair station personnel follow the regulations and serving as the primary contact with the FAA.		
4.e.	Organization Structure and Responsibilities. Top management must have the ultimate responsibility for the SMS.			1	There is responsible person. Safety is not currently part of the defined role.

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**Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR**

Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
4.e.(2)	Top management must provide resources essential to implement and maintain the SMS.	<p>§145.201 Privileges and limitations of certificate</p> <p>§145.151 Personnel requirements</p>	<p>(a) A certificated repair station may—</p> <p>(3) Approve for return to service any article for which it is rated after it has performed maintenance, preventive maintenance, or an alteration in accordance with part 43.</p> <p>Each certificate repair station must—</p> <p>(a) Designate a repair station employee as the accountable manager;</p> <p>Each certificate repair station must—</p> <p>(b) Provide qualified personnel to plan, supervise, perform, and approve for return to service the maintenance, preventive maintenance, or alterations performed under the repair station certificate and operations specifications;</p> <p>(c) Ensure it has a sufficient number of employees with the training or knowledge and experience in the performance of maintenance, preventive maintenance, or alterations authorized by the repair station certificate and operations specifications to ensure all work is performed in accordance with part 43;</p>	1	The resources and personnel are provided; however, they are not specifically tasked to maintain safety except that safety is a result of airworthiness.
		<p>§145.103 Housing and facilities requirements</p>	<p>(a) Each certificated repair station must provide—</p> <p>(1) Housing for the facilities, equipment, materials, and personnel consistent with its ratings.</p> <p>(2) Facilities for properly performing the maintenance, preventive maintenance, or alterations of articles or the specialized services for which it is rated. Facilities must include the following:</p> <p>(i) Sufficient work space and areas for the proper segregation and protection of articles during all maintenance, preventive maintenance, or alterations;</p> <p>(ii) Segregated work areas enabling environmentally hazardous or sensitive operations such as painting, cleaning, welding, avionics work, electronic work, and machining to be done properly and in a manner that does not adversely affect other maintenance or alteration articles or activities;</p> <p>(iii) Suitable racks, hoists, trays, stands, and other segregation means for the storage and protection of all articles undergoing maintenance, preventive maintenance, or alterations;</p> <p>(iv) Space sufficient to segregate articles and materials stocked for installation from those articles undergoing maintenance, preventive maintenance, or alterations; and</p> <p>(v) Ventilation, lighting, and control of temperature, humidity, and other climatic conditions sufficient to ensure personnel perform maintenance, preventive maintenance, or alterations to the standards required by this part.</p> <p>(b) A certificated repair station with an airframe rating must provide suitable permanent housing to enclose the largest type and model of aircraft listed on its operations specifications.</p> <p>(c) A certificated repair station may perform maintenance, preventive maintenance, or alterations on articles outside of its housing if it provides suitable facilities that are acceptable to the FAA and meet the requirements of §145.103(a) so that the work can be done in accordance with the requirements of part 43 of this chapter.</p>		
4.e.(3)	Top management must designate a management official to implement and maintain the SMS.	<p>§145.109 Equipment, materials, and data requirements</p>	<p>(a) Except as otherwise prescribed by the FAA, a certificated repair station must have the equipment, tools, and materials necessary to perform the maintenance, preventive maintenance, or alterations under its repair station certificate and operations specifications in accordance with part 43. The equipment, tools, and material must be located on the premises and under the repair station's control when the work is being done.</p>	1	The infrastructure is provided; the specific safety requirement is not.  In smaller repair stations the accountable manager will most likely be assigned this responsibility. In larger facilities a separate management official would be required.
		<p>§145.3 Definition of terms</p> <p>§145.151 Personnel requirements</p> <p>§145.153 Supervisory personnel requirements</p>	<p>(a) Accountable manager means the person designated by the certificated repair station who is responsible for and has the authority over all repair station operations that are conducted under part 145, including ensuring that repair station personnel follow the regulations and serving as the primary contact with the FAA.</p> <p>Each certificate repair station must—</p> <p>(a) Designate a repair station employee as the accountable manager;</p> <p>(a) A certificated repair station must ensure it has a sufficient number of supervisors to direct the work performed under the repair station certificate and operations specifications. The supervisors must oversee the work performed by any individuals who are unfamiliar with the methods, techniques, practices, aids, equipment, and tools used to perform the maintenance, preventive maintenance, or alterations.</p>		

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Order 8000.367 Appendix B 4.e.(4)	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
4.e.(4)	Responsibilities for aviation safety positions, duties and authorizations must be defined;	§145.3 Definitions	(a) Accountable manager means the person designated by the certificated repair station who is responsible for and has the authority over all repair station operations that are conducted under part 145, including ensuring that repair station personnel follow the regulations and serving as the primary contact with the FAA. (b) Each supervisor must— (1) If employed by a repair station located inside the United States, be certificated under part 65. (2) If employed by a repair station located outside the United States— (i) Be trained in or thoroughly familiar with the methods, techniques, practices, aids, equipment, and tools used to perform the maintenance, preventive maintenance, or alterations.	1	NOTE: The term <u>Aviation Safety Position</u> is not defined in Order VS 8000.367, nor in any of the FAA literature. The term is also not defined in the ICAO Safety Management Manual, Doc. 9859. The assumption made in cross referencing Order VS 8000.367 to the FARs and related was that anyone performing maintenance, and any management position with influence over anyone performing maintenance, would be considered an Aviation Safety Position.
4.e.(4)(a)	§145.153 Supervisory personnel requirements	§145.155 Inspection personnel requirements	(a) A certificated repair station must ensure that persons performing inspections under the repair station certificate and operations specifications are— (1) Thoroughly familiar with the applicable regulations in this chapter and with the inspection methods, techniques, practices, aids, equipment, and tools used to determine the airworthiness of the article on which maintenance, preventive maintenance, or alterations are being performed;	1	The infrastructure in provided; the specific aviation safety requirement is not.
4.e.(4)(b)	§145.157 Personnel authorized to approve an article for return to service	§145.209 Repair station manual contents	(a) A certificated repair station located inside the United States must ensure each person authorized to approve an article for return to service under the repair station certificate and operations specifications is certificated under part 65. (b) A certificated repair station located outside the United States must ensure each person authorized to approve an article for return to service under the repair station certificate and operations specifications is— (1) Trained in or has 18 months practical experience with the methods, techniques, practices, aids, equipment, and tools used to perform the maintenance, preventive maintenance, or alterations; and (2) Thoroughly familiar with the applicable regulations in this chapter and proficient in the use of the various inspection methods, techniques, practices, aids, equipment, and tools appropriate for the work being performed and approved for return to service. (c) A certificated repair station must ensure each person authorized to approve an article for return to service understands, reads, and writes English.	1	The infrastructure in provided; the specific aviation safety requirement is not.

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Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
		§145.211 Quality control system	<p style="text-align: center;"><b>SUBJECT - TITLE</b></p> <p>(a) A certificated repair station must establish and maintain a quality control system acceptable to the FAA that ensures the airworthiness of the articles on which the repair station or any of its contractors performs maintenance, preventive maintenance, or alterations.</p> <p>(b) Repair station personnel must follow the quality control system when performing maintenance, preventive maintenance, or alterations under the repair station certificate and operations specifications.</p> <p>(c) A certificated repair station must prepare and keep current a quality control manual in a format acceptable to the FAA that includes the following:</p> <ul style="list-style-type: none"> <li>(1) A description of the system and procedures used for— <ul style="list-style-type: none"> <li>(i) Inspecting incoming raw materials to ensure acceptable quality;</li> <li>(ii) Performing preliminary inspection of all articles that are maintained;</li> <li>(iii) Inspecting all articles that have been involved in an accident for hidden damage before maintenance, preventive maintenance, or alteration is performed;</li> <li>(iv) Establishing and maintaining proficiency of inspection personnel;</li> <li>(v) Establishing and maintaining current technical data for maintaining articles;</li> <li>(vi) Qualifying and surveilling noncertificated persons who perform maintenance, prevention maintenance, or alterations for the repair station;</li> <li>(vii) Performing final inspection and return to service of maintained articles;</li> <li>(viii) Calibrating measuring and test equipment used in maintaining articles, including the intervals at which the equipment will be calibrated; and</li> <li>(ix) Taking corrective action on deficiencies.</li> </ul> </li> </ul>		
4.e.(4)(c)	communicated throughout the organization.	§145.213 Inspection of maintenance, preventive maintenance, or alterations	<p>(a) A certificated repair station must inspect each article upon which it has performed maintenance, preventive maintenance, or alterations as described in paragraphs (b) and (c) of this section before approving that article for return to service.</p> <p>(b) A certificated repair station must certify on an article's maintenance release that the article is airworthy with respect to the maintenance, preventive maintenance, or alterations performed after—</p> <ul style="list-style-type: none"> <li>(1) The repair station performs work on the article; and</li> <li>(2) An inspector inspects the article on which the repair station has performed work and determines it to be airworthy with respect to the work performed.</li> </ul> <p>(c) For the purposes of paragraphs (a) and (b) of this section, an inspector must meet the requirements of §145.155.</p> <p>(d) Except for individuals employed by a repair station located outside the United States, only an employee certificated under part 65 is authorized to sign off on final inspections and maintenance releases for the repair station.</p>	1	Training is one mechanism used to communicate repair station standards.
4.f.	<b>Compliance with Legal and Other Requirements.</b>	§145.207 Repair station manual §145.163 Training requirements	<p>(c) A certificated repair station's current repair station manual must be accessible for use by repair station personnel required by subpart D of this part.</p> <p>(b) The training program must ensure each employee assigned to perform maintenance, preventive maintenance, or alterations, and inspection functions is capable of performing the assigned task.</p>	1	
4.f.(1)	The SMS must incorporate a means of compliance with FAA policy, legal, regulatory and statutory requirements applicable to the SMS.	14CFR Part 43 Maintenance, Preventive Maintenance, Rebuilding, and Alteration, §121.361 Applicability §135.411 Applicability	<p>(b) Each person maintaining or altering, or performing preventive maintenance, shall do that work in such a manner and use materials of such a quality, that the condition of the aircraft, airframe, aircraft engine, propeller, or appliance worked on will be at least equal to its original or properly altered condition (with regard to aerodynamic function, structural strength, resistance to vibration and deterioration, and other qualities affecting airworthiness).</p> <p>(a) Except as provided by paragraph (b) of this section, this subpart prescribes requirements for maintenance, preventive maintenance, and alterations for all certificate holders.</p> <p>(a) This subpart prescribes rules in addition to those in other parts of this chapter for the maintenance, preventive maintenance, and alterations for each certificate holder as follows: ...</p>	1	The infrastructure in provided; the specific aviation safety requirement is not.

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4.f.(2)	The organization must establish and maintain a procedure to identify the current FAA policy, legal, regulatory and statutory requirements applicable to the SMS.	<p>§ 145.1 Applicability</p> <p>§145.201 Privileges and limitations of certificate</p> <p>§145.109 Equipment, materials, and data requirements.</p>	<p>This part describes how to obtain a repair station certificate. This part also contains the rules a certificated repair station must follow related to its performance of maintenance, preventive maintenance, or alterations of an aircraft, airframe, aircraft engine, propeller, appliance, or component part to which part 43 applies. It also applies to any person who holds, or is required to hold, a repair station certificate issued under this part.</p> <p>(a) A certificated repair station may—</p> <p>(3) Approve for return to service any article for which it is rated after it has performed maintenance, preventive maintenance, or an alteration in accordance with part 43.</p> <p>(d) A certificated repair station must maintain, in a format acceptable to the FAA, the documents and data required for the performance of maintenance, preventive maintenance, or alterations under its repair station certificate and operations specifications in accordance with part 43. The following documents and data must be current and accessible when the relevant work is being done:</p> <ol style="list-style-type: none"> <li>(1) Airworthiness directives,</li> <li>(2) Instructions for continued airworthiness,</li> <li>(3) Maintenance manuals,</li> <li>(4) Overhaul manuals,</li> <li>(5) Standard practice manuals,</li> <li>(6) Service bulletins, and</li> <li>(7) Other applicable data acceptable to or approved by the FAA.</li> </ol>	1	The infrastructure in provided; the specific aviation safety requirement is not.
		<p>§ 145.209 Repair station manual contents</p>	<p>A certificated repair station's manual must include the following:</p> <ol style="list-style-type: none"> <li>(a) An organizational chart identifying— <ol style="list-style-type: none"> <li>(1) Each management position with authority to act on behalf of the repair station,</li> <li>(2) The area of responsibility assigned to each management position, and</li> <li>(3) The duties, responsibilities, and authority of each management position;</li> </ol> </li> <li>(b) Procedures for maintaining and revising the rosters required by §145.161;</li> <li>(c) A description of the certificated repair station's operations, including the housing, facilities, equipment, and materials as required by subpart C of this part;</li> <li>(d) Procedures for— <ol style="list-style-type: none"> <li>(1) Revising the capability list provided for in §145.215 and notifying the certificate holding district office of revisions to the list, including how often the certificate holding district office will be notified of revisions; and</li> <li>(2) The self-evaluation required under §145.215(c) for revising the capability list, including methods and frequency of such evaluations, and procedures for reporting the results to the appropriate manager for review and action;</li> </ol> </li> <li>(e) Procedures for revising the training program required by §145.163 and submitting revisions to the certificate holding district office for approval;</li> <li>(f) Procedures to govern work performed at another location in accordance with §145.203;</li> <li>(g) Procedures for maintenance, preventive maintenance, or alterations performed under §145.205;</li> <li>(h) Procedures for— <ol style="list-style-type: none"> <li>(1) Maintaining and revising the contract maintenance information required by §145.217(a)(2)(i), including submitting revisions to the certificate holding district office for approval; and</li> <li>(2) Maintaining and revising the contract maintenance information required by §145.217(a)(2)(ii) and notifying the certificate holding district office of revisions to this information, including how often the certificate holding district office will be notified of revisions;</li> </ol> </li> <li>(i) A description of the required records and the recordkeeping system used to obtain, store, and retrieve the required records;</li> <li>(j) Procedures for revising the repair station's manual and notifying its certificate holding district office of revisions to the manual, including how often the certificate holding district office will be notified of revisions; and</li> <li>(k) A description of the system used to identify and control sections of the repair station manual.</li> </ol>		
		<p>§ 145.211 Quality control system</p>	<p>(a) A certificated repair station must establish and maintain a quality control system acceptable to the FAA that ensures the airworthiness of the articles on which the repair station or any of its contractors performs maintenance, preventive maintenance, or alterations.</p>		

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		<p>\$121.369 Manual requirements</p>	<p><b>SUBJECT - TITLE</b></p> <p>a) The certificate holder shall put in its manual a chart or description of the certificate holder's organization required by §121.365 and a list of persons with whom it has arranged for the performance of any of its required inspections, other maintenance, preventive maintenance, or alterations, including a general description of that work.</p> <p>b) The certificate holder's manual must contain the programs required by §121.367 that must be followed in performing maintenance, preventive maintenance, and alterations of that certificate holder's airplanes, including airframes, aircraft engines, propellers, rotors, appliances, emergency equipment, and parts thereof, and must include at least the following: ...</p>		
		<p>\$135.427 Manual requirements</p>	<p>(a) Each certificate holder shall put in its manual the chart or description of the certificate holder's organization required by §135.423 and a list of persons with whom it has arranged for the performance of any of its required inspections, other maintenance, preventive maintenance, or alterations, including a general description of that work.</p> <p>(b) Each certificate holder shall put in its manual the programs required by §135.425 that must be followed in performing maintenance, preventive maintenance, and alterations of that certificate holder's aircraft, including airframes, aircraft engines, propellers, rotors, appliances, emergency equipment, and parts, and must include at least the following:</p> <p>(1) The method of performing routine and nonroutine maintenance (other than required inspections), preventive maintenance, and alterations.</p> <p>(2) A designation of the items of maintenance and alteration that must be inspected (required inspections) including at least those that could result in a failure, malfunction, or defect endangering the safe operation of the aircraft, if not performed properly or if improper parts or materials are used.</p> <p>(3) The method of performing required inspections and a designation by occupational title of personnel authorized to perform each required inspection.</p> <p>(4) Procedures for the reinspection of work performed under previous required inspection findings (buy-back procedures).</p> <p>(5) Procedures, standards, and limits necessary for required inspections and acceptance or rejection of the items required to be inspected and for periodic inspection and calibration of precision tools, measuring devices, and test equipment.</p> <p>(6) Procedures to ensure that all required inspections are performed.</p> <p>(7) Instructions to prevent any person who performs any item of work from performing any required inspection of that work.</p> <p>(8) Instructions and procedures to prevent any decision of an inspector regarding any required inspection from being countermanded by persons other than supervisory personnel of the inspection unit, or a person at the level of administrative control that has overall responsibility for the management of both the required inspection functions and the other maintenance, preventive maintenance, and alterations functions.</p> <p>(9) Procedures to ensure that required inspections, other maintenance, preventive maintenance, and alterations that are not completed as a result of work interruptions are properly completed before the aircraft is released to service.</p> <p>(c) Each certificate holder shall put in its manual a suitable system (which may include a coded system) that provides for the retention of the following information—</p> <p>(1) A description (or reference to data acceptable to the Administrator) of the work performed;</p> <p>(2) The name of the person performing the work if the work is performed by a person outside the organization of the certificate holder; and</p> <p>(3) The name or other positive identification of the individual approving the work.</p> <p>(d) For the purposes of this part, the certificate holder must prepare that part of its manual containing maintenance information and instructions, in whole or in part, in printed form or other form, acceptable to the Administrator, that is retrievable in the English language.</p>		
4.g.	Operational Procedures and Controls.			1	
4.g.(1)	The organization must establish procedures with measurable criteria to accomplish its safety policy and objectives as defined by the SMS.	<p>\$145.211 Quality control system</p>	<p>(a) A certificated repair station must establish and maintain a quality control system acceptable to the FAA that ensures the airworthiness of the articles on which the repair station or any of its contractors performs maintenance, preventive maintenance, or alterations.</p>	0	<p>Procedures are in place; however, there is no requirement for measurable criteria.</p> <p>The article is airworthy or not. An airworthy item is assumed to be safe.</p>

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	<p>The organization must establish and maintain process controls to ensure procedures are followed for operations and activities as defined by the SMS.</p>	<p>§ 121.363 Responsibility for airworthiness</p>	<p>(a) Each certificate holder is primarily responsible for—                      (1) The airworthiness of its aircraft, including airframes, aircraft engines, propellers, appliances, and parts thereof; and                      (2) The performance of the maintenance, preventive maintenance, and alteration of its aircraft, including airframes, aircraft engines, propellers, appliances, emergency equipment, and parts thereof, in accordance with its manual and the regulations of this chapter.                      (b) A certificate holder may make arrangements with another person for the</p>		
4.g.(2)		<p>§ 135.413 Responsibility for airworthiness.</p>	<p>(a) Each certificate holder who maintains its aircraft under § 135.411(a)(2) shall—                      (1) Perform the maintenance, preventive maintenance, and alteration of its aircraft, including airframe, aircraft engines, propellers, rotors, appliances, emergency equipment and parts, under its manual and this chapter; or                      (2) Make arrangements with another person for the performance of maintenance, preventive maintenance, or alteration. However, the certificate holder shall ensure that any maintenance, preventive maintenance, or alteration that is performed by another person is performed under the certificate holder's manual and this chapter.</p>	1	The infrastructure in provided; the specific aviation safety requirement is not.
		<p>§ 145.211 Quality control system</p>	<p>(a) A certificated repair station must establish and maintain a quality control system acceptable to the FAA that ensures the airworthiness of the articles on which the repair station or any of its contractors performs maintenance, preventive maintenance, or alterations.                      (b) Repair station personnel must follow the quality control system when performing maintenance, preventive maintenance, or alterations under the repair station certificate and operations specifications.</p>		
		<p>§ 145.213 Inspection of maintenance, preventive maintenance, or alterations</p>	<p>(a) A certificated repair station must inspect each article upon which it has performed maintenance, preventive maintenance, or alterations as described in paragraphs (b) and (c) of this section before approving that article for return to service.                      (b) A certificated repair station must certify on an article's maintenance release that the article is airworthy with respect to the maintenance, preventive maintenance, or alterations performed after—                      (1) The repair station performs work on the article; and                      (2) An inspector inspects the article on which the repair station has performed work and determines it to be airworthy with respect to the work performed.</p>		
		<p>§ 121.367 Maintenance, preventive maintenance, and alterations programs.</p>	<p>Each certificate holder shall have an inspection program and a program covering other maintenance, preventive maintenance, and alterations that ensures that—                      (a) Maintenance, preventive maintenance, and alterations performed by it, or by other persons, are performed in accordance with the certificate holder's manual;                      (b) Competent personnel and adequate facilities and equipment are provided for the proper performance of maintenance, preventive maintenance, and alterations; and                      (c) Each aircraft released to service is airworthy and has been properly maintained for operation under this part.</p>		
		<p>§ 135.425 Maintenance, preventive maintenance, and alteration programs.</p>	<p>Each certificate holder shall have an inspection program and a program covering other maintenance, preventive maintenance, and alterations that ensures that—                      (a) Maintenance, preventive maintenance, and alterations performed by it, or by other persons, are performed under the certificate holder's manual;                      (b) Competent personnel and adequate facilities and equipment are provided for the proper performance of maintenance, preventive maintenance, and alterations; and                      (c) Each aircraft released to service is airworthy and has been properly maintained for operation under this part.</p>		
4.h.	<p><b>Emergency Preparedness and Response.</b></p>			N/A	
4.h.(1)	<p>The organization must establish a plan for response to accidents and serious incidents.</p>	<p>In both federal law and in Order VS 8000.367, accidents and incidents pertain to aircraft flight operation only, not to maintenance, or administrative, operations.</p>		N/A	Under the existing regulations, this would not be applicable to maintenance.

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Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
		49 CFR §830.2 Definitions	<p>Aircraft accident means an occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage**. (NOTE: This is the verbatim definition of "Accident" in Appendix A: Definitions, Order VS 8000.367)</p> <p>Incident means an occurrence other than an accident, associated with the operation of an aircraft, which affects or could affect the safety of operations.</p> <p>(NOTE: This is similar to the definition of "Incident" in Appendix A: Definitions, Order 8000.367: Incident – An occurrence other than an accident that affects or could affect the safety of operations.)</p> <p>*Serious injury means any injury which:                      (1) Requires hospitalization for more than 48 hours, commencing within 7 days from the date of the injury was received;                      (2) results in a fracture of any bone (except simple fractures of fingers, toes, or nose);                      (3) causes severe hemorrhages, nerve, muscle, or tendon damage;                      (4) involves any internal organ; or                      (5) involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.</p> <p>**Substantial damage means damage or failure which adversely affects the structural strength, performance, or flight characteristics of the aircraft, and which would normally require major repair or replacement of the affected component. Engine failure or damage limited to an engine if only one engine fails or is damaged, bent fairings or cowling, dented skin, small punctured holes in the skin or fabric, ground damage to rotor or propeller blades, and damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wingtips are not considered "substantial damage" for the purpose of this part.</p>		<p>The definition of incident in Order 8000.367 is in conflict with existing regulation.                      Eliminating the double underlined text from 49 CFR §830.2 expands the scope significantly.                      Clarification must be provided. Regardless, the regulations must be consistent.</p> <p>According to Don Arendt, "The definition of the Order, should be the same as the regulation. This error may have been induced by the editors in the plain language department."</p> <p>Clarify for maintenance is this limited to support of an investigation?</p>
4.h.(2)	The effectiveness of the plan must be verified at intervals, either by response to real events or as an exercise.	49 CFR Part 830 Notification and Reporting of Aircraft Accidents or Incidents and Overdue Aircraft, and Preservation of Aircraft Wreckage, Mail, Cargo, and Records	<p>§ 830.5 Immediate notification.                      The operator of any civil aircraft, or any public aircraft not operated by the Armed Forces or an intelligence agency of the United States, or any foreign aircraft shall immediately, and by the most expeditious means available, notify the nearest National Transportation Safety Board (Board) field office when:                      (a) An aircraft accident or any of the following listed incidents occur: (1) through (7) in the reg.]                      (b) An aircraft is overdue and is believed to have been involved in an accident.</p>	N/A	This may not apply [see preceding entries in 4.h.(1)].
4.i.	<b>Safety Documentation and Records.</b> The organization must establish and maintain information, in paper or electronic form, to describe:			1	
4.i.(1)	safety policies;	§145.201 Privileges and limitations of certificate	(a) A certificated repair station may— (1) Perform maintenance, preventive maintenance, or alterations in accordance with part 43 on any article for which it is rated and within the limitations in its operations specifications.	0	Part 145 in its self is not a safety policy; however, compliance with Part 145 is mandatory. This results in airworthy articles is directly related to safety.
4.i.(1)(a)	safety objectives;	§145.201 Privileges and limitations of certificate	(a) A certificated repair station may— (3) Approve for return to service any article for which it is rated after it has performed maintenance, preventive maintenance, or an alteration in accordance with part 43.	0	Currently not required in Part 145. Safety Objective may be N/A because Part 145 objectives are zero tolerance.

### Assessment Rating

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Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
4.i.(1)(c)	SMS requirements;	§145.213 Inspection of maintenance, preventive maintenance, or alterations	(a) A certificated repair station must inspect each article upon which it has performed maintenance, preventive maintenance, or alterations as described in paragraphs (b) and (c) of this section before approving that article for return to service. (b) A certificated repair station must certify on an article's maintenance release that the article is airworthy with respect to the maintenance, preventive maintenance, or alterations performed after— (1) The repair station performs work on the article; and (2) An inspector inspects the article on which the repair station has performed work and determines it to be airworthy with respect to the work performed.	0	Currently not required in Part 145. Safety Objective may be N/A because Part 145 objectives are zero tolerance.
4.i.(1)(d)	safety procedures and processes; [Procedure - A specified way to carry out an activity or a process (ref. VS 8000.367, Appendix A: Definitions).] [Process - A set of interrelated or interacting activities that transforms inputs into outputs (ref. VS 8000.367, Appendix A: Definitions).]	§43.13 Performance rules (general)  (PROCESS) §145.211 Quality control system  (PROCEDURES) §145.211 Quality control system	(a) A certificated repair station must establish and maintain a quality control system acceptable to the FAA that ensures the airworthiness of the articles on which the repair station or any of its contractors performs maintenance, preventive maintenance, or alterations. (b) Repair station personnel must follow the quality control system when performing maintenance, preventive maintenance, or alterations under the repair station certificate and operations specifications. (c) A certificated repair station must prepare and keep current a quality control manual in a format acceptable to the FAA that includes the following: (1) A description of the system and procedures used for— (i) Inspecting incoming raw materials to ensure acceptable quality; (ii) Performing preliminary inspection of all articles that are maintained; (iii) Inspecting all articles that have been involved in an accident for hidden damage before maintenance, preventive maintenance, or alteration is performed; (iv) Establishing and maintaining proficiency of inspection personnel; (v) Establishing and maintaining current technical data for maintaining articles; (vi) Qualifying and surveilling noncertificated persons who perform maintenance, prevention maintenance, or alterations for the repair station; (vii) Performing final inspection and return to service of maintained articles; (viii) Calibrating measuring and test equipment used in maintaining articles, including the intervals at which the equipment will be calibrated; and (ix) Taking corrective action on deficiencies; (2) References, where applicable, to the manufacturer's inspection standards for a particular article, including reference to any data specified by that manufacturer; (3) A sample of the inspection and maintenance forms and instructions for completing such forms or a reference to a separate forms manual; and (4) Procedures for revising the quality control manual required under this section and notifying the certificate holding district office of the revisions, including how often the certificate holding district office will be notified of revisions. (d) A certificated repair station must notify its certificate holding district office of revisions to its quality control manual.	1	The infrastructure in provided; the specific aviation safety requirement is not.

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Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
		<p>\$145.209 Repair station manual contents</p>	<p>A. certificated repair station's manual must include the following:                      (a) An organizational chart identifying—                      (1) Each management position with authority to act on behalf of the repair station,                      (2) The area of responsibility assigned to each management position, and                      (3) The duties, responsibilities, and authority of each management position;                      (b) Procedures for maintaining and revising the rosters required by §145.161;                      (c) A description of the certificated repair station's operations, including the housing, facilities, equipment, and materials as required by subpart C of this part;                      (d) Procedures for—                      (1) Revising the capability list provided for in §145.215 and notifying the certificate holding district office of revisions to the list, including how often the certificate holding district office will be notified of revisions; and                      (2) The self-evaluation required under §145.215(c) for revising the capability list, including methods and frequency of such evaluations, and procedures for reporting the results to the appropriate manager for review and action;                      (e) Procedures for revising the training program required by §145.163 and submitting revisions to the certificate holding district office for approval;                      (f) Procedures to govern work performed at another location in accordance with §145.203;                      (g) Procedures for maintenance, preventive maintenance, or alterations performed under §145.205;                      (h) Procedures for—                      (1) Maintaining and revising the contract maintenance information required by §145.217(a)(2)(i), including submitting revisions to the certificate holding district office for approval; and                      (2) Maintaining and revising the contract maintenance information required by §145.217(a)(2)(ii) and notifying the certificate holding district office of revisions to this information, including how often the certificate holding district office will be notified of revisions;                      (i) A description of the required records and the recordkeeping system used to obtain, store, and retrieve the required records;                      (j) Procedures for revising the repair station's manual and notifying its certificate holding district office of revisions to the manual, including how often the certificate holding district office will be notified of revisions; and                      (k) A description of the system used to identify and control sections of the repair station manual.</p>		
4.i.(1)(e)	responsibilities and authorities for safety procedures and processes; and	\$145.151 Personnel requirements	<p>Each certificated repair station must—                      (a) Designate a repair station employee as the accountable manager;                      (b) Provide qualified personnel to plan, supervise, perform, and approve for return to service the maintenance, preventive maintenance, or alterations performed under the repair station certificate and operations specifications;                      (c) Ensure it has a sufficient number of employees with the training or knowledge and experience in the performance of maintenance, preventive maintenance, or alterations authorized by the repair station certificate and operations specifications to ensure all work is performed in accordance with part 43; and                      (d) Determine the abilities of its noncertificated employees performing maintenance functions based on training, knowledge, experience, or practical tests.</p>	1	The infrastructure in provided; the specific aviation safety requirement is not.
		\$145.153 Supervisory personnel requirements	<p>(a) A certificated repair station must ensure it has a sufficient number of supervisors to direct the work performed under the repair station certificate and operations specifications. The supervisors must oversee the work performed by any individuals who are unfamiliar with the methods, techniques, practices, aids, equipment, and tools used to perform the maintenance, preventive maintenance, or alterations.</p>		
4.i.(1)(f)	interaction/interfaces between safety procedures and processes.	\$145.211 Quality control system	<p>(a) A certificated repair station must establish and maintain a quality control system acceptable to the FAA that ensures the airworthiness of the articles on which the repair station or any of its contractors performs maintenance, preventive maintenance, or alterations.                      (b) Repair station personnel must follow the quality control system when performing maintenance, preventive maintenance, or alterations under the repair station certificate and operations specifications.</p>	0	

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Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
4.i.(2)	The organization must document SMS outputs in records.	\$145.219 Recordkeeping	(a) A certificated repair station must retain records in English that demonstrate compliance with the requirements of part 43. The records must be retained in a format acceptable to the FAA. (b) A certificated repair station must provide a copy of the maintenance release to the owner or operator of the article on which the maintenance, preventive maintenance, or alteration was performed.	1	The infrastructure in provided; the specific aviation safety requirement is not.
4.i.(3)	The organization must maintain documents and records in accordance with document and record management policies specified by the oversight organization.	\$145.219 Recordkeeping	(a) A certificated repair station must retain records in English that demonstrate compliance with the requirements of part 43. The records must be retained in a format acceptable to the FAA. (c) A certificated repair station must retain the records required by this section for at least 2 years from the date the article was approved for return to service.	1	The infrastructure in provided; the specific aviation safety requirement is not.
5	<b>Safety Risk Management.</b> FN3 - In general, the extent and structure of safety risk assessment that is necessary will be greater when the item/issue to be assessed is more complex and effects of the hazards are more severe. The intent of the SRM process is to focus on the areas of greatest concern from a safety perspective, taking into account safety risk, complexity, operational scope (impact to the air transportation system), etc.	Order 8000.367 - Appendix A	<b>Safety Risk Management (SRM)</b> - A formal process within the SMS composed of describing the system, identifying the hazards, assessing the risk, analyzing the risk, and controlling the risk. The SRM process is embedded in the processes used to provide the product / service; it is not a separate / distinct process. (ref. Order VS 8000.367, Appendix A: Definitions)	0	
5.a.	SRM must, at a minimum, include the following processes:				
5.a.(1)	describe system;	Order 8000.367 - Appendix A	<b>System</b> - An integrated set of constituent elements that are combined in an operational or support environment to accomplish a defined objective. These elements include people, hardware, software, firmware, information, procedures, facilities, services and other support facets.	1	The infrastructure in provided; the specific SRM requirement is not.
		\$145.103 Housing and facilities requirements			
		\$145.109 Equipment, materials, and data requirements			
		\$145.151 Personnel requirements			
		\$145.207 Repair station manual	(a) A certificated repair station must prepare and follow a repair station manual acceptable to the FAA.		
		\$145.209 Repair station manual contents			
		\$145.211 Quality control system			
5.a.(2)	identify hazards;	Order 8000.367 - Appendix A	<b>Hazard</b> - Any existing or potential condition that can lead to injury, illness or death to people; damage to or loss of a system, equipment, or property; or damage to the environment. A hazard is a condition that is a prerequisite to an accident or incident.	0	
5.a.(3)	analyze safety risk;	Order 8000.367 - Appendix A	<b>Safety risk</b> - The composite of predicted severity and likelihood of the potential effect of a hazard.	0	
		\$21.3 Reporting of failures, malfunctions, and defects	(e) Except as provided in paragraph (d) of this section, the holder of a Type Certificate (including a Supplemental Type Certificate), a Parts Manufacturer Approval (PMA), or a TSO authorization, or the licensee of a Type Certificate shall report any failure, malfunction, or defect in any product, part, process, or article manufactured by it that it determines has resulted in any of the occurrences listed in paragraph (c) of this section.		
		\$145.221 Service difficulty reports	(e) A certificated repair station must report to the FAA within 96 hours after it discovers any serious failure, malfunction, or defect of an article. The report must be in a format acceptable to the FAA.		

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5.a.(4) 5.a.(5)	assess safety risk; and control/mitigate safety risk.	§21.50 Instructions for continued airworthiness §145.1 Applicability §145.211 Quality control system §43.13 Performance rules (general)	ICA includes Airworthiness Limitations section, an element of the type design per §21.31(c), and servicing information, scheduling information which provides recommended periods for cleaning, inspecting, adjusting, testing, lubricating, wear tolerances, troubleshooting, and list of tools and equipment. This part describes how to obtain a repair station certificate. This part also contains the rules a certificated repair station must follow related to its performance of maintenance, preventive maintenance, or alterations of an aircraft, airframe, engine, propeller, appliance, or component part to which part 43 applies. It also applies to any person who holds, or is required to hold, a repair station certificate issued under this part. (a) A certificated repair station must establish and maintain a quality control system acceptable to the FAA that ensures the airworthiness of the articles on which the repair station or any of its contractors performs maintenance, preventive maintenance, or alterations. (b) Repair station personnel must follow the quality control system when performing maintenance, preventive maintenance, or alterations under the repair station certificate and operations specifications. (a) requires that the Instructions for Continued Airworthiness be used when performing maintenance, preventive maintenance, or alteration on any aircraft, engine, propeller, or part thereof. When properly adhered to, "safety risk" is controlled and mitigated.	0 0	Part 145 in its self does not provide an SRM system; however, compliance with Part 145 is mandatory. This results in airworthy articles and is directly related to safety.
5.b.	The elements of the SRM process must be applied, either qualitatively or quantitatively, to:	initial designs of systems, organizations and products;	<b>SYSTEMS:</b> The foundation of civil aviation in the U.S. is <b>airworthiness</b> ; conformance to type certificate for products and conformance to type design for component parts of products, and in condition for safe operation. Products (type certificated aircraft, aircraft engines, and propellers - and all parts comprising those products) are designed according to the appropriate <b>Airworthiness Standards</b> : 14CFR Part 23 for Normal, Utility, Acrobatic, and Commuter Category Airplanes; Part 25 for Transport Category Airplanes; Part 27 for Normal Category Rotorcraft; Part 29 for Transport Category Rotorcraft; and, Part 33 for Aircraft Engines. The products are type certificated according to the stringent requirements contained in 14CFR Part 21 - Certification Procedures for Products and Parts.  <b>System</b> - An integrated set of constituent elements that are combined in an operational or support environment to accomplish a defined objective. These elements include people, hardware, software, firmware, information, procedures, facilities, services and other support facets.  §91.405(b) Each owner or operator of an aircraft— (b) Shall ensure that maintenance personnel make appropriate entries in the aircraft maintenance records indicating the aircraft has been approved for return to service; §43.11(e) Maintenance record entries. The person approving or disapproving for return to service an aircraft, airframe, aircraft engine, propeller, appliance, or component part after any inspection performed in accordance with part 91, 125, §135.411(a)(1), or §135.419 shall make an entry in the maintenance record of that equipment containing the following information: (4) Except for progressive inspections, if the aircraft is found to be airworthy and approved for return to service, the following or a similarly worded statement—"I certify that this aircraft has been inspected in accordance with (insert type) inspection and was determined to be in airworthy condition."  §121.367 Each certificate holder shall have an inspection program and a program covering other maintenance, preventive maintenance, and alterations that ensures that— (c) Each aircraft released to service is airworthy and has been properly maintained for operation under this part. §121.709 (a) No certificate holder may operate an aircraft after maintenance, preventive maintenance or alterations are performed on the aircraft unless the certificate holder, or the person with whom the certificate holder arranges for the performance of the maintenance, preventive maintenance, or alterations, prepares or causes to be prepared— (1) An airworthiness release, or (2) An appropriate entry in the aircraft log.	0 0	The references are provided for areas of potential expansion to include the SRM.
5.b.(1)	The elements of the SRM process must be applied, either qualitatively or quantitatively, to:	initial designs of systems, organizations and products;	<b>SYSTEMS:</b> The foundation of civil aviation in the U.S. is <b>airworthiness</b> ; conformance to type certificate for products and conformance to type design for component parts of products, and in condition for safe operation. Products (type certificated aircraft, aircraft engines, and propellers - and all parts comprising those products) are designed according to the appropriate <b>Airworthiness Standards</b> : 14CFR Part 23 for Normal, Utility, Acrobatic, and Commuter Category Airplanes; Part 25 for Transport Category Airplanes; Part 27 for Normal Category Rotorcraft; Part 29 for Transport Category Rotorcraft; and, Part 33 for Aircraft Engines. The products are type certificated according to the stringent requirements contained in 14CFR Part 21 - Certification Procedures for Products and Parts.  <b>System</b> - An integrated set of constituent elements that are combined in an operational or support environment to accomplish a defined objective. These elements include people, hardware, software, firmware, information, procedures, facilities, services and other support facets.  §91.405(b) Each owner or operator of an aircraft— (b) Shall ensure that maintenance personnel make appropriate entries in the aircraft maintenance records indicating the aircraft has been approved for return to service; §43.11(e) Maintenance record entries. The person approving or disapproving for return to service an aircraft, airframe, aircraft engine, propeller, appliance, or component part after any inspection performed in accordance with part 91, 125, §135.411(a)(1), or §135.419 shall make an entry in the maintenance record of that equipment containing the following information: (4) Except for progressive inspections, if the aircraft is found to be airworthy and approved for return to service, the following or a similarly worded statement—"I certify that this aircraft has been inspected in accordance with (insert type) inspection and was determined to be in airworthy condition."  §121.367 Each certificate holder shall have an inspection program and a program covering other maintenance, preventive maintenance, and alterations that ensures that— (c) Each aircraft released to service is airworthy and has been properly maintained for operation under this part. §121.709 (a) No certificate holder may operate an aircraft after maintenance, preventive maintenance or alterations are performed on the aircraft unless the certificate holder, or the person with whom the certificate holder arranges for the performance of the maintenance, preventive maintenance, or alterations, prepares or causes to be prepared— (1) An airworthiness release, or (2) An appropriate entry in the aircraft log.	0 0	The references are provided for areas of potential expansion to include the SRM.

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	<p>\$135.425 Each certificate holder shall have an inspection program and a program covering other maintenance, preventive maintenance, and alterations, that ensures that—</p> <p>(c) Each aircraft released to service is airworthy and has been properly maintained for operation under this part.</p> <p>\$ 145.103 Housing and facilities requirements</p> <p>\$ 145.109 Equipment, materials, and data requirements</p> <p>\$ 145.151 Personnel requirements</p> <p>\$ 145.209 Repair station manual contents</p> <p>\$ 145.211 Quality control system</p> <p>\$145.213 (a) A certificated repair station must inspect each article upon which it has performed maintenance, preventive maintenance, or alterations as described in paragraphs (b) and (c) of this section before approving that article for return to service.</p> <p>(b) A certificated repair station must certify on an article's maintenance release that the article is airworthy with respect to the maintenance, preventive maintenance, or alterations performed after—</p> <p>(1) The repair station performs work on the article; and</p> <p>(2) An inspector inspects the article on which the repair station has performed work and determines it to be airworthy with respect to the work performed.</p>	<p><b>PRODUCTS:</b> A newly manufactured aircraft is issued its original <b>airworthiness</b> certificate when it is found to conform to its type design and to be in condition for safe operation. [ref. §21.183(a) &amp; (b)]. When it enters service, maintaining its <b>airworthiness</b>, i.e. maintaining conformance to its type certificate (and for all installed component parts, maintaining their conformance to their respective type designs), and its condition for safe operation, lies in the realm of the maintenance provider. The primary means of continuing the <b>airworthiness</b> of in-service aircraft is by using "the methods, techniques, and practices prescribed in the current manufacturer's maintenance manual or <b>Instructions for Continued Airworthiness</b> (required by §21.50) prepared by its manufacturer." [ref. §43.13(a)]</p>	<p>the development of safety operational procedures;</p>	0	
5.b.(2)		<p>§43.3 Persons authorized to perform maintenance, preventive maintenance, rebuilding, and alterations.</p>	<p>(a) Except as provided in this section and §43.17, no person may maintain, rebuild, alter, or perform preventive maintenance on an aircraft, airframe, aircraft engine, propeller, appliance, or component part to which this part applies. Those items, the performance of which is a major alteration, a major repair, or preventive maintenance, are listed in appendix A.</p> <p>(b) The holder of a mechanic certificate may perform maintenance, preventive maintenance, and alterations as provided in Part 65 of this chapter.</p> <p>(c) The holder of a repairman certificate may perform maintenance, preventive maintenance, and alterations as provided in part 65 of this chapter.</p> <p>(d) A person working under the supervision of a holder of a mechanic or repairman certificate may perform the maintenance, preventive maintenance, and alterations that his supervisor is authorized to perform, if the supervisor personally observes the work being done to the extent necessary to ensure that it is being done properly and if the supervisor is readily available, in person, for consultation. However, this paragraph does not authorize the performance of any inspection required by Part 91 or Part 125 of this chapter or any inspection performed after a major repair or alteration.</p> <p>(e) The holder of a repair station certificate may perform maintenance, preventive maintenance, and alterations as provided in Part 145 of this chapter.</p> <p>(f) The holder of an air carrier operating certificate or an operating certificate issued under Part 121 or 135, may perform maintenance, preventive maintenance, and alterations as provided in Part 121 or 135.</p>		
		<p>§43.5 Approval for return to service after maintenance, preventive maintenance, rebuilding, or alteration.</p>	<p>No person may approve for return to service any aircraft, airframe, aircraft engine, propeller, or appliance, that has undergone maintenance, preventive maintenance, rebuilding, or alteration unless—</p> <p>(a) The maintenance record entry required by §43.9 or §43.11, as appropriate, has been made;</p> <p>(b) The repair or alteration form authorized by or furnished by the Administrator has been executed in a manner prescribed by the Administrator; and</p> <p>(c) If a repair or an alteration results in any change in the aircraft operating limitations or flight data contained in the approved aircraft flight manual, those operating limitations or flight data are appropriately revised and set forth as prescribed in §91.9 of this chapter.</p>		

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		<p>§91.3 Responsibility and authority of the pilot in command</p> <p>§43.13 Performance rules (general)</p>	<p>(a) The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft.</p> <p>(b) In an in-flight emergency requiring immediate action, the pilot in command may deviate from any rule of this part to the extent required to meet that emergency.</p> <p>(c) Each pilot in command who deviates from a rule under paragraph (b) of this section shall, upon the request of the Administrator, send a written report of that deviation to the Administrator.</p> <p>(a) Each person performing maintenance, alteration, or preventive maintenance on an aircraft, engine, propeller, or appliance shall use the methods, techniques, and practices prescribed in the current manufacturer's maintenance manual or instructions for Continued Airworthiness prepared by its manufacturer, or other methods, techniques, and practices acceptable to the Administrator, except as noted in §43.16. He shall use the tools, equipment, and test apparatus necessary to assure completion of the work in accordance with accepted industry practices. If special equipment or test apparatus is recommended by the manufacturer involved, he must use that equipment or apparatus or its equivalent acceptable to the Administrator.</p> <p>(b) Each person maintaining or altering, or performing preventive maintenance, shall do that work in such a manner and use materials of such a quality, that the condition of the aircraft, airframe, aircraft engine, propeller, or appliance worked on will be at least equal to its original or properly altered condition (with regard to aerodynamic function, structural strength, resistance to vibration and deterioration, and other qualities affecting airworthiness).</p> <p>(c) Special provisions for holders of air carrier operating certificates and operating certificates issued under the provisions of Part 121 or 135 and Part 129 operators holding operations specifications. Unless otherwise notified by the administrator, the methods, techniques, and practices contained in the maintenance manual or the maintenance part of the manual of the holder of an air carrier operating certificate or an operating certificate under Part 121 or 135 and Part 129 operators holding operations specifications (that is required by its operating specifications to provide a continuous airworthiness maintenance and inspection program) constitute acceptable means of compliance with this section.</p>		
		§91.7 Civil Aircraft Airworthiness	<p>(a) No person may operate a civil aircraft unless it is in an airworthy condition.</p> <p>(b) The pilot in command of a civil aircraft is responsible for determining whether that aircraft is in condition for safe flight. The pilot in command shall discontinue the flight when unairworthy mechanical, electrical, or structural conditions occur.</p> <p>(a) Except as provided in paragraph (c) of this section, no person may operate an aircraft unless, within the preceding 12 calendar months, it has had—</p> <p>(1) An annual inspection in accordance with part 43 of this chapter and has been approved for return to service by a person authorized by §43.7 of this chapter; or</p> <p>(2) An inspection for the issuance of an airworthiness certificate in accordance with part 21 of this chapter.</p>		
		§91.409 Inspections	<p>Each certificate holder shall have an inspection program and a program covering other maintenance, preventive maintenance, and alterations that ensures that—</p> <p>(a) Maintenance, preventive maintenance, and alterations performed by it, or by other persons, are performed in accordance with the certificate holder's manual;</p> <p>(b) Competent personnel and adequate facilities and equipment are provided for the proper performance of maintenance, preventive maintenance, and alterations; and</p> <p>(c) Each aircraft released to service is airworthy and has been properly maintained for operation under this part.</p>		
		§121.367 Maintenance, preventive maintenance, and alterations programs.	<p>Each certificate holder shall have an inspection program and a program covering other maintenance, preventive maintenance, and alterations, that ensures that—</p> <p>(a) Maintenance, preventive maintenance, and alterations performed by it, or by other persons, are performed under the certificate holder's manual;</p> <p>(b) Competent personnel and adequate facilities and equipment are provided for the proper performance of maintenance, preventive maintenance, and alterations; and</p> <p>(c) Each aircraft released to service is airworthy and has been properly maintained for operation under this part.</p>		
		§135.425 Maintenance, preventive maintenance, and alteration programs.	<p>Each certificate holder shall have an inspection program and a program covering other maintenance, preventive maintenance, and alterations, that ensures that—</p> <p>(a) Maintenance, preventive maintenance, and alterations performed by it, or by other persons, are performed under the certificate holder's manual;</p> <p>(b) Competent personnel and adequate facilities and equipment are provided for the proper performance of maintenance, preventive maintenance, and alterations; and</p> <p>(c) Each aircraft released to service is airworthy and has been properly maintained for operation under this part.</p>		
		§145.207 Repair station manual	<p>(a) A certificated repair station must prepare and follow a repair station manual acceptable to the FAA.</p>		

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## Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR

Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
		<p>(g) Procedures for maintenance, preventive maintenance, or alterations performed under §145.205;</p> <p>(h) Procedures for—</p> <p>(1) Maintaining and revising the contract maintenance information required by §145.217(a)(2)(i), including submitting revisions to the certificate holding district office for approval; and</p> <p>(2) Maintaining and revising the contract maintenance information required by §145.217(a)(2)(ii) and notifying the certificate holding district office of revisions to this information, including how often the certificate holding district office will be notified of revisions;</p>			
5.b.(3)	<p>hazards that are identified in the safety assurance functions (described in Chapter 6); and</p>	<p>§145.209 Repair station manual contents</p> <p>§145.211 Quality control system</p> <p>Order 8000.367 - Appendix A</p> <p>§21.3 Reporting of failures, malfunctions, and defects</p> <p>§145.221 Service difficulty reports</p>		0	
5.b.(4)	<p>planned changes to the production/operational system, including introduction of new products and procedures, to identify hazards associated with those changes.</p>	<p>§145.211 Quality control system</p> <p>§145.209 Repair station manual contents</p>		0	
5.c.	<p>The organization must establish feedback loops between assurance functions (described in Chapter 6) to evaluate the effectiveness of safety risk controls. [reference Figure B-1]</p>	<p>§145.213 Inspection of maintenance, preventive maintenance, or alterations.</p>		0	<p>The references are provided for areas of potential expansion to include the SRM.</p>
5.d.	<p>The organization must define a process for risk acceptance.</p>	<p>§145.211 Quality control system</p>		0	
5.d.(1)	<p>The organization must define acceptable and unacceptable levels of safety risk. Descriptions must be established for severity levels and likelihood levels.</p>				
5.d.(2)	<p>The organization must define levels of management that can make safety risk acceptance decisions.</p>				

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## Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR

Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
5.d.(3)	The organization must define the level of safety risk that is acceptable in the short-term, while long-term safety risk control/mitigation plans are developed and implemented.	Safety risk (The composite of predicted severity and likelihood of the potential effect of a hazard. [ref. Order VS 8000.367, Appendix A: Definitions]) is NOT an element of continuing airworthiness / maintenance. Airworthiness Standards, including Parts 23, 25, and 33, contain quantitative design requirements to ensure safe flight and landing in the event that any failure condition occurs. Those requirements are contained in a products type certificate, an element of airworthiness. The Instructions for Continued Airworthiness [also part of the type certificate, and required by §21.50(b)], through the exhaustive Maintenance Review Board process (for transport category aircraft) are developed to ensure realization of the inherent safety and reliability levels of the equipment (as designed, certificated, and manufactured); and to restore safety and reliability to their inherent levels when deterioration has occurred.		0	Part 145 in its self does not provide an SRM system; however, compliance with Part 145 is mandatory. This results in airworthy articles and is directly related to safety.
5.e.	If applicable, the organization must establish procedures to obtain oversight organization approval for those planned changes that require oversight approval prior to implementation (in accordance with Chapter 4, Section f).	<p>§145.105 Change of location, housing, or facilities.</p> <p>§145.161 Records of management, supervisory, and</p> <p>§145.207 Repair station manual</p> <p>§145.209 Repair station manual contents.</p>	<p>(a) A certificated repair station may not change the location of its housing without written approval from the FAA.</p> <p>(b) A certificated repair station may not make any changes to its housing or facilities required by §145.103 that could have a significant effect on its ability to perform the maintenance, preventive maintenance, or alterations under its repair station certificate and operations specifications without written approval from the FAA.</p> <p>(b) Within 5 business days of the change, the rosters required by this section must reflect changes caused by termination, reassignment, change in duties or scope of assignment, or addition of personnel.</p> <p>(e) A certificated repair station must notify its certificate holding district office of each revision of its repair station manual in accordance with the procedures required by §145.209(j).</p> <p>A certificated repair station's manual must include the following:</p> <p>(d) Procedures for—</p> <p>(1) Revising the capability list provided for in §145.215 and notifying the certificate holding district office of revisions to the list, including how often the certificate holding district office will be notified of revisions; and</p> <p>(h) Procedures for—</p> <p>(1) Maintaining and revising the contract maintenance information required by §145.217(a)(2)(i), including submitting revisions to the certificate holding district office for approval; and</p> <p>(2) Maintaining and revising the contract maintenance information required by §145.217(a)(2)(ii) and notifying the certificate holding district office of revisions to this information, including how often the certificate holding district office will be notified of revisions;</p> <p>(j) Procedures for revising the repair station's manual and notifying its certificate holding district office of revisions to the manual, including how often the certificate holding district office will be notified of revisions.</p> <p>(c) A certificated repair station must prepare and keep current a quality control manual in a format acceptable to the FAA that includes the following:</p> <p>(4) Procedures for revising the quality control manual required under this section and notifying the certificate holding district office of the revisions, including how often the certificate holding district office will be notified of revisions.</p> <p>(d) A certificated repair station must notify its certificate holding district office of revisions to its quality control manual.</p> <p>(d) Upon listing an additional article on its capability list, the repair station must provide its certificate holding district office with a copy of the revised list in accordance with the procedures required in §145.209(d)(1).</p>	<p>1</p> <p>We believe the reference to "Chapter 4" is actually reference to "Item 4" of Appendix B.</p> <p>The infrastructure in provided; the specific aviation safety requirement is not.</p>	
5.f.	The safety risk of identified hazards must be deemed acceptable, prior to implementation of the following items in the production/operational system:	§145.211 Quality control system		1	
5.f.(1)	new system designs;	§145.51 Application for certificate	<p>System - An integrated set of constituent elements that are combined in an operational or support environment to accomplish a defined objective. These elements include people, hardware, software, firmware, information, procedures, facilities, services and other support facets.</p> <p>New "system designs," i.e. new repair stations, are FAA certificated.</p> <p>(a) An application for a repair station certificate and rating must be made in a format acceptable to the FAA and must include the following...</p>	0	

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**Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR**

Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
5.f.(2)	changes to existing system designs;	<p>§145.109 Equipment, materials, and data requirements</p> <p>§145.151 Personnel requirements</p> <p>§145.57 Amendment to or transfer of certificate</p>	<p>§145.105 Change of location, housing, or facilities</p> <p>§145.161 Records of management, supervisory, and inspection personnel</p> <p>§145.207 Repair station manual</p> <p>§145.211 Quality control system</p> <p>§145.215 Capability list</p> <p>§145.217 Contract maintenance</p>	1	The infrastructure in provided; the specific aviation safety requirement is not.
5.f.(3)	new operations/procedures; and	Same as Order sections 5.f.(1) and 5.f.(2) immediately above.		1	The infrastructure in provided; the specific aviation safety requirement is not.
5.f.(4)	modified operations/procedures.			1	The infrastructure in provided; the specific aviation safety requirement is not.
5.g.	The SRM process may allow AVS or AVS services/offices to take interim immediate action to mitigate existing safety risk.	<p>§39.5 When does FAA issue airworthiness directives?</p> <p>§21.99 Required design changes</p>	<p>FAA issues an airworthiness directive addressing a product when we (FAA) find that:</p> <p>(a) An unsafe condition exists in the product; and</p> <p>(b) The condition is likely to exist or develop in other products of the same type design.</p> <p>(e) When an Airworthiness Directive is issued under Part 39 the holder of the type certificate for the product concerned must—</p> <p>(1) If the Administrator finds that design changes are necessary to correct the unsafe condition of the product, and upon his request, submit appropriate design changes for approval; and</p> <p>(2) Upon approval of the design changes, make available the descriptive data covering the changes to all operators of products previously certificated under the type certificate.</p> <p>(b) In a case where there are no current unsafe conditions, but the Administrator or the holder of the type certificate finds through service experience that changes in type design will contribute to the safety of the product, the holder of the type certificate may submit appropriate design changes for approval. Upon approval of the changes, the manufacturer shall make information on the design changes available to all operators of the same type of product.</p>	1	The infrastructure in provided; the specific aviation safety requirement is not.

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Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
5.h.	<p><b>Describe System.</b> The system description must be completed to the level necessary to identify hazards.</p> <p><b>FN4 -</b> While it is recognized that identification of every conceivable hazard is impractical, organizations are expected to exercise diligence in identifying and controlling significant and reasonably foreseeable hazards related to their operations. Describing the system involves the act of bounding the system (i.e., defining what the system actually is). The definition process is a purely subjective one. Defining a system requires a definition of its boundary and its components.</p>	<p>The only possible meaning of hazard is with respect to any existing or potential condition that could lead to injury, illness or death to people during the operation of a civil aircraft. The damage to or loss of a system, equipment, or property likewise is with respect to the operation of civil aircraft. When a certificated repair station approves for return to service any article for which it is rated after it has performed maintenance, preventive maintenance, or an alteration, it must certify on the article's maintenance release that the article is <b>airworthy</b> with respect to the maintenance, preventive maintenance, or alterations performed (ref §145.213(b)). <b>Airworthy</b> means that the article is at least equal to its original or properly altered condition; conforming to its type design, and in condition for safe operation. Conforming to its type design means all failures that could reasonably be expected to occur were analyzed and the article was designed and manufactured such that the probability of those failures occurring would not be greater than 1 per 100,000,000 engine flight hours.</p>	<p><b>Hazard</b> – Any existing or potential condition that can lead to injury, illness or death to people; damage to or loss of a system, equipment, or property; or damage to the environment. A hazard is a condition that is a prerequisite to an accident or incident.</p> <p>(a) (1) The applicant must analyze the engine, including the control system, to assess the likely consequences of all failures that can reasonably be expected to occur. This analysis will take into account, if applicable:</p> <ul style="list-style-type: none"> <li>(i) Aircraft-level devices and procedures assumed to be associated with a typical installation. Such assumptions must be stated in the analysis.</li> <li>(ii) Consequential secondary failures and latent failures.</li> <li>(3) The applicant must show that hazardous engine effects are predicted to occur at a rate not in excess of that defined as extremely remote (probability range of 10e(-7) to 10e(-9) [1 per 10,000,000 engine flight hours to 1 per 1,000,000,000 flight hours]). Since the estimated probability for individual failures may be insufficiently precise to enable the applicant to assess the total rate for hazardous engine effects, compliance may be shown by demonstrating that the probability of a hazardous engine effect arising from an individual failure can be predicted to be not greater than 10e(-8) [1 per 100,000,000] engine flight hours.</li> </ul>	0	
5.i.	<p><b>Identify Hazards.</b> Hazards must be identified within the system as described in Section h.</p>	Order 8000.367 - Appendix A	As indicated immediately above, hazards are identified and analyzed, and their effects are considered in the design and certification of aircraft and engines. When maintenance, preventive maintenance, rebuilding, and alterations are performed in accordance with 14CFR parts 21, 43, 121, 135 and 145, hazards are coincidentally addressed / mitigated and therefore may not be considered in maintenance.	1	Because of the prescriptive nature of Part 145 each area of concern is addressed reactively; but, not proactively.
5.j.	<p><b>Analyze Safety Risk.</b> The safety risk analysis process must include analyses of:</p>	\$33.75 Safety Analysis			
5.j.(1)	<p>existing safety risk controls;</p>				
5.j.(2)	<p>(Safety risk control) – A characteristic of a system that reduces safety risk. Controls may include process design, equipment modification, work procedures, training or protective device. (ref. Appendix A: Definitions; Order VS 8000.367)</p>				
5.j.(3)	<p>contributing factors; and</p>				
5.j.(3)(a)	<p>the safety risk of reasonably likely outcomes from the existence of a hazard, to include estimation of the:</p>				
5.j.(3)(b)	<p>likelihood and severity</p>				
5.k.	<p><b>Assess Safety Risk.</b> Each identified hazard must be assessed for its safety risk acceptability (as defined per requirements listed in Section d).</p>				
	<p>(Safety risk) – The composite of predicted severity and likelihood of the potential effect of a hazard. (ref. Appendix A: Definitions, Order VS 8000.367)</p>				Because of the nature of the design requirements; the product is fully addressed; but, the processes are not. SMS can be used as an acceptable means of compliance for making the decisions that are required by Part 145.

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Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
5.1.	<b>Control/Mitigate Safety Risk.</b> Safety risk control/mitigation plans must be defined for hazards identified with unacceptable risk.				
5.1.(1)	Substitute risk must be evaluated in the creation of safety risk controls/mitigations.				
5.1.(2)	[Substitute risk – Risk unintentionally created as a consequence of safety risk control(s)] [Safety risk control – A characteristic of a system that reduces safety risk. Controls may include process design, equipment modification, work procedures, training or protective device.], (ref. Appendix A: Definitions, Order VS 8000.367)]				
5.1.(3)	The safety risk control/mitigation must be evaluated to ensure that safety requirements have been met.				
5.1.(4)	Once safety risk control/mitigation plans are implemented, they must be monitored to ensure that safety risk controls have the desired effect.				
<b>6</b>	<b>Safety Assurance.</b> [ref. Chapter 4 of the Order] Figure B-1 illustrates how Safety Assurance functions (described in Sections b-k) are linked to the SRM process (described in Chapter 5).			<b>1</b>	
<b>6.a.</b>	<b>General Requirements.</b> The organization must monitor its systems, operations and products/services to:			<b>1</b>	
6.a.(1)	Identify new hazards;	§21.3 Reporting of failures, malfunctions, and defects §21.99 Required design changes	(a) Except as provided in paragraph (d) of this section, the holder of a Type Certificate (including a Supplemental Type Certificate), a Parts Manufacturer Approval (PMA), or a TSO authorization, or the licensee of a Type Certificate shall report any failure, malfunction, or defect in any product, part, process, or article manufactured by it that it determines has resulted in any of the occurrences listed in paragraph (c) of this section.  (a) When an Airworthiness Directive is issued under Part 39 the holder of the type certificate for the product concerned must— (1) If the Administrator finds that design changes are necessary to correct the unsafe condition of the product, and upon his request, submit appropriate design changes for approval; and (2) Upon approval of the design changes, make available the descriptive data covering the changes to all operators of products previously certificated under the type certificate.  (a) A certificated repair station must report to the FAA within 96 hours after it discovers any serious failure, malfunction, or defect of an article. The report must be in a format acceptable to the FAA.  (a) Each certificate holder shall report the occurrence or detection of each failure, malfunction, or defect concerning— (a) Each certificate holder shall report the occurrence or detection of each failure, malfunction, or defect in an aircraft concerning— (a) A certificated repair station must retain records in English that demonstrate compliance with the requirements of part 43. The records must be retained in a format acceptable to the FAA.	<b>1</b>	The Service Difficulty Reporting system is a proactive system identifying hazards before the become an accident or incident. Maintenance is contributing to the process; however, there is no feedback loop (closed loop system).
6.a.(2)	Measure the effectiveness of safety risk controls; [Safety risk control – A characteristic of a system that reduces safety risk. Controls may include process design, equipment modification, work procedures, training or protective device. (ref. Appendix A: Definitions, Order VS 8000.367)]	§145.221 Service difficulty reports §121.703 Service difficulty reports §135.415 Service difficulty reports 145.219 Recordkeeping §43.13 Performance rules (general)	(a) A certificated repair station must retain records in English that demonstrate compliance with the requirements of part 43. The records must be retained in a format acceptable to the FAA.  (b) Each person maintaining or altering, or performing preventive maintenance, shall do that work in such a manner and use materials of such a quality, that the condition of the aircraft, airframe, aircraft engine, propeller, or appliance worked on will be at least equal to its original or properly altered condition (with regard to aerodynamic function, structural strength, resistance to vibration and deterioration, and other qualities affecting airworthiness).	<b>0</b>	

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Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
6.a.(3)	Assess compliance with legal, regulatory and statutory requirements applicable to the SMS; and	§145.211 Quality control system	(a) A certificated repair station must establish and maintain a quality control system acceptable to the FAA that ensures the airworthiness of the articles on which the repair station or any of its contractors performs maintenance, preventive maintenance, or alterations.	1	The infrastructure in provided; the specific aviation safety requirement is not.
6.a.(4)	Assess conformity with organizational safety policies and procedures.	§145.219 Recordkeeping §145.211 Quality control system	(a) A certificated repair station must retain records in English that demonstrate compliance with the requirements of part 43. The records must be retained in a format acceptable to the FAA. (b) Repair station personnel must follow the quality control system when performing maintenance, preventive maintenance, or alterations under the repair station certificate and operations specifications. (c) A certificated repair station must retain records in English that demonstrate compliance with the requirements of part 43. The records must be retained in a format acceptable to the FAA.	1	The infrastructure in provided; the specific aviation safety requirement is not.
6.b.	<b>Information Acquisition.</b>				
6.b.(1)	The organization must collect the data/information necessary to demonstrate the effectiveness of the SMS.	§145.211 Quality control system	(c) A certificated repair station must prepare and keep current a quality control manual in a format acceptable to the FAA that includes the following: (1) A description of the system and procedures used for— (i) Taking corrective action on deficiencies;	1	The infrastructure in provided; the specific aviation safety requirement is not.
6.b.(2)	The organization must monitor operational data/information.	§145.219 Recordkeeping	(a) A certificated repair station must retain records in English that demonstrate compliance with the requirements of part 43. The records must be retained in a format acceptable to the FAA.	0	Maintenance is required to collect vast amounts of data; however, there is no requirement to monitor that data.
6.b.(3)	The organization must monitor products and services received from contractors.	§145.211 Quality control system	(a) A certificated repair station must retain records in English that demonstrate compliance with the requirements of part 43. The records must be retained in a format acceptable to the FAA. (b) Repair station personnel must follow the quality control system when performing maintenance, preventive maintenance, or alterations under the repair station certificate and operations specifications. (c) A certificated repair station must prepare and keep current a quality control manual in a format acceptable to the FAA that includes the following: (1) A description of the system and procedures used for— (i) Inspecting incoming raw materials to ensure acceptable quality;	2	
		§145.201 Privileges and limitations of certificate	(a) A certificated repair station may— (2) Arrange for another person to perform the maintenance, preventive maintenance, or alterations of any article for which the certificated repair station is rated. If that person is not certificated under part 145, the certificated repair station must ensure that the noncertificated person follows a quality control system equivalent to the system followed by the certificated repair station. (c) A certificated repair station may not approve for return to service' (1) Any article unless the maintenance, preventive maintenance, or alteration was performed in accordance with the applicable approved technical data or data acceptable to the FAA.		

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Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
		<p>§ 145.217 Contract maintenance</p>	<p>(a) A certificated repair station may contract a maintenance function pertaining to an article to an outside source provided—</p> <p>(1) The FAA approves the maintenance function to be contracted to the outside source; and</p> <p>(2) The repair station maintains and makes available to its certificate holding district office, in a format acceptable to the FAA, the following information:</p> <p>(i) The maintenance functions contracted to each outside facility; and</p> <p>(ii) The name of each outside facility to whom the repair station contracts maintenance functions and the type of certificate and ratings, if any, held by each facility.</p> <p>(b) A certificated repair station may contract a maintenance function pertaining to an article to a noncertificated person provided—</p> <p>(1) The noncertificated person follows a quality control system equivalent to the system followed by the certificated repair station;</p> <p>(2) The certificated repair station remains directly in charge of the work performed by the noncertificated person; and</p> <p>(3) The certificated repair station verifies, by test and/or inspection, that the work has been performed satisfactorily by the noncertificated person and that the article is airworthy before approving it for return to service.</p> <p>(c) A certificated repair station may not provide only approval for return to service of a complete type-certificated product following contract maintenance, preventive maintenance, or alterations.</p>	1	
6.c.	<p><b>Employee Reporting System</b></p> <p>The organization must establish and maintain an employee reporting system in which employees can report hazards, issues, concerns, occurrences, occurrences, incidents, etc., as well as propose solutions/safety improvements.</p>	<p>§145.221 Service difficulty reports</p> <p>§145.211 Quality control system</p> <p>§ 121.703 Service difficulty reports</p> <p>§ 135.415 Service difficulty reports</p> <p>AC 120-66B Aviation Safety Action Program</p>	<p>(a) A certificated repair station must report to the FAA within 96 hours after it discovers any serious failure, malfunction, or defect of an article. The report must be in a format acceptable to the FAA.</p> <p>(c) A certificated repair station must prepare and keep current a quality control manual in a format acceptable to the FAA that includes the following:</p> <p>(1) A description of the system and procedures used for—</p> <p>(i) Taking corrective action on deficiencies;</p> <p>(a) Each certificate holder shall report the occurrence or detection of each failure, malfunction, or defect concerning—</p> <p>(a) Each certificate holder shall report the occurrence or detection of each failure, malfunction, or defect in an aircraft concerning—</p> <p>1. PURPOSE: This Advisory Circular (AC) provides guidance for establishing an air transportation Aviation Safety Action Program (ASAP). The objective of the ASAP is to encourage air carrier and repair station employees to voluntarily report safety information that may be critical to identifying potential precursors to accidents. The Federal Aviation Administration (FAA) has determined that identifying these precursors is essential to further reducing the already low accident rate. Under an ASAP, safety issues are resolved through corrective action rather than through punishment or discipline.</p> <p>b. An ASAP provides a vehicle whereby employees of participating air carriers and repair station certificate holders can identify and report safety issues to management and to the FAA for resolution, without fear that the FAA will use reports accepted under the program to take legal enforcement action against them, or that companies will use such information to take disciplinary action.</p>	1	<p>The infrastructure is provided to report product safety concerns. There is no method to report process concerns or proposed solutions.</p>
6.c.(2)	<p>Employees must be encouraged to use the employee reporting system without reprisal.</p> <p>FN6 - This does not restrict management from taking action in cases of gross negligence or willful operation outside the organization's safety requirements.</p>	<p>AC 120-66B Aviation Safety Action Program</p>	<p>1. PURPOSE: This Advisory Circular (AC) provides guidance for establishing an air transportation Aviation Safety Action Program (ASAP). The objective of the ASAP is to encourage air carrier and repair station employees to voluntarily report safety information that may be critical to identifying potential precursors to accidents. The Federal Aviation Administration (FAA) has determined that identifying these precursors is essential to further reducing the already low accident rate. Under an ASAP, safety issues are resolved through corrective action rather than through punishment or discipline.</p> <p>b. An ASAP provides a vehicle whereby employees of participating air carriers and repair station certificate holders can identify and report safety issues to management and to the FAA for resolution, without fear that the FAA will use reports accepted under the program to take legal enforcement action against them, or that companies will use such information to take disciplinary action.</p>	0	

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6.d.	Investigation. FN7 - It is understood that not all organizations have the ability to directly investigate accidents and incidents for relevance to the products/services (e.g., organizations that provide air traffic management systems or subsystems). Therefore, in this case the organization should use the results of investigation conducted by other entities.			N/A	
6.d.(1)	The organization must establish criteria for which accidents and incidents will be investigated.		In both federal law and in Order VS 8000.367, accidents and incidents pertain to aircraft flight operation only, not to maintenance, or administrative, operations. [see 4.h.(1), above]	N/A	See 4.h.(1). The same responses apply.
6.d.(2)	The organization must establish procedures to: investigate accidents;				
6.d.(2)(a)	investigate incidents; and				
6.d.(2)(b)	investigate instances of suspected non-compliance with safety regulations.				
6.d.(2)(c)			(c) A certificated repair station must prepare and keep current a quality control manual in a format acceptable to the FAA that includes the following: (1) A description of the system and procedures used for— (x) Taking corrective action on deficiencies;		
6.e.	<b>Auditing of the Production/Operational System</b>			1	
6.e.(1)	The organization must ensure that regular audits of production/operational system's safety functions are conducted with priority on the areas of highest safety risk. This obligation must extend to any contractors the organization may use to accomplish those functions.  FN8 - The organization can choose to conduct audits of its contractors or require that contractors conduct their own audits and provide the resultant data/information to the organization.		<b>Safety risk</b> [The composite of predicted severity and likelihood of the potential effect of a hazard. (ref. Order VS 8000.367, Appendix A: Definitions)] is <b>NOT</b> an element of continuing <b>airworthiness</b> / maintenance. Airworthiness Standards, including Parts 23, 25, and 33, contain quantitative design requirements to ensure safe flight and landing in the event that any failure condition occurs. Those requirements are contained in a products type certificate, an element of airworthiness. The <b>Instructions for Continued Airworthiness</b> [also part of the type certificate, and required by §21.50(b)], through the elaborate Maintenance Review Board process (for transport category aircraft) are developed to ensure realization of the inherent safety and reliability levels of the equipment (as designed, certificated, and manufactured); and to restore safety and reliability to their inherent levels when deterioration has occurred.	1	The infrastructure in provided; the specific aviation safety requirement is not.  Repair stations are audited by their Part 121 and 135 customers. The FAA performs audits of repair stations annual.  If the repair station is EASA accepted (approximately 25% are), there is an internal/external audit requirement.
		§145.213 Inspection of maintenance, preventive maintenance, or alterations	(a) A certificated repair station must inspect each article upon which it has performed maintenance, preventive maintenance, or alterations as described in paragraphs (b) and (c) of this section before approving that article for return to service. (b) A certificated repair station must certify on an article's maintenance release that the article is airworthy with respect to the maintenance, preventive maintenance, or alterations performed after— (1) The repair station performs work on the article; and (2) An inspector inspects the article on which the repair station has performed work and determines it to be airworthy with respect to the work performed.		
		§ 121.373 Continuing analysis and surveillance	(a) Each certificate holder shall establish and maintain a system for the continuing analysis and surveillance of the performance and effectiveness of its inspection program and the program covering other maintenance, preventive maintenance, and alterations and for the correction of any deficiency in those programs, regardless of whether those programs are carried out by the certificate holder or by another person.		
		§ 135.431 Continuing analysis and surveillance	(a) Each certificate holder shall establish and maintain a system for the continuing analysis and surveillance of the performance and effectiveness of its inspection program and the program covering other maintenance, preventive maintenance, and alterations and for the correction of any deficiency in those programs, regardless of whether those programs are carried out by the certificate holder or by another person		
		§ 145.217 Contract maintenance	(b) A certificated repair station may contract a maintenance function pertaining to an article to a noncertificated person provided— (1) The noncertificated person follows a quality control system equivalent to the system followed by the certificated repair station		

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## Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR

Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
		EASA 145.A.65 Safety and quality policy, maintenance procedures and quality system	(c) The organisation shall establish a quality system that includes the following: 1. Independent audits in order to monitor compliance with required aircraft/aircraft component standards and adequacy of the procedures to ensure that such procedures invoke good maintenance practices and airworthy aircraft/aircraft components. In the smallest organisations the independent audit part of the quality system may be contracted to another organisation approved under this Part or a person with appropriate technical knowledge and proven satisfactory audit experience; and		
6.e.(2)	The organization must ensure regular audits are conducted to:			1	
6.e.(2)(a)	determine conformity with safety risk controls; and <b>[Safety risk control – A characteristic of a system that reduces safety risk. Controls may include process design, equipment modification, work procedures, training or protective device. (ref. Appendix A: Definitions, Order VS 8000.367)]</b>	Safety risk [The composite of predicted severity and likelihood of the potential effect of a hazard. (ref. Order VS 8000.367, Appendix A: Definitions)] is <b>NOT</b> an element of continuing airworthiness / maintenance. Airworthiness Standards, including Parts 23, 25, and 33, contain quantitative design requirements to ensure safe flight and landing in the event that any failure condition occurs. Those requirements are contained in a product's type certificate, an element of airworthiness. The Instructions for Continued Airworthiness [also part of the type certificate, and required by §21.50(b)], through the elaborate Maintenance Review Board process (for transport category aircraft) are developed to ensure realization of the inherent safety and reliability levels of the equipment (as designed, certificated, and manufactured); and to restore safety and reliability to their inherent levels when deterioration has occurred.	1	See 6.e.(1) response.	
6.e.(2)(b)	assess performance of safety risk controls.			1	See 6.e.(1) response.
6.e.(3)	Auditing may be done at planned intervals or as a continuing process.		Rather than conduct audits per se, a continuous process of determining the <b>airworthiness</b> of work performed is required in accordance with §145.213: (a) A certificated repair station must inspect each article upon which it has performed maintenance, preventive maintenance, or alterations as described in paragraphs (b) and (c) of this section before approving that article for return to service. (b) A certificated repair station must certify on an article's maintenance release that the article is <b>airworthy</b> with respect to the maintenance, preventive maintenance, or alterations performed after— (1) The repair station performs work on the article; and (2) An inspector inspects the article on which the repair station has performed work and determines it to be <b>airworthy</b> with	1	See 6.e.(1) response. See 6.e.(1) response.
6.f.	<b>Evaluation of the SMS.</b> <b>[Safety Management System (SMS) – The formal, top-down business-like approach to managing safety risk. It includes systematic procedures, practices, and policies for the management of safety (as described in this document it includes Safety Risk Management, safety policy, safety assurance, and safety promotion). (ref. Appendix A: Definitions, Order VS 8000.367)]</b>			0	Without the requirement for an SMS there is no system to evaluate. Previous comments identify that infrastructure for elements are in place.
6.f.(1)	The organization must conduct evaluations of the SMS to determine if the SMS conforms to requirements.			0	
6.f.(2)	Evaluations may be done at planned intervals or as a continuing process.			0	
6.g.	<b>Audits by Oversight Organization.</b> If applicable, the organization must include the results of oversight organization audits in the data/information analyses conducted as described in Section h.	§145.223 FAA inspections	(a) A certificated repair station must allow the FAA to inspect that repair station at any time to determine compliance with this chapter. (b) A certificated repair station may not contract for the performance of a maintenance function on an article with a noncertificated person unless it provides in its contract with the noncertificated person that the FAA may make an inspection and observe the performance of the noncertificated person's work on the article. (c) A certificated repair station may not return to service any article on which a maintenance function was performed by a noncertificated person if the noncertificated person does not permit the FAA to make the inspection described in paragraph (b) of this section.	1	The infrastructure in provided; the specific aviation safety requirement is not.
6.h.	<b>Analysis of Data/Information.</b> The organization must analyze the data/information described in Section b.	§145.211 Quality control system	(c) A certificated repair station must prepare and keep current a quality control manual in a format acceptable to the FAA that includes the following: (1) A description of the system and procedures used for— (ix) Taking corrective action on deficiencies;	1	The infrastructure in provided; the specific aviation safety requirement is not.

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## Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR

Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
		\$145.219 Recordkeeping	(a) A certificated repair station must retain records in English that demonstrate compliance with the requirements of part 43. The records must be retained in a format acceptable to the FAA.		
		\$145.211 Quality control system	(a) A certificated repair station must establish and maintain a quality control system acceptable to the FAA that ensures the airworthiness of the articles on which the repair station or any of its contractors performs maintenance, preventive maintenance, or alterations. (b) Repair station personnel must follow the quality control system when performing maintenance, preventive maintenance, or alterations under the repair station certificate and operations specifications. (c) A certificated repair station must prepare and keep current a quality control manual in a format acceptable to the FAA that includes the following: (1) A description of the system and procedures used for— (i) Inspecting incoming raw materials to ensure acceptable quality;		
<b>6.i.</b>	<b>System Assessment.</b>			1	
6.i.(1)	The organization must assess the performance of:				
6.i.(1)(a)	the production/operational system's safety functions against its safety requirements as defined by the SMS and			0	Without the requirement for an SMS there is no system to evaluate. Previous comments identify that infrastructure for elements are in place.
6.i.(1)(b)	the SMS against its requirements.			0	
6.i.(2)	System assessments must result in the documentation of:	AC 145-9		1	
6.i.(2)(a)	conformity with existing safety risk control(s)/SMS requirement(s) (including legal, regulatory and statutory requirements applicable to the SMS);	\$145.219 Recordkeeping	(a) A certificated repair station must retain records in English that demonstrate compliance with the requirements of part 43. The records must be retained in a format acceptable to the FAA.	1	The infrastructure in provided; the specific aviation safety requirement is not.
6.i.(2)(b)	nonconformity with existing safety risk control(s)/SMS requirement(s) (including legal, regulatory and statutory requirements applicable to the SMS);	\$145.211 Quality control system	(a) A certificated repair station must establish and maintain a quality control system acceptable to the FAA that ensures the airworthiness of the articles on which the repair station or any of its contractors performs maintenance, preventive maintenance, or alterations.	1	The infrastructure in provided; the specific aviation safety requirement is not.
6.i.(2)(c)	potential ineffective control(s); and	\$145.211 Quality control system	(c) A certificated repair station must prepare and keep current a quality control manual in a format acceptable to the FAA that includes the following: (1) A description of the system and procedures used for— (i) Taking corrective action on deficiencies;	1	The infrastructure in provided; the specific aviation safety requirement is not.
6.i.(2)(d)	potential hazard(s) found.	\$145.221 Service difficulty reports	(a) A certificated repair station must report to the FAA within 96 hours after it discovers any serious failure, malfunction, or defect of an article. The report must be in a format acceptable to the FAA.	1	The infrastructure in provided; the specific aviation safety requirement is not.
6.i.(3)	The SRM process must be utilized if the assessment identifies:			0	
6.i.(3)(a)	potential hazards or	\$145.221 Service difficulty reports	(a) A certificated repair station must report to the FAA within 96 hours after it discovers any serious failure, malfunction, or defect of an article. The report must be in a format acceptable to the FAA.	0	
6.i.(3)(b)	the need for production/operational system changes.	\$145.211 Quality control system	(c) A certificated repair station must prepare and keep current a quality control manual in a format acceptable to the FAA that includes the following: (1) A description of the system and procedures used for— (i) Taking corrective action on deficiencies;	0	
<b>6.j.</b>	<b>Corrective Action.</b>	\$145.211 Quality control system	(c) A certificated repair station must prepare and keep current a quality control manual in a format acceptable to the FAA that includes the following: (1) A description of the system and procedures used for— (i) Taking corrective action on deficiencies;	2	
	When nonconformities are identified, the organization must prioritize and implement corrective actions.				
<b>6.k.</b>	<b>Management Reviews.</b>			0	
6.k.(1)	Top management must conduct regular reviews of SMS effectiveness.			0	There are requirements to collect the data; there is no requirement for management review.

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# Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR

Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
6.k.(2)	Management reviews must assess the need for changes to the SMS.	\$145.211 Quality control system	(c) A certified repair station must prepare and keep current a quality control manual in a format acceptable to the FAA that includes the following: (1) A description of the system and procedures used for— (ix) Taking corrective action on deficiencies;	0	
7	<b>Safety Promotion.</b> [ref Chapter 6 of the Order]			1	
7.a.	<b>Safety Culture.</b> Top management must promote the growth of a positive safety culture demonstrated by, but not limited to:			1	
7.a.(1)	publication to all employees of senior management's stated commitment to safety;	\$145.3 Definition of terms	For the purposes of this part, the following definitions apply: (a) <b>Accountable manager</b> means the person designated by the certificated repair station who is responsible for and has the authority over all repair station operations that are conducted under part 145, including ensuring that repair station personnel follow the regulations and serving as the primary contact with the FAA. A007 Designated Persons. FAA Accountable Manager. 145 (The name of the accountable manager is inserted here by the FAA prior to issue of the certificate)	1	
		FAA Form 8000-4 Air Agency Certificate Operations Specifications	(a) No person may operate as a certificated repair station without, or in violation of, a repair station certificate, ratings, or operations specifications issued under this part. (b) The certificate and operations specifications issued to a certificated repair station must be available on the premises for inspection by the public and the FAA. (a) A certificated repair station must have an employee training program approved by the FAA that consists of initial and recurrent training. 301. INDOCTRINATION (INITIAL AND RECURRENT) TRAINING. b. The following subjects should be addressed in the training program, regardless of the repair station's size or ratings: (2) Company manuals, policies, procedures, and practices, including quality control processes, particularly those associated with ensuring compliance with maintenance (including inspection), preventive maintenance, and alteration procedures established to show compliance with 14 CFR part 145. (b) The training program must ensure each employee assigned to perform maintenance, preventive maintenance, or alterations, and inspection functions is capable of performing the assigned task.	2	
7.a.(2)	communication of safety responsibilities with the organization's personnel to make each employee part of the safety process;	\$145.163 Training requirements		1	
7.a.(3)	clear and regular communications of safety policy, goals, objectives, standards and performance to all employees of the organization;	FAA AC 145-10		1	
7.a.(4)	an effective employee reporting system that provides confidentiality and de-identification as appropriate (as described in Chapter 6, Section c);	AC 120-66B Aviation Safety Action Program (ASAP)	5. APPLICABILITY. ASAPs are intended for air carriers that operate under Part 121. They are also intended for major domestic repair stations certificated under Part 145. ASAPs are entered into voluntarily by the FAA, a certificate holder, and if appropriate, other parties. k. Major Domestic Repair Station. Refers to a Part 145 certificated repair station located in the United States that is certificated to perform airframe and/or engine maintenance for certificate holders operating under Part 121. This part describes when and how the FAA protects from disclosure safety and security information that you submit voluntarily to the FAA. This part carries out 49 U.S.C. 40123, protection of voluntarily submitted information. The FAA discloses information that is designated as protected under this part when withholding it would not be consistent with the FAA's safety and security responsibilities, as follows: (a) Disclosure in all programs. (1) The FAA may disclose de-identified, summarized information submitted under this part to explain the need for changes in policies and regulations. An example is the FAA publishing a notice of proposed rulemaking based on your information, and including a de-identified, summarized version of your information (and the information from other persons, if applicable) to explain the need for the notice of proposed rulemaking.	1	

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## Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR

Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
7.a.(5)	use of a safety information system that provides accessible, efficient means to retrieve information; and	<p>§145.101 General</p> <p>§ 145.209 Repair station manual contents</p> <p>§ 145.219 Recordkeeping</p>	<p>A certificated repair station must provide housing, facilities, equipment, materials, and data that meet the applicable requirements for the issuance of the certificate and ratings the repair station holds.</p> <p>(f) A description of the required records and the recordkeeping system used to obtain, store, and retrieve the required records</p> <p>(a) A certificated repair station must retain records in English that demonstrate compliance with the requirements of part 43. The records must be retained in a format acceptable to the FAA.</p> <p>(b) A certificated repair station must provide a copy of the maintenance release to the owner or operator of the article on which the maintenance, preventive maintenance, or alteration was performed.</p> <p>(c) A certificated repair station must retain the records required by this section for at least 2 years from the date the article was approved for return to service.</p> <p>(d) A certificated repair station must make all required records available for inspection by the FAA and the National Transportation Safety Board.</p>	1	
7.a.(6)	allocation of resources to implement and maintain the SMS.	Part 145	<p>Subpart C - Housing, Facilities, Equipment, Materials, and Data</p> <p>Subpart D - Personnel</p> <p>Subpart E - Operating Rules</p>	2	
7.b.	<b>Communication and Awareness.</b>			1	
7.b.(1)	The organization must communicate SMS outputs to employees as appropriate.  [SMS Output - The result or product of an SMS process. In this context, the result of a process, which is intended to meet a requirement described in this Standard (e.g., results of safety risk analyses, safety audits, and safety investigations) Order VS 8000.367, Appendix A: Definitions]			0	One appropriate place to add this requirement would be the training program under §145.163. Currently there is no closed loop requirement.
7.b.(2)	If applicable, the organization must provide access to the SMS outputs to its oversight organization, in accordance with established agreements and disclosure programs.	<p>§21.3 Reporting of Failures, Malfunctions, and Defects</p> <p>§145.221 Service difficulty reports</p> <p>§145.223 FAA inspections</p>	<p>(a) Except as provided in paragraph (d) of this section, the holder of a Type Certificate (including a Supplemental Type Certificate), a Parts Manufacturer Approval (PMA), or a TSO authorization, or the licensee of a Type Certificate shall report any failure, malfunction, or defect in any product, part, process, or article manufactured by it that it determines has resulted in any of the occurrences listed in paragraph (c) of this section.</p> <p>(b) The holder of a Type Certificate (including a Supplemental Type Certificate), a Parts Manufacturer Approval (PMA), or a TSO authorization, or the licensee of a Type of Certificate shall report any defect in any product, part, or article manufactured by it that has left its quality control system and that it determines could result in any of the occurrences listed in paragraph (c) of this section.</p> <p>(a) A certificated repair station must report to the FAA within 96 hours after it discovers any serious failure, malfunction, or defect of an article. The report must be in a format acceptable to the FAA.</p> <p>(a) A certificated repair station must allow the FAA to inspect that repair station at any time to determine compliance with this chapter.</p> <p>(b) A certificated repair station may not contract for the performance of a maintenance function on an article with a noncertificated person unless it provides in its contract with the noncertificated person that the FAA may make an inspection and observe the performance of the noncertificated person's work on the article.</p> <p>(c) A certificated repair station may not return to service any article on which a maintenance function was performed by a noncertificated person if the noncertificated person does not permit the FAA to make the inspection described in paragraph (b) of this section.</p>	2	The infrastructure in provided; the specific SMS output requirement is not.  Under §145.219 the repair station must provide access to all records to the FAA, the primary oversight organization.  SMS should be available record, not a required record. It must be protected from FOIA.

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## Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR

Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
7.b.(3)	The organization must ensure that affected employees and external stakeholders (including its oversight organization, if applicable) are aware of the short-term safety risk of hazards that may exist in the production/operational system while safety risk control/mitigation plans are developed and implemented (as described in Chapter 5, Section d 3).	<p>AC No.: 00-58B Voluntary Disclosure Reporting Program</p> <p>§ 145.219 Recordkeeping</p> <p>Safety risk [The composite of predicted severity and likelihood of the potential effect of a hazard. (ref. Order VS 8000.367, Appendix A: Definitions)] is <b>NOT</b> an element of continuing airworthiness / maintenance. Airworthiness Standards, including Parts 23, 25, and 33, contain quantitative design requirements to ensure safe flight and landing in the event that any failure condition occurs. Those requirements are contained in a product's type certificate, an element of airworthiness. The instructions for Continued Airworthiness (also part of the type certificate, and required by §21.50(b)), through the elaborate Maintenance Review Board process (for transport category aircraft) are developed to ensure realization of the inherent safety and reliability levels of the equipment (as designed, certificated, and manufactured); and to restore safety and reliability to their inherent levels when deterioration has occurred.</p>	<p>1. PURPOSE: This advisory circular (AC) provides information and guidance material that may be used by a certificate holder, qualified fractional ownership programs (as defined in paragraph 4e), or a Production Approval Holder (PAH) operating under Title 14 of the Code of Federal Regulations (14 CFR) when voluntarily disclosing to the Federal Aviation Administration (FAA) apparent violations of those FAA regulations listed in paragraph 3. The procedures and practices outlined in this AC can be applied to the maintenance, flight operations, anti-drug and alcohol misuse prevention programs, and to the manufacturing functions of the PAH's organization. The procedures and practices outlined in this AC cannot be applied to those persons who are required to report failures, malfunctions, and defects under 14 CFR part 21, § 21.3 and who do not make those reports in the timeframe required by the regulations.</p> <p>(d) A certificated repair station must make all required records available for inspection by the FAA and the National Transportation Safety Board.</p>	1	The oversight organization in certainly engaged. There are numerous communication systems used in maintenance; however, there is no regulatory requirement for awareness communication.
7.c.	<b>Personnel Competency.</b>	<p><b>NOTE:</b> The term <i>Aviation Safety Position</i> is <b>not defined</b> in Order VS 8000.367, nor in any of the FAA literature. The term is also <b>not defined</b> in the ICAO Safety Management Manual, Doc 9859. The assumption made in cross referencing Order VS 8000.367 to the FARs and related was that anyone performing maintenance, and any management position with influence over anyone performing maintenance, would be considered an Aviation Safety Position.</p>		1	
7.c.(1)	The organization must document competency requirements for those positions identified in (Appendix B) Chapter 4, Section e 4. (Aviation Safety Positions)	<p>§43.3 Persons authorized to perform maintenance, preventive maintenance, rebuilding, and alterations</p>	<p>(a) Except as provided in this section and §43.17 (certain Canadian persons), no person may maintain, rebuild, alter, or perform preventive maintenance on an aircraft, airframe, aircraft engine, propeller, appliance, or component part to which this part applies. Those items, the performance of which is a major alteration, a major repair, or preventive maintenance, are listed in appendix A.</p> <p>(b) The holder of a mechanic certificate may perform maintenance, preventive maintenance, and alterations as provided in Part 65 of this chapter.</p> <p>(c) The holder of a repairman certificate may perform maintenance, preventive maintenance, and alterations as provided in part 65 of this chapter.</p> <p>(d) A person working under the supervision of a holder of a mechanic or repairman certificate may perform the maintenance, preventive maintenance, and alterations that his supervisor is authorized to perform, if the supervisor personally observes the work being done to the extent necessary to ensure that it is being done properly and if the supervisor is readily available, in person, for consultation. However, this paragraph does not authorize the performance of any inspection required by Part 91 or Part 125 of this chapter or any inspection performed after a major repair or alteration.</p> <p>(e) The holder of a repair station certificate may perform maintenance, preventive maintenance, and alterations as provided in Part 145 of this chapter.</p> <p>(f) The holder of an air carrier operating certificate or an operating certificate issued under Part 121 or 135, may perform maintenance, preventive maintenance, and alterations as provided in Part 121 or 135.</p> <p>(g) Accountable manager means the person designated by the certificated repair station who is responsible for and has the authority over all repair station operations that are conducted under part 145, including ensuring that repair station personnel follow the regulations and serving as the primary contact with the FAA.</p>	1	Because the ASP is not required it is not currently addressed. If the ASP was required it would have to be addressed.

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# Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR

Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
		<p>§145.153 Supervisory personnel requirements</p> <p>(b) Each supervisor must—</p> <p>(1) If employed by a repair station located inside the United States, be certificated under part 65.</p> <p>(2) If employed by a repair station located outside the United States—</p> <p>(i) Be trained in or thoroughly familiar with the methods, techniques, practices, aids, equipment, and tools used to perform the maintenance, preventive maintenance, or alterations.</p>			
		<p>§145.155 Inspection personnel requirements</p> <p>(a) A certificated repair station must ensure that persons performing inspections under the repair station certificate and operations specifications are—</p> <p>(1) Thoroughly familiar with the applicable regulations in this chapter and with the inspection methods, techniques, practices, aids, equipment, and tools used to determine the airworthiness of the article on which maintenance, preventive maintenance, or alterations are being performed; and</p> <p>(2) Proficient in using the various types of inspection equipment and visual inspection aids appropriate for the article being inspected; and</p> <p>(b) A certificated repair station must ensure its inspectors understand, read, and write English.</p>			
		<p>§145.157 Personnel authorized to approve an article for return to service</p> <p>(a) A certificated repair station located inside the United States must ensure each person authorized to approve an article for return to service under the repair station certificate and operations specifications is certificated under part 65.</p> <p>(b) A certificated repair station located outside the United States must ensure each person authorized to approve an article for return to service under the repair station certificate and operations specifications is—</p> <p>(1) Trained in or has 18 months practical experience with the methods, techniques, practices, aids, equipment, and tools used to perform the maintenance, preventive maintenance, or alterations; and</p> <p>(2) Thoroughly familiar with the applicable regulations in this chapter and proficient in the use of the various inspection methods, techniques, practices, aids, equipment, and tools appropriate for the work being performed and approved for return to service.</p> <p>(c) A certificated repair station must ensure each person authorized to approve an article for return to service understands, reads, and writes English.</p>			
		<p>§145.163 Training requirements</p> <p>(a) A certificated repair station must have an employee training program approved by the FAA that consists of initial and recurrent training. For purposes of meeting the requirements of this paragraph, beginning April 6, 2006—</p> <p>(1) An applicant for a repair station certificate must submit a training program for approval by the FAA as required by §145.51(a)(7).</p> <p>(2) A repair station certificated before that date must submit its training program to the FAA for approval by the last day of the month in which its repair station certificate was issued.</p> <p>(b) The training program must ensure each employee assigned to perform maintenance, preventive maintenance, or alterations, and inspection functions is capable of performing the assigned task.</p> <p>(c) A certificated repair station must document, in a format acceptable to the FAA, the individual employee training required under paragraph (a) of this section. These training records must be retained for a minimum of 2 years.</p> <p>(d) A certificated repair station must submit revisions to its training program to its certificate holding district office in accordance with the procedures required by §145.209(e).</p>			

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Order 8000.367 Appendix B 7.c.(2)	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
The organization must ensure that individuals in the positions identified in (Appendix B) Chapter 4, Section e 4 meet the documented competency requirements.		§145.151 Personnel requirements	<p>Each certificated repair station must—</p> <p>(a) Designate a repair station employee as the accountable manager;</p> <p>(b) Provide qualified personnel to plan, supervise, perform, and approve for return to service the maintenance, preventive maintenance, or alterations performed under the repair station certificate and operations specifications;</p> <p>(c) Ensure it has a sufficient number of employees with the training or knowledge and experience in the performance of maintenance, preventive maintenance, or alterations authorized by the repair station certificate and operations specifications to ensure all work is performed in accordance with part 43; and</p> <p>(d) Determine the abilities of its noncertificated employees performing maintenance functions based on training, knowledge, experience, or practical tests.</p>	1	Because the Aviation Safety Position (ASP) is not required it is not currently addressed. If the ASP was required, it would have to be addressed.
		§145.153 Supervisory personnel requirements	<p>(a) A certificated repair station must ensure it has a sufficient number of supervisors to direct the work performed under the repair station certificate and operations specifications. The supervisors must oversee the work performed by any individuals who are unfamiliar with the methods, techniques, practices, aids, equipment, and tools used to perform the maintenance, preventive maintenance, or alterations—</p> <p>(b) Each supervisor must—</p> <p>(1) If employed by a repair station located inside the United States, be certificated under part 65,</p> <p>(2) If employed by a repair station located outside the United States—</p> <p>(i) Have a minimum of 18 months of practical experience in the work being performed; or</p> <p>(ii) Be trained in or thoroughly familiar with the methods, techniques, practices, aids, equipment, and tools used to perform the maintenance, preventive maintenance, or alterations.</p> <p>(c) A certificated repair station must ensure its supervisors understand, read, and write English.</p>		
		§145.155 Inspection personnel requirements	<p>(a) A certificated repair station must ensure that persons performing inspections under the repair station certificate and operations specifications are—</p> <p>(1) Thoroughly familiar with the applicable regulations in this chapter and with the inspection methods, techniques, practices, aids, equipment, and tools used to determine the airworthiness of the article on which maintenance, preventive maintenance, or alterations are being performed; and</p> <p>(2) Proficient in using the various types of inspection equipment and visual inspection aids appropriate for the article being inspected; and</p> <p>(b) A certificated repair station must ensure its inspectors understand, read, and write English.</p>		
		§145.157 Personnel authorized to return an article to service	<p>(a) A certificated repair station located inside the United States must ensure each person authorized to approve an article for return to service under the repair station certificate and operations specifications is certificated under part 65.</p> <p>(b) A certificated repair station located outside the United States must ensure each person authorized to approve an article for return to service under the repair station certificate and operations specifications is—</p> <p>(1) Trained in or has 18 months practical experience with the methods, techniques, practices, aids, equipment, and tools used to perform the maintenance, preventive maintenance, or alterations; and</p> <p>(2) Thoroughly familiar with the applicable regulations in this chapter and proficient in the use of the various inspection methods, techniques, practices, aids, equipment, and tools appropriate for the work being performed and approved for return to service.</p> <p>(c) A certificated repair station must ensure each person authorized to approve an article for return to service understands, reads, and writes English.</p>		
		§145.159 Recommendation of a person for certification as a repairman	<p>A certificated repair station that chooses to use repairmen to meet the applicable personnel requirements of this part must certify in a format acceptable to the FAA that each person recommended for certification as a repairman—</p> <p>(a) Is employed by the repair station, and</p> <p>(b) Meets the eligibility requirements of §65.101.</p>		

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# Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR

Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
		<p>§145.163 Training requirements</p>	<p>(a) A certificated repair station must have an employee training program approved by the FAA that consists of initial and recurrent training. For purposes of meeting the requirements of this paragraph, beginning April 6, 2006—                      (1) An applicant for a repair station certificate must submit a training program for approval by the FAA as required by §145.51(a)(7).                      (2) A repair station certificated before that date must submit its training program to the FAA for approval by the last day of the month in which its repair station certificate was issued.                      (b) The training program must ensure each employee assigned to perform maintenance, preventive maintenance, or alterations, and inspection functions is capable of performing the assigned task.                      (c) A certificated repair station must document, in a format acceptable to the FAA, the individual employee training required under paragraph (a) of this section. These training records must be retained for a minimum of 2 years.                      (d) A certificated repair station must submit revisions to its training program to its certificate holding district office in accordance with the procedures required by §145.209(e).</p>		
		<p>§145.165 Hazardous materials training</p>	<p>(a) Each repair station that meets the definition of a hazmat employer under 49 CFR 171.8 must have a hazardous materials training program that meets the training requirements of 49 CFR part 172 subpart H.                      (b) A repair station employee may not perform or directly supervise a job function listed in §121.1001 or §135.501 for, or on behalf of the part 121 or 135 operator including loading of items for transport on an aircraft operated by a part 121 or part 135 certificate holder unless that person has received training in accordance with the part 121 or part 135 operator's FAA approved hazardous materials training program.</p>		
7.d.	<p><b>Safety Knowledge Management.</b>                      The SMS must include a process to capture knowledge of safety and incorporate it into future products, services and practices as appropriate.</p>	<p>§43.13 Performance rules (general)</p>	<p>(a) Each person performing maintenance, alteration, or preventive maintenance on an aircraft, engine, propeller, or appliance shall use the methods, techniques, and practices prescribed in the current manufacturer's maintenance manual or instructions for Continued Airworthiness prepared by its manufacturer, or other methods, techniques, and practices acceptable to the Administrator, except as noted in §43.16. He shall use the tools, equipment, and test apparatus necessary to assure completion of the work in accordance with accepted industry practices. If special equipment or test apparatus is recommended by the manufacturer involved, he must use that equipment or apparatus or its equivalent acceptable to the Administrator.                      (b) Each person maintaining or altering, or performing preventive maintenance, shall do that work in such a manner and use materials of such a quality, that the condition of the aircraft, airframe, aircraft engine, propeller, or appliance worked on will be at least equal to its original or properly altered condition (with regard to aerodynamic function, structural strength, resistance to vibration and deterioration, and other qualities affecting airworthiness).                      (c) Special provisions for holders of air carrier operating certificates and operating certificates issued under the provisions of Part 121 or 135 and Part 129 operators holding operations specifications. Unless otherwise notified by the administrator, the methods, techniques, and practices contained in the maintenance manual or the maintenance part of the manual of the holder of an air carrier operating certificate or an operating certificate under Part 121 or 135 and Part 129 operators holding operations specifications (that is required by its operating specifications to provide a continuous airworthiness maintenance and inspection program) constitute acceptable means of compliance with this section.</p>	2/1	<p>It is a 2 because maintenance certainly has a requirement to capture, report, and act upon information obtained during the course of maintenance.</p> <p>The system breaks down because there is no requirement for any follow-up by any outside organization. Resulting in a partial compliance rating (1).</p>
		<p>§145.163 Training requirements</p>	<p>(a) A certificated repair station must have an employee training program approved by the FAA that consists of initial and recurrent training.</p>		

Assessment Rating

0 = The element is not performed.

1 = The element is in place; however, it does not include all SMS processes.

2 = The element is in place and includes all SMS processes.

# Attachment A - Gap Analysis FAA Order VS 8000.367 Appendix B to 14 CFR

Order 8000.367 Appendix B	SUBJECT - TITLE	CFR and as indicated	SUBJECT - TITLE	Assessment Rating	Comments
		<p>\$145.201 Privileges and limitations of certificate</p>	<p>(a) A certificated repair station may—                      (1) Perform maintenance, preventive maintenance, or alterations in accordance with part 43 on any article for which it is rated and within the limitations in its operations specifications.                      (2) Arrange for another person to perform the maintenance, preventive maintenance, or alterations of any article for which the certificated repair station is rated. If that person is not certificated under part 145, the certificated repair station must ensure that the noncertificated person follows a quality control system equivalent to the system followed by the certificated repair station.                      (3) Approve for return to service any article for which it is rated after it has performed maintenance, preventive maintenance, or an alteration in accordance with part 43.                      (b) A certificated repair station may not maintain or alter any article for which it is not rated, and may not maintain or alter any article for which it is rated if it requires special technical data, equipment, or facilities that are not available to it.                      (c) A certificated repair station may not approve for return to service—                      (1) Any article unless the maintenance, preventive maintenance, or alteration was performed in accordance with the applicable approved technical data or data acceptable to the FAA.                      (2) Any article after a major repair or major alteration unless the major repair or major alteration was performed in accordance with applicable approved technical data; and                      (3) Any experimental aircraft after a major repair or major alteration performed under §43.1(b) unless the major repair or major alteration was performed in accordance with methods and applicable technical data acceptable to the FAA.</p>		
8	<p><b>Interoperability.</b> [ref. Chapter 7 of the Order]                      The organization's SMS must be able to interoperate with other organizations' SMSs to manage cooperatively issues of mutual concern.</p>	<p>\$ 145.221 Service difficulty reports</p> <p>\$145.205 Maintenance, preventive maintenance, and alterations performed for certificate holders under parts 121, 125, and 135, and for foreign air carriers or persons operating a U.S.-registered aircraft in common carriage under part 129.</p>	<p>(a) A certificated repair station must report to the FAA within 96 hours after it discovers any serious failure, malfunction, or defect of an article. The report must be in a format acceptable to the FAA.</p> <p>(a) A certificated repair station that performs maintenance, preventive maintenance, or alterations for an air carrier or commercial operator that has a continuous airworthiness maintenance program under part 121 or part 135 must follow the air carrier's or commercial operator's program and applicable sections of its maintenance manual.                      (b) A certificated repair station that performs inspections for a certificate holder conducting operations under part 125 must follow the operator's FAA-approved inspection program.                      (c) A certificated repair station that performs maintenance, preventive maintenance, or alterations for a foreign air carrier or foreign person operating a U.S.-registered aircraft under part 129 must follow the operator's FAA-approved maintenance program.                      (d) Notwithstanding the housing requirement of §145.103(b), the FAA may grant approval for a certificated repair station to perform line maintenance for an air carrier certificated under part 121 or part 135, or a foreign air carrier or foreign person operating a U.S.-registered aircraft in common carriage under part 129 on any aircraft of that air carrier or person, provided—                      (1) The certificated repair station performs such line maintenance in accordance with the operator's manual, if applicable, and approved maintenance program;                      (2) The certificated repair station has the necessary equipment, trained personnel, and technical data to perform such line maintenance; and                      (3) The certificated repair station's operations specifications include an authorization to perform line maintenance.</p>	1	<p>If there is an SMS requirement, the rule cannot force repair stations to comply with each air carrier's SMS system. Having repair stations meet multiple SMS systems in and of itself would be a hazard.</p> <p>A finding by any organization reported to another organization must be treated the same as if the finding was discovered and reported internally.</p>

### Assessment Rating

- 0 = The element is not performed.
- 1 = The element is in place; however, it does not include all SMS processes.
- 2 = The element is in place and includes all SMS processes.

**Attachment B – ANPRM Question Summaries**



## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	1. Please tell us about your organization, including what products/services are provided, what FAA certificates you hold, approximate number of employees, and your approximate annual gross revenue.	
<b>SUMMARY</b>	Maintenance responses were summarized from 11 maintenance organizations, 9 manufactures with maintenance facilities and 7 operators. Employment ranged from 1, 2 & 3 person facilities to facilities with over 3,500 people. Revenue ranged from \$200,000.00 per year to over \$60 billion per year. The summaries were prepared by the SMS ARC Maintenance Working Group in support of the group's recommendations to the ARC.	
<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>	
•		•
<b>TEAM DISPOSITION</b>		

## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	<p>2. Has your organization implemented an SMS or components of an SMS based on any of the guidance materials below? Please describe your implementation experience.</p> <ol style="list-style-type: none"> <li>a. FAA Order VS8000.367, AVSSMS Requirements, Appendix B.</li> <li>b. AC-120-92, Introduction to safety Management System for Air operators.</li> <li>c. FAA-sponsored regulatory or voluntary programs. (CASS, EIP, ASAP, etc.)</li> <li>d. Foreign civil aviation authorities' SMS development material. (Transport Canada, CAAS, CASA, CAA, etc.)</li> </ol>	
<b>SUMMARY</b>	<p><i>Few comments actually addressed the question as written; most commented on their concerns about SMS. The implementation of an SMS or any components of an SMS have normally been adopted by larger, more financially sound organizations. There have been several success stories with businesses that have stations in overseas locations. They have been able to build on the experience and knowledge that has come about with the SMS requirement in other countries. There is a major concern with the smaller businesses due to the impact of how the rule will be implemented and enforced at all levels.</i></p>	
	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
	<ul style="list-style-type: none"> <li>• Most respondents recognized and acknowledged the value of an SMS system.</li> <li>• Many larger corporations have previously established other types of Quality Management Systems. (AS9100, ISO 14001, etc.), which should make the transition to an SMS smoother.</li> <li>• A few companies already have an SMS system in place in foreign countries due to being an international entity.</li> <li>• Several companies are utilizing ICAO document 9859, Second Edition-2009, to use as a guidance tool.</li> <li>• A majority of the larger airlines have established the groundwork for an SMS based upon the referenced guidance material.</li> </ul>	<ul style="list-style-type: none"> <li>• Most guidance materials for SMS are tailored toward the aircraft operator and less toward maintenance service providers.</li> <li>• With the establishment and requirement of other Quality systems, the cost of recertification and redundant audits is voiced.</li> <li>• There has been considerable divergence in the interpretation of SMS requirements at the national level, as compared to other countries that have an SMS in place (Japan, UK, and Korea). Due to these differences, other authorities that have postponed implementation of SMS until details can be resolved.</li> <li>• For PMA holders, a Continued Operational Safety (COS) was implemented in June 2008. Due to FAA budget constraint, COS was never fully developed. Will SMS go the way of COS?</li> <li>• Under current FAA regulations, an RSM, QCM and a Training Manual are used to conduct repair station business. These manuals have been approved and/or accepted by the FAA. For the smaller shops, a required SMS would put unnecessary and excessive financial burdens on them, meaning an increase of customer costs and the possibility of lost business or loss of the business itself.</li> <li>• Some experience with the FAA has shown potential issues with the certificate holder FSDO and the FAA SMS administrator on interpretations and expectations for SMS deployment. This has led to conflicting and shifting of direction with respect to implementation.</li> </ul>
<b>TEAM DISPOSITION</b>	<p><i>As the responses to this question were very limited or addressed what SMS might be, a meaningful disposition on the exact question is not conclusive. The referenced guidance material has been utilized for the implementation of several SMS functions. ICAO document 9859 has also been used as a guidance tool. Several organizations have had to implement an SMS due to facilities being located overseas. The biggest issue seen to date is, should an SMS be required and who will the required parties be?</i></p>	

## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	<p>3. Please comment on the sufficiency of the following SMS guidance material, and what, if any, additional information you would need to implement an SMS.</p> <p>a) FAA Order 8000.367, AVSSMS Requirements, Appendix B; b) AC-120-92, Introduction to Safety Management Systems for Air Operators;</p> <p>c) Foreign civil aviation authorities' SMS development material; d) Third party material [e.g., IATA Operational Safety Audit (IOSA), International Standard for Business Aircraft Operations (IS-BAO), Regional Air Cargo Carriers Association (RACCA), Air Cargo Safety Foundation (ACSF)];</p> <p>e) Other (please specify)</p>	
<b>SUMMARY</b>	<p>Overall the maintenance organization guidance is currently inadequate. SMS was developed from an operational standpoint and maintenance was an afterthought. Considerable guidance material development is required for maintenance organizations.</p>	
<b>TEAM DISPOSITION</b>	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
	<ul style="list-style-type: none"> <li>• The concepts of the ICAO framework are appropriate, but the more detailed guidance from ICAO does not apply fully to a design/manufacturing/maintenance environment.</li> <li>• FAA Order 8000.367 Appendix B provides a reasonable outline of broad, conceptual requirements as currently envisioned by FAA.</li> <li>• ICAO Document 9859 is comprehensive and explains the SMS background and philosophy. Its orderly arrangement of material lends itself to extraction of pertinent excerpts, which are useful as management education pieces.</li> <li>• IS-BAO is a little disjointed, with some duplication and sparse direction in some areas, but is head and shoulders above anything else. More concise and less abstract than the ICAO Document 9859.</li> <li>• There are several different development materials available from foreign civil aviation authorities. Most materials are similar in nature; the value of the materials is gained when they are taken in whole and compared with each: UK Safety Regulation Group CAP 712, "Safety Management System for Commercial Air Transport Operators"; CAP 712 Appendix G, "Guidance for Operating a Formal Safety Management System"; UK Safety Regulation Group Safety Management Systems – Guidance to Organizations; ICAO Safety Management Manual (Document 9859); Transport Canada: TP13739, "Introduction to Safety Management Systems"; TP13881, "Safety Management Systems, A Guide to Implementation"; TP13844, "Score Your Safety Culture"; TP14326, "Safety Management System Assessment Guide".</li> </ul>	<ul style="list-style-type: none"> <li>• Currently available SMS guidance material tends to be primarily operation oriented. Little is available for maintenance organizations.</li> <li>• AC 120-92 is not particularly detailed, and therefore not suitable for use as detailed implementation guidance. It should be strengthened and made more complete, integrating lessons learned through the SMS implementation pilot project. Repair stations found it insufficient.</li> <li>• ICAO Document 9859 devotes considerable space justifying the value of an SMS; but, is oriented around aviation operators; all examples provided are all related to airport or airline operations.</li> <li>• SMS guidance material should provide additional guidance in the following areas: Simple, flexible, and applicable guidance material for maintenance, design, and manufacturing organizations and business aircraft flight operations (Part 91K); provide examples of "best practices" for developing and implementing SMS for all sectors of the aviation industry; provide guidance on how audits (QMS, SMS, IS-BAO, etc.) will be managed with the intent of minimizing duplication; clear and consistent terminology, definition, and translation of SMS elements specifically to the activities of design, manufacturing, and maintenance; industry standard for risk assessment and safety performance metrics;</li> <li>• Without clear, concise, and industry-accepted metrics, there is concern that duplicate or even conflicting expectations and regulations may result in confusion and a potential degradation of overall safety.</li> <li>• Small repair station guidance is not addressed.</li> </ul>
	<p>Considerable work is required to provide maintenance oriented guidance. The guidance must clearly delimitate a scalable system for small maintenance operations.</p>	

## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	4. Do you currently have a quality management system (QMS) that meets some accepted standard (e.g., ISO-9000, Six Sigma, Baldrige)? How would you envision your existing system operating in an SMS framework?	
<b>SUMMARY</b>	Maintenance organizations do not embrace the QMS concept as much as the production and operations businesses	
	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
	<ul style="list-style-type: none"> <li>• The SMS program would be defined through a tiered approach, with an enterprise-level definition and oversight of SMS, on par with other management systems such as EH&amp;S, Quality, Ethics, etc. Business units would then maintain SMS activities matching the more specific customer, regulatory, and product requirements, and driven through the enterprise-level activity. SMS could be incorporated into existing QMS structure. The existing QMS is a potential source of information for an SMS process.</li> <li>• Envisions language that requires the certificate holder to maintain a safety management system acceptable by the administrator.</li> <li>• QMS completely meets the intent of the safety risk management and safety assurance elements of SMS for our production system and repair shops. Implementation of SMS should not require any changes to the QMS.</li> <li>• Anticipates becoming fully compliant with SMS framework.</li> <li>• Relatively little change is envisioned to be necessary to integrate the QMS with and SMS.</li> <li>• Anticipates that the SMS will operate in much the same way as its QMS, using the QMS to assure SMS compliance.</li> <li>• Considers it likely that, eventually, the QMS and SMS will become less and less distinct, to the point there might be a single, "Integrated Management System."</li> <li>• Currently undergoing Part 145 Repair Station transition to SMS under the ICAO framework.</li> </ul>	<ul style="list-style-type: none"> <li>• Does not see the QMS operating in an SMS framework. Sees the quality management system as the means to deliver safety management.</li> <li>• Existing QMS is AS9100C, which has a Risk Management provision (Section 7.1.2), where SMS fundamentals are incorporated. Adding SMS would duplicate the current process.</li> <li>• Current QMS per FARs. Do not envision nor want to use SMS framework. A waste of money and time.</li> <li>• Continually enhancing a business framework that draws the best ideas from many of the examples given, but is not subject to any single standard. Locking into a single repetitive standard can create a stagnant service/product. Industry must also be careful to avoid self-perpetuating overhead costs. In a voluntary program industry is able to control the growth or reduction of a management systems as it deems necessary.</li> <li>• Does not see the QMS operating in an SMS framework. There appears to be an assumption in much of the SMS guidance material that QMS concerns itself only with the processes necessary to assure 'quality' of the product or service. Most companies will regard their quality system as the organization, procedures and standards by which they control all that they do, and all that they consider necessary to meet their business objectives. Under such a definition, delivered quality (e.g. lack of defects), meeting of product guarantees and customer expectations through good design, and assuring an appropriate level of safety of the product through design and test, plus the disciplines of assuring continued airworthiness, are all parts of the 'quality system'.</li> </ul>
<b>TEAM DISPOSITION</b>	The positive viewpoints appear to establish how a SMS could be combined with an existing QMS without any support for SMS in general. Whereas, the concerns/issues appear to be specifically against SMS. The positive viewpoints appear to reflect that comments are resigned to the fact that SMS is a done deal. Most positive viewpoints come from Manufacturing where most concerns/issues come from Maintenance	

## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	5. If you have voluntarily developed, or are in the process of developing an SMS, what impact has SMS had on your organization in terms of enhanced safety and compliance with existing CFRs?	
<b>SUMMARY</b>	SMS was perceived as imposing a significant bureaucratic/documentation burden; doubt was expressed that it would result in a commensurate safety benefit	
	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
		<ul style="list-style-type: none"> <li>• It was pointed out that since existing SMS programs vary so widely in performance, elements and outcomes, the ANPRM responses on company's costs benefits and experience will be based on very different understandings of SMS and may not apply to the FAA's implementation. (64.1).</li> <li>• Some comments, especially the engine community which has a very strong, formalized continued operational safety process in place via AC39.8, did not believe that SMS would improve compliance with the CFRs. A few airplane-community comments believed it would be helpful to them in Continued Operational Safety programs.</li> <li>• SMS was perceived as imposing a significant bureaucratic/documentation burden; doubt was expressed that it would result in a commensurate safety benefit.</li> </ul>
<b>TEAM DISPOSITION</b>	There was minimal input from the maintenance community indicating that they have already developed an SMS system. The primary response to this question from the maintenance community was that SMS would impose a significant bureaucratic/documentation burden on the maintenance entities	

## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	6. What types of product/service providers should be required to have an SMS and which, if any, should not? Please explain the reasoning for your opinion.	
<b>SUMMARY</b>	Many comments were received which equated size with the need for an SMS. Large operators and companies favored a SMS requirement for all providers of aeronautical products whereas smaller entities did not see the need. Any SMS Rule must include the concept of scalability in order to address the disparities between less than 10 member facilities and the larger players. There is a belief that the FAA rulemaking for SMS will certainly apply to ALL product and service providers but many in the maintenance community do not support this concept.	
	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
	<ul style="list-style-type: none"> <li>• Most respondents recognized and acknowledged the value of an SMS-like system in the maintenance arena.</li> <li>• A large OEM recommends that all organizations that directly hold a FAA certificate or approval should have a fully functional SMS program. A structure linked to the FAA certificate would enable a set of objective criteria to be established for each certificated activity.</li> <li>• Another OEM recommended a tiered approach for SMS to include manufacturing, overhaul, training facilities and operators. All organizations that hold FAA certificates or approvals should have a fully functioning SMS program appropriately scaled to their level of activity.</li> <li>• With the proper generic SMS principals forming the basis of any FAA regulation or guidance, any aviation service provider or producer of a part product, article, etc should be required to implement an SMS within their company. The SMS principals can be applied in any size company conducting any</li> <li>• All aviation related companies, OEM, repair, overhaul and operations should have an SMS initiative. These are all critical elements for achieving flight safety and ensuring that all are covered by SMS enhances the defenses against hazards.</li> </ul>	<ul style="list-style-type: none"> <li>• Most guidance materials for SMS are tailored toward the aircraft operator and less toward maintenance service providers.</li> <li>• Phased implementation of SMS requirements is vital for a smooth implementation of a safety management system.</li> <li>• Recommend that SMS rulemaking for D&amp;M and maintenance organizations be decoupled from SMS for air carriers.</li> <li>• SMS rulemaking must take into account the scalability of the system.</li> <li>• Lesser case for formal SMS requirements for design, production and maintenance organizations from a European perspective.</li> <li>• Repair stations have already covered this issue in their manuals. OEM's have invested millions in SMS and they see no gain in safety.</li> <li>• There should be no requirement for a SMS for FAA approved repair stations as it would be redundant and would constitute an unacceptable burden on the repair station.</li> <li>• A SMS may have a place in a larger repair station. In a small repair station where only 2 or 3 people work on an aircraft or unit, it is easy to keep and track records. A full SMS would be a large issue for a smaller repair station to deal with.</li> <li>• SMS regulation should be a requirement for commercial airlines. They should in turn be responsible for flowing down any requirements to their suppliers.. There should be no SMS requirements for suppliers to TC, STC, PC and PMA holders. The certificate holder's SMS program should include the products that their supply base manages.</li> <li>• SMS is necessary for all due the international ICAO requirement</li> </ul>
<b>TEAM DISPOSITION</b>	All maintenance facilities should have a functioning SMS system of some sort. The SMS rulemaking MUST be scalable and compatible to the various aviation service providers by organization type. Where the maintenance takes place in the flight-ready chain is critical in determining risk assessment and mitigation. The risk assessment and mitigation plans must fit the organization type but they must ensure that safety critical issues are addressed and properly prioritized. The FAA must be trained and consistent. International operations without an SMS will be at a competitive and regulatory disadvantage.	

## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	7. If you have implemented an SMS and conducted cost and benefits analyses, please describe your findings.	
<b>SUMMARY</b>	<p>The majority of the responses state that an SMS has not been implemented and even fewer have attempted and/or completed any type of a cost / benefit analysis. The bulk of the responses were based around concerns/issues regarding the implementation of a SMS, though some expressed optimism about SMS being a positive program in the future and identified various potential benefits. The most significant concern expressed was regarding the lack of ability to complete a true and useful cost / benefit analysis. The reductions of risk and safety enhancements are not very definitive and may not be directly related to cost.</p> <p>A few responses questioned whether there are any tangible benefits associated to the implementation of an SMS and believe that the extra cost would become a huge burden upon industry and/or their organizations. There is also a concern that a requirement for a SMS for a company that currently has a fairly mature QMS would merely create extra work and duplication of effort.</p>	
	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
	<ul style="list-style-type: none"> <li>• The overwhelming majority of responses note that a cost / benefit analysis has not been accomplished.</li> <li>• According to past safety initiatives, optimism exists that SMS will continue to show tangible benefits in quality metrics.</li> <li>• SMS has been identified in being beneficial by: <ul style="list-style-type: none"> <li>○ decreasing the number of incidents and accidents associated with products and services;</li> <li>○ reducing pressure to take a flight under less than desirable conditions;</li> <li>○ reducing insurance premiums (potentially up to 20%);</li> <li>○ any flight cancellations would now be the result of objective data and be determined by group consensus;</li> <li>○ having a formal process, including no jeopardy to employees, in place to report hazards and irregularities;</li> <li>○ fewer customer damage reports;</li> <li>○ fewer incidents associated to equipment damage;</li> <li>○ showing a reduction in lost time injuries;</li> <li>○ resulting in less internal rework by having fewer product escapes; and</li> <li>○ establishing a positive shift in work culture within an organization.</li> </ul> </li> <li>• Experience with existing safety programs indicates a business case can be made for SMS implementation.</li> <li>• SMS has been a positive aspect for our marketing efforts, being that we are one of the few organizations that can state that we have an internationally recognized SMS already in effect.</li> </ul>	<ul style="list-style-type: none"> <li>• A cost / benefit analysis of a safety program is very difficult to conduct due to the difficulty to attribute safety enhancements directly to cost savings. This is also due to the fact that effectiveness of safety is not normally very definitive in results. In addition, any attempts to assess the reduction of risk carried by the organization are very subjective.</li> <li>• It may be easier to estimate the cost involved with implementation and operation of an SMS than to identify definitive benefits.</li> <li>• A concern was voiced that SMS should not be regulated in a free market industry due to it being a marketing tool for competition.</li> <li>• There is a concern that the development and implementation of new regulations mandating safety management systems for the design and manufacturing sector could potentially disrupt effective systems in place today, and could inadvertently cause resource burdens to implementing organizations that may escalate significantly beyond the value of the benefits realized.</li> <li>• In the situation of a company having a Quality Management System (QMS) and/or Continuous Analysis and Surveillance System (CASS), many requirements would become overlapping or duplications for two separate safety programs. Due to this possibility, there is belief that no benefit from SMS would exist and would only increase the cost of doing business.</li> <li>• There are a few organizations that feel the implementation and operation of an SMS will force their company out of business and are entirely against any regulations requiring implementation of an SMS.</li> </ul>
<b>TEAM DISPOSITION</b>	<p>The majority of the responses indicate that not many maintenance organizations have implemented an SMS let alone completed any cost and benefit analysis. Numerous benefits were noted throughout the responses, but no specific data was included in direct support of them. It still continues to be very difficult to show tangible benefits of a safety program directly related to cost. Also, a concern has been noted that when a company that has already implemented another safety program (i.e. QMS, CASS) there would be a large amount of duplication between an SMS and their current safety program.</p>	

## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	8. What are your main concerns and recommendations in making the transition to an SMS regarding the following? 8a. Documentation Requirements; 8b. Recordkeeping Requirements; 8c. Collection, Sharing, Management of Safety Information	
<b>SUMMARY</b>	This page summarizes ANPRM comments made generally to all parts of the question.	
	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
	<ul style="list-style-type: none"> <li>• The successful operation of safety risk management in the global air transportation system requires effective information flow in a variety of contexts: within organizations; across company boundaries; between industry sectors; and between industry, regulatory and investigative agencies. Harmonization of standards for recording, reporting, and communicating safety data and information offers potentially significant benefit.</li> <li>• Currently see no problems ensuing when looking at current document system</li> <li>• This implies that at the time of validating an operator's SMS, FAA must allow for flexibility in assessing the effectiveness of the operator's SMS.</li> <li>• There is currently no cost effective automated system to help manage an SMS for large operators. Some would recommend further development and additional funding for Web Based Application Tools to help meet this need.</li> <li>• Separate data collection and analysis programs are often incompatible and don't communicate efficiently with one another, if at all. One system that collects, analyzes, assesses, tracks, assigns corrective actions and provides loop closure for all data sources (ASAP, IEP, FOQA, Line Operations Safety Audit) would be the most effective use of these resources</li> </ul>	<ul style="list-style-type: none"> <li>• We are already a highly regulated industry, being subjected to so many different sets of regulations and procedures that our employees find it difficult just to be aware of what they are responsible to know and operate within. Adding another layer of process on top of the existing numerous ones.</li> <li>• Protection of safety data and information remains an industry concern that inhibits progress in this area. Protection of this data and company personnel who work with it from criminal proceedings is also a concern.</li> <li>• Concerned that mandatory requirements broadly shared (or become accessible through FOIA) would undermine ability to protect data as confidential and proprietary information.</li> <li>• Repair stations will have to develop additional processes and documentation. The multiplying effect of this must be considered.</li> <li>• Depending on the size of the operation, the documentation process can be costly and taxing on company resources.</li> <li>• Concerns in all three areas while in the process of formulating an SMS program as the rulemaking matures. These concerns would include, but are not limited to; proprietary information and increased costs.</li> </ul>
<b>TEAM DISPOSITION</b>	The concerns/issues far outweigh the positive viewpoints. There are literally no positive viewpoints from Maintenance. The positive viewpoints listed are at best, a stretch by the industry to find a way to comply. Companies on the smaller end of business size are very concerned overall with all elements of question # 8	



## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	8. What are your main concerns and recommendations in making the transition to an SMS regarding the following? 8a. Documentation Requirements;	
<b>SUMMARY</b>	This page summarizes ANPRM comments made generally to 8a.	
	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
	<ul style="list-style-type: none"> <li>• Excellent guidance on development of manuals, policies, procedures, and standard operating procedures already exists for the general aviation industry at zero or low cost.</li> <li>• Do not pursue mandating SMS until industry and FAA can come together to review, compromise and jointly endorse an approach that makes sense for all. Perhaps using RTCA as the body to facilitate this process would be beneficial.</li> <li>• The main recommendation (if SMS is considered necessary for all types of organization) would be to avoid prescriptive requirements on the organization structure, roles or expected processes, and present applicants with an expectation of the outcome and performance of the system, allowing each organization to make the best use of its existing systems, and presenting FAA inspectors with simple tests for the system to assess each one in a consistent manner</li> <li>• Larger approval holder organizations already have many policies, procedures, and processes that satisfy a variety of SMS functions. The SMS guidance documents refer to the need for a SMS Manual. Such a manual must be permitted to refer (or “point”) to existing policies, procedures, and processes and not be required to reproduce them for SMS purposes. Documentation requirements must provide for an SMS that is auditable, but at the same time scalable with the SMS</li> </ul>	<ul style="list-style-type: none"> <li>• FAR, ICAO, and AC language and requirements that must be met. Will the FAR, ICAO, and AC language be written vague, academic based, and not practical? Thousands of Principal Maintenance Inspectors that will attend a SMS class and become instant experts and invoke what they have learned [right or wrong] on Repair Stations with wide variation from inspector to inspector. This will lead to constant “Corrective Actions” and Repair Station Manual Changes.</li> <li>• The time required to develop a redundant manual and then having to update existing manuals to reflect its incorporation.</li> <li>• The expense. Certificated Repair Stations already have a massive burden of paperwork, regulations and oversight, This would add another layer that would be completely redundant and unnecessary. In a small repair station the man hours it takes to sit and do the logistics of implementation of SMS or any regulations for that matter must be balanced against the fact that the individuals that spent their time doing this ( which will be the most knowledgeable and experienced) will have to subtract that time from doing what they are really needing to do which is putting their eyes on the work and processes being accomplished at the repair station. The net result of this could very possibly be a net reduction in quality of work and the safety of the completed operation.</li> </ul>
<b>TEAM DISPOSITION</b>	Positive viewpoints are really only suggestions as to how the documentation requirements could work. These are suggested by everyone except maintenance. Again, there are no positive viewpoints from the maintenance sector. It appears concerns and issues may be due to lack of or misunderstanding of SMS. Comments generally appear to be looking negatively on SMS without knowing all there is needed to know	

## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	8. What are your main concerns and recommendations in making the transition to an SMS regarding the following? 8b. Recordkeeping Requirements;	
<b>SUMMARY</b>	This page summarizes ANPRM comments made generally to 8b	
	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
	<ul style="list-style-type: none"> <li>Recordkeeping requirements for hazard identification, risk assessment, and corrective actions should be established by the organization with the industry's best practices in mind. Recordkeeping requirements should be written and defined by the organization, and audited at least annually by the company's Internal Evaluation Program or third party if an IEP does not exist.</li> <li>Based on the FAA SMS Implementation Guide, as part of any SMS program a company must have a records management policy. If the FAA has concerns about record retention periods, those concerns should be specifically addressed via a change in the current FAA regulations. So long as a company is compliant with the document retention rules in the current regulations, it seems inappropriate for the FAA, as part of an SMS program, to dictate whether or how a company should develop a document management program. Protection of safety data for both record-keeping and data collection requirements of SMS must be addressed before collection and tracking of data begins</li> <li>One of the fundamental building blocks of an SMS is an effective internal reporting program. For the smaller Service Providers, the most efficient way to begin is by implementing the FAA sponsored WBAT program. The WBAT ASAP program has now been expanded to meet the parameters needed for development of the SMS.</li> </ul>	<ul style="list-style-type: none"> <li>Recordkeeping currently is hard to accomplish. We have both a Proactive and Reactive database and we had to modify each one to capture initial and residual risks to demonstrate "objective evidence" to any potential auditor.</li> <li>From a safety standpoint, a company should keep this type of data to learn from their history. This would create a great core safety database. From a business standpoint, this would be considered a database of imperfections with specific admittance of fault.</li> <li>The process takes valuable time away from productive and revenue producing business. Over the years, cumulative months have been invested in writing and rewriting the existing RSM and QCM to satisfy changing views of the FAA. For the most part, these manual changes have not resulted in any meaningful improvement to safety or regulatory compliance. Transitioning to an SMS would require additional time. Time that is not available. Time that might otherwise be spent investigating and correcting real problems which might indeed be safety issues</li> <li>A big waste of finances and time</li> <li>Time consuming overkill. If I as one individual fail to identify a risk it can only be used against me in any kind of legal action.</li> </ul>
<b>TEAM DISPOSITION</b>	No positive viewpoints from the maintenance sector. Even the positive viewpoints listed are but an attempt to find a way to comply. Much like comments regarding documentation, these appear to be based on a lack of or misunderstanding of SMS. "If it's new, it has to be bad"	

## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	8. What are your main concerns and recommendations in making the transition to an SMS regarding the following? 8c. Collection, Sharing, Management of Safety Information	
<b>SUMMARY</b>	This page summarizes ANPRM comments made to 8c	
	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
		<ul style="list-style-type: none"> <li>• There are proprietary and litigation concerns. If we share an issue we resolved and how we overcame it, could this be used later against us in any punitive manner by the FAA? In the last 5 years, we have heard two messages from the FAA; one is a participative approach and one is a return to a punitive culture</li> <li>• The liability of assessing risk to a specific task can become a great liability if summoned and used in a court of law.</li> <li>• The process takes valuable time away from productive and revenue producing business.</li> <li>• Opening up to legal action. Once I put something in writing or fail to put something in writing then I am held accountable forever.</li> <li>• Being a small CRS the cost in time and money are a huge issue. If the SMS systems require a small CRS to develop a full SMS system, the cost may lead to closing. Suggest there be different levels of SMS systems depending on the size of the CRS.</li> <li>• As a privately held incorporation, we are able to keep some aspects of our business proprietary. The SMS system certainly threatens to make financial and safety information a matter of public record. There are no safeguards in SMS guidance to protect against litigation. So in essence, aviation companies will have to mitigate all identified risk down to zero or be subject to lawsuits if anything should go wrong.</li> </ul>
<b>TEAM DISPOSITION</b>	Could not detect any positive viewpoints for question 8c. All comments are extremely concerned about the liability of sharing information that would otherwise be considered proprietary	

## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	9. What are the initial and recurrent costs of establishing and maintaining SMS processes (e.g., internal auditing and evaluation, data collection, employee training, computer software, personnel hiring and training)?	
<b>SUMMARY</b>	It was pointed out that this cost and resource burden could detract from existing safety systems and processes.	
	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
	<p>The following approaches to mitigating the burden were proposed (in no special order):</p> <ul style="list-style-type: none"> <li>• Gap analysis comparing SMS to existing regulations or requirements. It was suggested that SMS requirements not duplicate existing requirements, or that the MOC for existing requirements be explicitly accepted as also showing compliance with the SMS requirement.</li> <li>• Many requests to allow use of existing systems in showing compliance. Most comments who expressed an opinion on the relationship of SMS and QMS proposed that SMS be integrated into existing QMS systems.</li> <li>• Use language of ICAO or of national SMS Standard or of CDO ARC. The AS9100 standard was pointed out as an excellent example to follow.</li> <li>• Some comments said that they had found SMS tools to be helpful in cost savings or reducing quality escapes</li> </ul>	<ul style="list-style-type: none"> <li>• It was pointed out that since existing SMS programs vary so widely in performance, elements and outcomes, the ANPRM responses on company's costs benefits and experience will be based on very different understandings of SMS and may not apply to the FAA's implementation. (64.1).</li> <li>• Many comments expressed concern over the potential cost and resource burden entailed in showing compliance with SMS requirements.. One commenter (a private individual) requested that cost not be considered.</li> <li>• It was pointed out that this cost and resource burden could detract from existing safety systems and processes.</li> </ul>
<b>TEAM DISPOSITION</b>	Cost data was not provided but the overall the common response was that the cost would depend on the actual scope of SMS once a rule was issued. The cost could be minimal if the maintenance entities are able to take advantage of existing systems the cost would go up significantly if the maintenance entities were forced to develop new processes.	

## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	10. What impact has SMS had on your organization in terms of the resources necessary to implement and maintain the system?	
<b>SUMMARY</b>	The experienced organizational impact has varied based on the responding organization function and scope. Larger organizations felt that the SMS requirements were duplicative to existing safety and quality systems. Organizations with multiple locations might struggle with coordinated efforts of implementing SMS and ensuring consistency in the risk assessment process. Smaller organizations that do not have a developed quality assurance department will struggle under the financial burdens of implementing SMS both in terms of the headcount and information technology requirements. One critical underlying concern is how will the safety risks be accessed through the same lens? The awareness and on-going training requirements are on the major hurdles to ensure alignment with the SMS requirements through the organizations. For those organizations that have started the implementation, the initial investment in personnel is significant with the resource requirements diminishing as the SMS program matures. The dedicated headcount estimates ranged from one to ten individuals.	
<b>TEAM DISPOSITION</b>	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
	<ul style="list-style-type: none"> <li>• Organizations with existing quality and safety assurance stand alone departments believe that very limited incremental resources will be needed to maintain SMS. Some resources will be needed for initial implementation.</li> <li>• Several organizations believe that the SMS implementation has demonstrated value.</li> <li>• The majority of responders have not started SMS implementation. The impact dataset is limited</li> </ul>	<ul style="list-style-type: none"> <li>• The resources needed to implement SMS is highly dependent on the regulatory language, guidance material, and the training of FAA personnel</li> <li>• The added resources will be duplication of the existing Quality Management System (QMS) process because the same information used in QMS will apply to SMS. Organization will not be able to justify the added burden and will likely reduce or reuse the QMS resources.</li> <li>• Small businesses are unlikely to be able to absorb the economic burden of finding/hiring a safety analyst or to pay for existing employees to be trained as safety analysts; recognize the existing pool of safety analysts is limited.</li> <li>• Some organizations/individuals within the industry are questioning the necessity and/or benefit of implementing a SMS; lack of existing industry cost/benefit analysis. Recognize that the most important elements (compliance with current regulations and enhancement of safety) are already addressed by the present system.</li> <li>• The availability of SMS development and training opportunities is a general concern.</li> <li>• FAA pilot projects have had numerous midstream modifications, causing repetitive work. Standards for effectiveness, documentation, and reporting must be clearly established and well-defined (after taking into account concerns from operators).</li> </ul>
	The sample size is not big enough to draw conclusions and the differences in organizational experience of those participating in the existing pilot programs are varied and the programs appear to be in the infancy stage. However, there is some indication that SMS is not well defined, for example the comment on the FAA pilot projects. Thus comparisons in terms of resource requirements are difficult and there was not enough hard data to answer this question.	

## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	11. What new knowledge, skills, and abilities would your organization need, if any, to operate successfully within an SMS?	
<b>SUMMARY</b>	Generally, the consensus agreed that a significant investment in training at all levels of an organization will be required. Selected personnel will need a comprehensive understanding of the regulatory requirements defining, implementing, and maintaining any FAA proposed SMS program. Additional training and data collection/analysis assets might be necessary dependent upon the scope of the regulations. A few believed that no new technical skills would be required for the majority in an organization, beyond gaining an understanding of SMS concepts and objectives.	
	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
	<ul style="list-style-type: none"> <li>• Implementation of a mandatory SMS within an airline could give rise to a whole new level of management sophistication where the services of college trained, internal or external auditors, and evaluators will be essential for survival in the regulatory environment.</li> <li>• A “mass” of SMS trained facilitators would be positioned at every level of the organization focused on increasing the level of safety within an organization.</li> <li>• Implementing and maintaining a SMS will require a commitment at all levels of an organization to incorporate and continually improve safety in all aspects of an organization’s operations.</li> <li>• If a prescriptive approach is taken by the FAA (or another regulatory authority) to impose an organization structure and roles, personnel may need to be reallocated and retrained, but the underlying systems would remain largely unaltered.</li> <li>• General consensus from responders that to ensure SMS effectiveness, training would be required for the following:             <ol style="list-style-type: none"> <li>(1) Increased ability to conduct safety investigations and provide useful recommendations;</li> <li>(2) Human factors analysis to a deeper level;</li> <li>(3) ‘Just Culture’ (development of a safety culture).</li> </ol> </li> </ul>	<ul style="list-style-type: none"> <li>• Implementing an SMS across the aviation industry will require effective training, understanding, and execution of both the regulated and the regulator to ensure a common understanding and a common enforcement method by the regulator.</li> <li>• SMS will require training at all levels. Line employees, as well as, all members of management, including the CEO, must be trained on the philosophy, expectations, and processes of a properly executed SMS. Without that common understanding, SMS will not achieve its full potential.</li> <li>• A safety culture, optimally a ‘Just Culture’, would need to be established, and all employees would need to develop trust and confidence in the appropriate use of safety and enterprise improvement reports.</li> <li>• To effectively implement a SMS, our organization will need to have guidance materials and training materials that are scaled for a small Repair Station.</li> <li>• Specific guidance will need to be made available across all organizations within an operation that will raise awareness of safety metrics each organization is responsible for and should be monitoring and providing to SMS.</li> <li>• The success of an SMS will be contingent on the level of competency of the individual responsible for developing, implementing, managing, and sustaining the SMS. Given the magnitude and scope of this requirement, it will be understandably difficult for smaller operators to resource the requisite personnel and system elements without low-cost and fully developed examples, formats, templates, and solutions readily available for their use.</li> <li>• A “critical mass” of SMS trained facilitators will be required at various levels within an organization; initially, this will have a significant impact (resource/manpower issue) on the industry.</li> </ul>
<b>TEAM DISPOSITION</b>	Overall, the team felt that additional knowledge, skills, and abilities will be required. The team also believes that supporting guidance material could significantly benefit SMS implementation. Recognize that a majority of the organization would only require general guidance/awareness on SMS scope/regulations to successfully function within an SMS, but a select group of trained focals/leaders within the organization would require a much more comprehensive level of knowledge and associated skills/abilities. The team agrees that additional guidance addressing specific tasks (e.g., the measurements an SMS would focus on and the processes for identifying/analyzing these metrics) may also be required.	

## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	12. Please give us your thoughts about the current processes for procuring and using voluntarily submitted safety data through FAA programs such as Aviation Safety Action Program (ASAP) and how these programs would fit within an SMS framework.	
<b>SUMMARY</b>	In addition to ASAP, comments also made reference to other safety data programs such as FOQA, ASRS, ECCAIRS (EASA), MSAD.	
	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
	<ul style="list-style-type: none"> <li>• ASAP and other external safety data sources are currently not used. We do believe we should use these data and their lessons learned in advancing our own safety culture. In Europe we have the ECCAIRS initiative via EASA. We do not currently believe however that for the time being ECCAIRS will be of much help in Maintenance.</li> <li>• The ASAP program can be a great tool when used and managed correctly and accepted company wide. This program will be a large part of employee reporting. Being a non-punitive employee self-reporting program that allows the employee to remain anonymous is very beneficial, especially when the reporting employee will still receive direct correspondence of the action taking to correct the possible non-compliance issue.</li> <li>• We have used the ASAP program in the past and it seemed to work fine for our issues.</li> </ul>	<ul style="list-style-type: none"> <li>• Would prefer not to use ASAP program for any procurement of a SMS initiative but would rather use general industry support from ISO entities.</li> <li>• The current programs are adequate and sufficient apart from an SMS. Under an SMS, they would likely be redundant.</li> <li>• Many occasions of non-compliance have several culpable companies. The ASAP program is beneficial for the first company to submit a report. The first company to submit is usually the operator. The maintenance provider is the last to know and consequently the last to report. The maintenance provider is left "holding the bag". For this reason the voluntary self-disclosure programs are flawed and must be fixed and or optional.</li> <li>• We currently have an internal audit group with closed loop system to ensure all corrective actions and preventative actions are effective over time. ASAP would require more paperwork for a program that has already proven effective.</li> <li>• Integrating data between ASAP, FOQA, ASRS and SMS is not practical. Controls associated with those programs are too complex for what would be needed for SMS.</li> </ul>
<b>TEAM DISPOSITION</b>	From the Maintenance Comments, the results are split down the middle. Half the comments were positive, and half were concerns. From the other groups, although not related to maintenance, the comments were again split down the middle.	

## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	13. What areas of current regulations do you believe already incorporate SMS principles (e.g., continuing analysis and surveillance system (CASS) under 14 CFR 121.373; quality or inspection system requirements under 14 CFR 21.143 and 21.303)? How would you suggest the FAA avoid any duplicative requirements in any SMS rulemaking effort?	
<b>SUMMARY</b>	Many comments stated that SMS elements duplicate existing internal processes or existing regulatory requirements,	
	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
		<ul style="list-style-type: none"> <li>Many comments stated that SMS elements duplicate existing internal processes or existing regulatory requirements, especially existing type certification processes for the design sector and QMS processes and requirements for the manufacturing and maintenance sectors.</li> </ul>
<b>TEAM DISPOSITION</b>	Many comments indicated a preference to a more open rule that would allow the maintenance entities to utilize existing processes to meet the intent of the SMS requirements; this would allow an easier and less costly method of compliance with the SMS requirements.	



## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	14. What concerns and recommendations do you have about setting objective standards for the evaluation of SMS processes (e.g., evaluating SMS effectiveness, defining scope of hazards, establishing acceptable levels of risk)?	
<b>SUMMARY</b>	Small organizations are the most concerned and see little to no value but large burden. No cost/benefit analysis has been established. There is concern that SMS must be scalable while still holding to the safety requirement. Explicit regulations capable of supporting object evidence finding and uniform implementation/compliance by the FAA are necessary. Credit needs to be given for existing safety systems that may already meet the requirements rather than implementing a new system. The FAA needs to work with international NAAs so that there are not multiple and possibly conflicting requirements.	
	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
	<ul style="list-style-type: none"> <li>• As any company would want to achieve a safer environment and overall more efficient workplace</li> <li>• Assessing risk is a good practice</li> <li>• Objective standards for an SMS evaluation could be gathered by a thorough process that would evaluate the effectiveness and compliance rate of SMS covered procedures. Such a thorough evaluation of systems, best practices, and lessons learned would provide a basis for standards.</li> <li>• Organizations with existing quality and safety assurance stand alone departments believe that very limited incremental resources will be needed to maintain SMS. Some resources will be needed for initial implementation.</li> <li>• Several organizations believe that the SMS implementation has demonstrated value.</li> </ul>	<ul style="list-style-type: none"> <li>• There is confusion as to what SMS is or is focused on</li> <li>• Current SMS information is academic in nature and subject to interpretation</li> <li>• Safety culture is hard to regulate and even harder to demonstrate.</li> <li>• FAA pilot projects have had numerous midstream modifications</li> <li>• Need very clear and objective requirements to minimize the variation</li> <li>• Variation in interpretation will result between PMIs, themselves, and shops</li> <li>• Concern that the FAA will not accept the maintainer's risk assessment and planned action priority based on severity and likelihood, particularly if caused by a violation, where the maintainer's safety priority and FAA's regulatory priority are in conflict.</li> <li>• Assigning specific levels of risk creates additional litigation liability</li> <li>• Standard risk assessment system would be unwieldy causing variations</li> <li>• Many concerns over the "acceptable level of risk" concept.</li> <li>• Few definitive statistics show direct improvement by SMS</li> <li>• Expense of developing manuals, systems, etc with no real safety benefit</li> <li>• May force small shops to close</li> <li>• SMS must take into account the size, scope and/or complexity but uniform safety</li> <li>• SMS will result in a highly prescriptive designed primarily for large air carriers</li> <li>• Interpretation differences and disagreements at the international level.</li> <li>• Phase in is necessary</li> <li>• Credit needs to be given for existing safety systems that may already meet the requirements rather than implementing a new system</li> <li>• Duplication of the existing Quality Management System (QMS) is an added burden and will likely dilute, reduce or reuse the QMS resources.</li> <li>• The most important elements (compliance with current regulations and enhancement of safety) are already addressed by the present system.</li> </ul>
<b>TEAM DISPOSITION</b>	There is substantial concern whether SMS should be implemented and, if implemented, how it can be properly scaled to take in the wide range of operations and not be an undue burden, particularly on small repair stations. The responses point to the fact that SMS has to a great degree been discussed in academic terms and some comments that the FAA pilot projects have had multiple changes as to what is required. Where the maintenance takes place in the flight-ready chain is critical in determining risk assessment and mitigation. The risk assessment and mitigation plans must fit the organization type but they must ensure that safety critical issues are addressed and properly prioritized. The FAA must be trained and consistent.	

## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	15. What are practical ways a small business could apply the elements of an SMS?	
<b>SUMMARY</b>	<p>Numerous viewpoints support the basic concept of requiring a SMS for small business, but there are various opinions regarding the appropriate level of complexity required and numerous concerns were expressed regarding SMS scalability/flexibility, adequacy and availability of existing implementation advisory materials for small businesses, existing personnel availability and/or required skills deficiencies, etc.</p> <p>NOTE: Future rulemaking must address the concerns/issues identified and minimize the financial burden for small business.</p>	
	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
	<ul style="list-style-type: none"> <li>• Any organization, regardless of size, can benefit from the use/application of SMS elements and principles.</li> <li>• Organizations of all sizes must have the latitude and flexibility to implement efficient systems, appropriate to the nature and scope of their operations. <ul style="list-style-type: none"> <li>○ Any future rulemaking must ensure that SMS requirements be scalable, flexible, and adaptable; requirements should be phased in gradually.</li> <li>○ Small businesses need to make use of as many existing company business systems, as possible, to minimize overhead costs.</li> </ul> </li> <li>NOTE: It may be plausible to incorporate key elements of an SMS into their existing QMS or other established processes.</li> <li>• Practical organizational implementation strategies include building on and improving existing processes; leveraging internal and external best practices; and keeping systems simple, usable, and effective. <ul style="list-style-type: none"> <li>○ Advisory material, including examples of FAA expectations for various types and sizes of organizations, must be provided to assist SMS implementation.</li> <li>○ The FAA should establish a program for small business to assist with SMS education/training and implementation.</li> <li>○ The International Helicopter Safety Team (IHST) SMS Toolkit was designed for small operators and provides an excellent example of large-scale SMS programs that have been scaled down for small businesses (organizations).</li> </ul> </li> <li>• EASA has proposed a model wherein smaller, less complex businesses need not have as thorough an SMS as larger, more complex businesses (further investigation required).</li> <li>• Small businesses will likely have the ability to drive cultural change more quickly than large businesses/organizations; benefiting future implementation efforts.</li> </ul>	<ul style="list-style-type: none"> <li>• It is essential that any future rulemaking result in a single level of safety across the aviation industry.</li> <li>• SMS use/application requirements for a small business needs to be simplified and should maintain focus on the overall goal – the management of risk. <ul style="list-style-type: none"> <li>○ Significantly reduce the requirements associated to policies and procedures to reduce the burden for small businesses.</li> <li>○ FAA may need to assume the hazard identification responsibilities (i.e., data collection, identifying and classifying hazards, conducting risk assessments) for small businesses and communicate the required/expected risk control actions required.</li> <li>○ Onerous recordkeeping requirements and/or mandates for dedicated personnel need to be addressed.</li> <li>○ It is critical that any future rulemaking take into account the financial burden of implementing an SMS for small businesses.</li> </ul> </li> </ul> <p>NOTE: It may be that, below a certain size of company, the requirement to embrace the SMS philosophy and implement key elements and principles, rather than requirement for a formal SMS would be a more practical approach.</p> <ul style="list-style-type: none"> <li>• Small businesses are unlikely to be able to absorb the economic burden of finding/hiring a safety analyst or to pay for existing employees to be trained as safety analysts; recognize the existing pool of safety analysts is limited.</li> <li>• Numerous concerns exist regarding the availability and/or adequacy of advisory material for SMS use/application for small businesses.</li> <li>• Some organizations/individuals within the industry are questioning the necessity and/or benefit of implementing a SMS; lack of existing industry cost/benefit analysis. Recognize that the most important elements (compliance with current regulations and enhancement of safety) are already addressed by the present system.</li> </ul>
<b>TEAM DISPOSITION</b>	<p>Various opinions/options were provided regarding potential and/or practical ways a small business could apply the elements of an SMS. There were concerns expressed regarding the adequacy and/or availability of guidance materials for SMS application for small businesses. Furthermore, the economic burden and/or safety analysts availability could impact SMS implementation.</p>	

## Attachment B – ANPRM Question Summaries

<b>QUESTION</b>	16. What are your concerns and recommendations regarding the FAA making the transition to requiring SMS of product/service providers (e.g., schedule for implementation, FAA acceptance and approval procedures, oversight)?	
<b>SUMMARY</b>	Maintenance comments lead the way in concerns/issues expressed.	
	<b>POSITIVE VIEWPOINTS</b>	<b>CONCERNS/ISSUES EXPRESSED</b>
	<ul style="list-style-type: none"> <li>• SMS can work if it is to be integrated into a company's corporate culture and to not be a stand-alone function. Changing from an integrated SMS to a stand-alone SMS function would be financially burdensome and would not result in increased safety.</li> <li>• To meet the expectations of the SMS implementations, requirements can be streamlined to provide the service providers latitude and scalability depending on the scope of their operations.</li> <li>• Support for the concept of SMS. Many already have in place most of the attributes of an SMS program. Concern is with the process by which the FAA will approve and oversee SMS. Guidance for the FAA in approving and overseeing a SMS program for operators as important as the rule itself.</li> <li>• An initial SMS is relatively simple to implement for any product/service provider. A period of one year should, be sufficient for initial deployment. To encourage continuing improvement, this initial development period should be followed by a multi-year period during which product/service providers show continuous improvement of their SMS programs. FAA should fast-track SMS implementation to the extent possible. Industry will understand the benefits of rapid implementation.</li> </ul>	<ul style="list-style-type: none"> <li>• The FAA must make allowance for the fact that each and every organization is unique. Each organization shall have a custom made SMS to fit its cultural background and characteristics. So rulemaking should allow for that</li> <li>• That the FAA will not recognize that some Repair Stations have AS9110/2008 implemented and will not recognize this industry standard as "acceptable" to the Administrator. If this is not the case, considerable costs substantiating that our system complies with the new FAA requirements will be incurred. We will have to make schedules, implementation plans, submit them to the FAA, and have an on-site FAA audit before it is accepted.</li> <li>• More financial and time consuming burden on myself as shop owner/manager. Concern for the viability of a small business and its survival due to cost of the program, and legal liability.</li> <li>• Look at a small CRS and see how they can deal with this. The small CRS in the US today will need help from a trade group or other body that can help them thru this process. If we have to try and do a full SMS alone, we will close up.</li> <li>• Concern is that potential SMS regulations do not undo or disrupt effective, efficient safety systems in place today.</li> </ul>
<b>TEAM DISPOSITION</b>	The concerns/issues expressed are all from the Maintenance comments. There were no positive viewpoints from Maintenance. The positive viewpoints have been gathered from the other comments. Even at that, the positive viewpoints really were not so much in support as they were simply offering recommendations as to how SMS can be implemented	

**APPENDIX C – DESIGN AND MANUFACTURING WORKING GROUP REPORT**

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**FAA Safety Management Systems  
Aviation Rulemaking Committee  
(SMS-ARC)**

**Design and Manufacturing  
Working Group (D&M) Report  
High-Level Recommendations for SMS Requirements**

**March, 12, 2010**

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## **TABLE OF CONTENTS**

---

<b>SECTION 1: Introduction.....</b>	<b>2</b>
<b>1.1 SMS-ARC Background .....</b>	<b>2</b>
<b>1.2 Design &amp; Manufacturing Working Group Tasking &amp; Report.....</b>	<b>2</b>
Review of Comments to SMS ANPRM .....	3
Gap Analysis and Exceptions Assessment.....	3
D&M Report on High-Level Recommendations for SMS Requirements .....	4
<b>SECTION 2: Comments in Response to FAA Questions .....</b>	<b>5</b>
<b>2.1 Should the FAA issue regulations on SMS? .....</b>	<b>5</b>
International harmonization and Reciprocal Acceptance .....	6
Phased Promulgation of SMS Regulations .....	6
Phased Implementation of SMS Requirements .....	7
Recognize Existing Systems and Processes.....	9
Recognize Certification Procedures and Airworthiness Requirements .....	9
Scalability and Flexibility of SMS Requirements.....	10
Protection of SMS Safety Information .....	10
FAA Plan for D&M Sector SMS Oversight Activity .....	11
Alternatives to SMS Implementation Through Regulation .....	11
<b>2.2 If so, who should SMS regulations apply to? .....</b>	<b>12</b>
SMS Requirements Should Apply to Certain Design/Production Approval Holders.....	12
Statutory Legal Authority Issues: SMS Requirements Upon Design Organizations.....	13
Regulatory Issues: SMS Requirements Upon Design Organizations .....	14
<b>2.3 What should the SMS regulations address? .....</b>	<b>16</b>
Aviation Safety vs. Workplace Safety .....	16
Non-Prescriptive and Performance Based (ICAO SMS Framework Level) .....	16
<b>2.4 What should the guidance material address? .....</b>	<b>17</b>
<b>2.5 Explanation of the SMS ARC recommendations.....</b>	<b>20</b>
Justification (reasoning) for rule change.....	20
Explanation of Benefits.....	21
Explanation of Costs .....	22
Harmonization with International Standards .....	23
<b>SECTION 3: Summary of D&amp;M Recommendations .....</b>	<b>24</b>
<b>3.1 Recommendations in Response to FAA Questions .....</b>	<b>24</b>
<b>3.2 Recommendations for Next Steps.....</b>	<b>25</b>
Review of SMS Requirements in Order 8000.367, Appendix B .....	25
Definition of “Hazard” in Design and Manufacturing Environment.....	25
<b>SECTION 4: APPENDICES.....</b>	<b>27</b>
<b>A. SMS-ARC D&amp;M Members .....</b>	<b>A-1</b>
<b>B. Summary of ANPRM Comments from D&amp;M industry sector .....</b>	<b>B-1</b>
<b>C. Regulatory Gap Analysis – Executive Summary .....</b>	<b>C-1</b>
<b>D. Gap Analysis: Part 21 Design and Order 8000.367 Appendix B Requirements .....</b>	<b>D-1</b>
<b>E. Gap Analysis: Part 21 Manufacturing and ICAO SMS Framework Requirements .....</b>	<b>E-1</b>
<b>F. Gap Analysis: Extent to Which Part 21 D&amp;M Addresses SMS Framework.....</b>	<b>F-1</b>
<b>G. Transport Canada Phased-In Approach to SMS Implementation.....</b>	<b>G-1</b>
<b>H. Draft Legislative Language for Protection of Aviation Safety Information.....</b>	<b>H-1</b>
<b>I. Example SMS Regulatory Language and D&amp;M Comments .....</b>	<b>I-1</b>

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## **SECTION 1: Introduction**

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This report contains the comments and high-level recommendations of the FAA Safety Management Systems Aviation Rulemaking Committee (SMS-ARC) Design & Manufacturing Working Group (D&M) for rulemaking in developing and implementing SMS requirements.

### ***1.1 SMS-ARC Background***

The Federal Aviation Administration (FAA) Order 1110.152 effective February 12, 2009 established the charter for a Safety Management Systems Aviation Rulemaking Committee (SMS-ARC) tasked to provide recommendations for rulemaking, processes, policies and guidance to FAA in developing and implementing broadly applicable SMS requirements for aviation service providers such as manufacturers, operators, repair stations, and training organizations. The FAA has appointed association representatives to serve as members of the SMS-ARC and named tri-chairs from a manufacturer, operator, and labor organization to best represent the broad industry that would be affected by an SMS rulemaking proposal. The SMS-ARC established working groups comprised of industry and government subject matter experts (SME) to provide recommendations, advice and guidance to the ARC in the areas of Design & Manufacturing, Operations & Training, and Maintenance. The SMS-ARC held a meeting on September 30 – October 1, 2009 to establish the working group tasking and deliverables.

### ***1.2 Design & Manufacturing Working Group Tasking & Report***

The SMS-ARC Design & Manufacturing Working Group (D&M) membership is comprised of a diverse group of individuals with expertise in aviation product safety and related subject matter areas representing organizations regulated under FAR Part 21 for the design and manufacture of type certificated aircraft and engines, approved avionics articles and systems, and association representatives on behalf of general aviation and modification and replacement part manufacturers; and contributors from the Federal Aviation Administration (FAA) Aircraft Certification Service (*Appendix A*).

The D&M was tasked by the SMS-ARC to develop a report which provides comments and high-level recommendations for rulemaking in developing and implementing SMS regulatory requirements (including minority position if required). The tasking statement required the D&M to complete the following:

- **Review Comments to SMS ANPRM** – Review public comments to the SMS ANPRM and develop a high-level summary of industry sector responses to identify key issues, concerns, and any recommendations regarding SMS requirements.
- **Perform Gap Analysis and Exceptions Assessment** – Perform a gap analysis between FAA Order 8000.367, Appendix B SMS requirements for service providers and current regulations and standards for Part 21 design and production approval holders. The analysis should identify the extent to which the intent of each requirement is met and can also identify potential exceptions where they may be impractical or not applicable for each type and/or size of certificate/approval holder organization.

- **Develop a Report on High-Level Recommendations for SMS Requirements** – With consideration of the gap analysis, exceptions assessment and ANPRM comments, develop a report which provides high-level recommendations for SMS requirements that address the following FAA questions:
  - Should the FAA issue regulations on SMS? Why or why not?
  - If so, who should SMS regulations apply to? Why and why not?
  - What should the SMS regulations address? (describe general concepts)
  - What should the guidance material address? (describe general concepts)
  - Explanation of the SMS-ARC working group recommendations
    - Justification (reasoning) for rule change
    - Explanation of benefits
    - Explanation of Costs
    - Harmonization with international standards

### **Review of Comments to SMS ANPRM**

The D&M reviewed the Safety Management System ANPRM Comment Summary prepared by the Regulatory Group (dated November 20, 2009) and developed a high-level summary of the design and manufacturing industry sector responses to identify key issues, concerns, and any recommendations regarding SMS requirements (*Appendix B*).

The majority of commenters in the design and manufacturing community expressed concern over the potential cost and resource burden of SMS regulatory requirements. Many organizations believe they already have robust internal safety programs and that SMS regulations could introduce a significant burden in administration and documentation, without providing a commensurate safety benefit. They suggested many approaches to mitigating this burden including conducting a gap analysis to existing regulations and ensuring that SMS requirements are kept at a high level, non prescriptive, and flexible to allow the use of existing safety systems and company processes in showing compliance. Also, SMS requirements must be scalable to accommodate small to large and simple to complex organizations and various business arrangements. In order to accomplish this, ANPRM commenters recommended pilot SMS implementation programs to develop experience with application of SMS to Design and Manufacturing organizations.

The commenters also expressed concern over protection of safety data, risk assessments and safety decisions from lawsuits and from loss of intellectual property rights and recommended that statutory protection would be required.

### **Gap Analysis and Exceptions Assessment**

The D&M performed a gap analysis between existing regulatory requirements for design and production approval holders and SMS requirements of both the ICAO SMS Framework and FAA Order 8000.367, Appendix B. Current Part 21 and airworthiness regulatory requirements regarding product safety address most SMS elements to various degrees. The greatest gaps between requirements exist with respect to organizational factors and SMS Safety Policy and Safety Promotion elements because FAA does not have organizational requirements for design approval holders like it does with Production approval holders, repair station certificates and air



carrier operating certificates. However, most design/production approval holder organizations have existing mature and effective safety systems and company processes that considerably exceed Part 21 regulatory requirements such as certification processes, quality management systems, internal audit quality assurance programs and continued operational safety programs.

The following appendices provide the D&M's gap analyses documents which includes side-by-side comparison along with comments representing an overall assessment of findings, the extent to which the intent of requirements are met, and exceptions where they may be impractical or not applicable:

*Appendix C:* Regulatory Gap Analysis – Executive Summary

*Appendix D:* Gap Analysis: Part 21 Design and Order 8000.367 Appendix B Requirements

*Appendix E:* Gap Analysis: Part 21 Manufacturing and ICAO SMS Framework Requirements

*Appendix F:* Gap Analysis: Extent to Which Part 21 D&M Addresses SMS Framework

### **D&M Report on High-Level Recommendations for SMS Requirements**

This report contains the comments and high-level recommendations of the D&M for rulemaking in developing and implementing SMS requirements. It was developed with consideration of the ANPRM comments and gap analyses summarized above. **Section 2 of this report provides the D&M's comments and high-level recommendations in response to the FAA questions.** Section 3 of this report provides a summary list of the high-level recommendations contained within the body of the report along with some additional recommendations on future tasks for the D&M necessary to support future development and implementation of SMS requirements for design and manufacturing organizations.

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## **SECTION 2: Comments in Response to FAA Questions**

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This section of the report provides the D&M's comments and high-level recommendations for SMS regulatory requirements structured in response to the following FAA questions:

- Should the FAA issue regulations on SMS? Why or why not?
- If so, who should SMS regulations apply to? Why and why not?
- What should the SMS regulations address? (describe general concepts)
- What should the guidance material address? (describe general concepts)
- Explanation of the SMS-ARC working group recommendations (justification, benefits, costs, harmonization with international standards)

### **2.1 Should the FAA issue regulations on SMS?**

FAA is considering new broadly applicable regulation that would require SMS for certain design and production certificate/approval holders and applicants. The SMS-ARC Design and Manufacturing Work Group (D&M) members recognize and endorse the foundational principles and concepts of SMS and consider them generally applicable to all civil aviation product and service providers, and in fact to any organization with safety risk exposure, and thus a need for effective organizational safety risk management. The D&M believes there is potential safety benefit to civil aviation and the air transportation system that could be realized as the result of consistent SMS requirements in the form of a single broadly applicable regulation.

With respect to applicability to Part 21 design and manufacturing organizations, the D&M believes that it is necessary for the FAA to implement SMS requirements that meet the ICAO Annex 8 SMS standard in order to support the global nature of U.S. aviation manufacturer activities and to facilitate reciprocal international acceptance of U.S. state of design and/or manufacturer SMS programs. However, the D&M has identified several key concerns for the design and manufacturing sector that must be addressed in order to achieve success from both a regulator and industry perspective, and to avoid unnecessary administrative burdens without commensurate safety benefit.

The D&M supports consideration of SMS requirements applicable to certain design and manufacturing organizations provided the following key issues are addressed:

- **International Harmonization and Reciprocal Acceptance** – The regulations should be harmonized internationally and there must be reciprocal acceptance of Safety Management Systems
- **Phased Promulgation of SMS regulations** – Promulgation of SMS rulemaking needs to be phased to provide for development of appropriate industry sector-specific requirements and applicability and development of necessary FAA guidance
- **Phased Implementation of SMS Requirements** – Regulations would accommodate phased implementation of SMS elements.
- **Recognize Existing Systems and Processes** – The regulations must provide for acceptance of existing effective safety programs and company processes which are already in place

- **Recognize Certification Procedures and Airworthiness Requirements** - Part 21 certification procedures and airworthiness requirements are prescribed by regulation and can not be changed by SMS requirements and processes
- **Scalability and Flexibility** – The regulations must accommodate a broad range of organizations from small parts manufacturers to large organizations holding multiple types of certificates/approvals and various business arrangements
- **Protection of SMS Safety Information** – There must be protection of safety information from disclosure and use for other purposes
- **FAA Plan for D&M Sector SMS Oversight Activity** – FAA must ensure sufficient planning and workforce training to accommodate efficient and timely assessment and oversight of SMS which is significantly different than current certification compliance activities
- **Alternatives to SMS Implementation Through Regulation** – FAA should consider alternatives to SMS implementation through regulation such as industry consensus standards and voluntary programs which may be more appropriate and effective for certain industry sectors

### **International Harmonization and Reciprocal Acceptance**

Many organizations in the design and manufacturing sector are affected by regulations of multiple State civil aviation authorities. Proliferation of multiple, slightly differing SMS standards could force organizations to accomplish redundant compliance demonstrations and to develop and maintain redundant documentation for compliance, all without benefit to system effectiveness. The D&M recommends that FAA work with ICAO and with other State regulatory authorities to ensure a coordinated and harmonized approach to implementation of SMS requirements to facilitate reciprocal acceptance of SMS programs of the State of design and State of manufacture. FAA should also update bilateral aviation safety agreements to include specific provisions regarding reciprocal acceptance of manufacturer SMS. This is necessary to prevent or minimize any unique, individual State regulatory differences that will drive costly compliance efforts with no measurable improvement in safety.

FAA SMS requirements should be consistent with the ICAO SMS framework to facilitate harmonization and reciprocal acceptance by aviation authorities throughout the world. The preamble of proposed SMS requirements should include discussions on how it meets or is equivalent to the ICAO SMS Framework, particularly where the language may be different.

### **Phased Promulgation of SMS Regulations**

The D&M recommends that new SMS requirements be adopted through phased rulemaking promulgation to build industry sector-specific experience and understanding and provide for the development of appropriate requirements and determination of appropriate applicability and phased implementation. Promulgation of new regulation should start with the basic SMS framework in a single new CFR Part along with appropriate FAR Part industry sector-specific requirements for initial applicability and implementation of SMS. The D&M recognizes that ICAO Annex 6 Part 1 required FAA to implement SMS for certain commercial air carriers by 2009 and that initial applicability would be most appropriate for Part 121 air carriers.

Subsequent rulemaking would include applicability in the other Annex 6 intended CFR Parts, including Parts 91, 135, 145, 142, etc.

ICAO, with technical support from national aviation authorities including FAA, invested several years developing SMS standards including a Safety Management Manual which provides guidance for the development and implementation of SMS requirements upon operating organizations such as air carriers, airports and air traffic providers. In addition, FAA Flight Standards has been working for years on SMS for operators including guidance information introducing SMS to operator organizations (AC 120-92, June 2006) as well as large scale pilot project implementation with several air carriers which have resulted in the development of detailed reference documents on an SMS Framework, SMS Implementation Guide, SMS Assurance Guide, and SMS Gap Analysis Tools for the development and implementation of SMS within an air carrier organization. There is a significant body of knowledge and practical experience regarding the development and implementation of SMS within an air operating organization that is very important in support of developing possible regulatory requirements. The D&M strongly recommends that FAA also work closely with design and manufacturing organizations through a pilot program to collaboratively develop a common understanding of how SMS could best be applied to support the development of appropriate requirements and implementation guidance.

Development of a Part 21 proposed rule requiring SMS applicability to certain design approval holders (DAH) and production approval holders (PAH) can not occur until FAA and industry have a better understanding of how SMS can be implemented within existing organizations and established processes in an effective and efficient manner. FAA Flight Standards pilot programs working with several air carriers and repair stations on voluntary implementation of SMS provided significant experience necessary to refine SMS standards and develop implementation tools and guidance for both industry and FAA. The D&M recommends that development of a proposed rule for applicability of SMS within Part 21 occur only after sufficient implementation experience within the design and manufacturing sector through an FAA sponsored pilot program, as well as development of workable sector-specific industry standards and FAA guidance material.

ICAO Annex 8 currently states that each State of design or manufacture shall require that an organization responsible for the type design or manufacture of aircraft implement a safety management system by November 2013. The need for phased promulgation of SMS requirements as discussed above means that it would not be practical nor even possible for the U.S. to meet this ICAO timeline. Considering the status of SMS requirements and implementation by other regulatory authorities such as EASA, the D&M believes that most ICAO member States will not be able to meet the 2013 date. D&M recommends that FAA work through ICAO to amend Annex 8 standards to establish an appropriate and realistic date for States' to implement SMS requirements for organizations responsible for the type design or manufacture of aircraft.

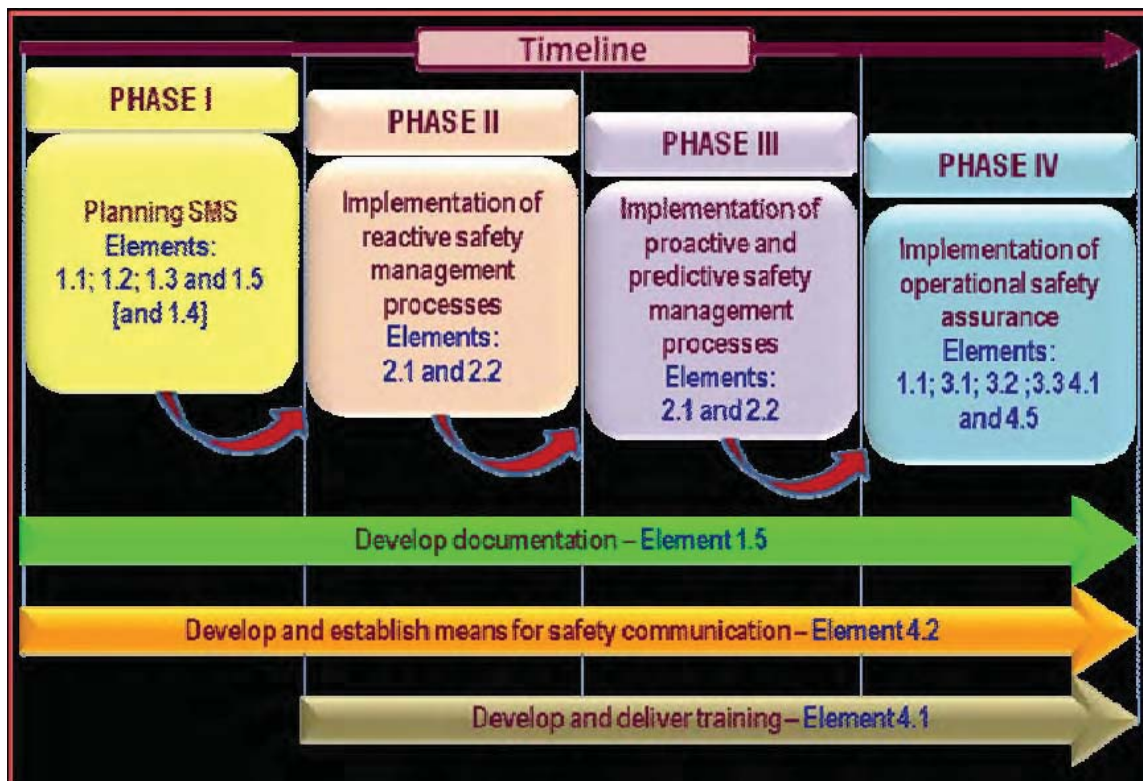
### **Phased Implementation of SMS Requirements**

Regulatory compliance expectations for certificate holders in all sectors should include reasonable time for phased implementation and increasing system maturity. Implementation phasing within design and manufacturing sector organizations should allow sufficient time to

avoid unnecessary resource burdens, and accommodate internal schedule limitations such as type certification programs and documentation revision cycles. System maturation should start with areas with the most potential leverage for safety improvement. For design and manufacturing organizations, the SMS should first address basic processes focused on product performance. For example, a robust continued operational safety process which would mature to include feedback of systemic corrections to the design process. Proactive or predictive efforts to address organizational or contributing factors as hazards in a design or manufacturing environment are more difficult to apply effectively since there is no direct correlation to product attributes, and no industry standard for application. This area requires additional industry study to enable effective, efficient implementation, and therefore should be addressed last.

The ICAO Safety Management System Manual (Chapter 10) provides the rationale and recommendations for implementing Safety Management Systems using a phased-in approach for the variety of SMS program elements. The graphic below summarizes the ICAO recommended phased-in approach. ICAO emphasizes that “the timeline for the implementation of each phase shall be commensurate with the size of the organization and complexity of the services provided.” Phased implementation of SMS requirements provides;

- a manageable series of steps to follow in implementing an SMS, including allocation of resources;
- effectively managing the workload associated with SMS implementation; and
- pre-empting a “ticking boxes” exercise.



The ICAO SMS Manual Chapter 10 and two related Appendices provide a detailed phased-implementation plan for SMS. Transport Canada has adopted the phased-in approach to implementing its SMS regulations which is summarized in *Appendix G*.

## **Recognize Existing Systems and Processes**

Many aviation design and manufacturing organizations have existing, mature and effective safety systems/programs and company processes such as Quality Management System (QMS), internal audit quality assurance programs, continued operational safety programs, and certification processes consistent with existing regulations. Implementation of SMS should complement and enhance those effective systems, and not add unnecessary burden that does not have commensurate safety benefit. The D&M Working Group conducted a gap analysis to assess existing regulations against the ICAO SMS framework and Order 8000.367, Appendix B which determined that existing Part 21 and airworthiness requirements for product safety address most SMS elements to various degrees. The following appendices provide the D&M's gap analyses documents which includes side-by-side comparison along with comments representing an overall assessment of findings, the extent to which the intent of requirements are met, and exceptions where they may be impractical or not applicable:

**Appendix C:** Regulatory Gap Analysis – Executive Summary

**Appendix D:** Gap Analysis: Part 21 Design and Order 8000.367 Appendix B Requirements

**Appendix E:** Gap Analysis: Part 21 Manufacturing and ICAO SMS Framework Requirements

**Appendix F:** Gap Analysis: Extent to Which Part 21 D&M Addresses SMS Framework

Many design and manufacturing organization's safety systems/programs and company processes considerably exceed the regulatory requirements and thereby provide a very solid foundation for efficient SMS implementation. SMS regulations and guidance for design and manufacturing organizations must be flexible enough to allow for the recognition of existing systems and company processes as acceptable methods of compliance to SMS requirements, to the maximum extent possible.

## **Recognize Certification Procedures and Airworthiness Requirements**

FAA must prescribe minimum standards required in the interest of safety for the design, material, construction, quality of work, and performance of aircraft, aircraft engines, and propellers (49 USC 44701). FAR Part 21 establishes procedural requirements for the issue of type certificates and design approvals (and changes to those certificates/approvals); the issue of production certificates and production approvals and rules governing the holders of these certificates/approvals. Part 21 also prescribes the designation of applicable regulations and minimum airworthiness standards for the issuance of a design approval within each product category (i.e. Parts 23 and 25 for airplanes, 27 and 29 for rotorcraft, 33 for engines, 35 for propellers, etc). This includes regulatory procedures for the establishment of special conditions and continuing airworthiness and safety improvements when the FAA finds that existing regulations do not contain adequate or appropriate safety standards. It would not be appropriate for an SMS to affect the applicability and acceptability of certification procedures and airworthiness requirements for the issuance of a design approval which have been established through public rulemaking and administrative procedures as this would be extremely burdensome, arbitrary and capricious. The D&M recommends that FAA clearly state that SMS can not change applicable regulatory requirements and the level of safety established in the regulations.

## **Scalability and Flexibility of SMS Requirements**

Any FAA regulatory and/or guidance material must be scalable to accommodate a broad range of organizations including small to large, multi-certificated organizations and various business arrangements. In addition, as discussed above on recognizing existing company safety systems/programs and processes, regulatory and guidance material must be flexible enough to allow company processes and “best practices” to support compliance with SMS requirements. To achieve this, the D&M believes the SMS regulatory language must necessarily be simple, efficient, non prescriptive and performance-based with a clear objective.

## **Protection of SMS Safety Information**

To enhance aviation safety by using safety risk management, there must be a free flow of safety ideas and information within certificate holders, between certificate holders and the authorities, and throughout the industry responsible for design, manufacture, maintenance and operation of aircraft.

The development, documentation and availability of safety ideas and information may be inhibited by

- threats of out-of-context exposure through the media
- threats of use of such data as admissions in criminal or administrative litigation
- threats of use of such data in civil litigation

Inhibition on the flow of safety information conflicts with the objectives of a safety management system. Among other things, this may result in warnings not to commit certain thoughts to writing or sharing of certain information, which may mean that important data is lost. This means that certain risks/hazards may not be pursued. In addition, the understanding of risk gained from concatenation of such data may not occur.

Implementation of a safety management system can only be successful if safety information is protected from inappropriate use. There is no SMS without the development, documentation and sharing of safety information. Protection is essential to ensure the availability of such information to enhance safety.

The D&M recommends that FAA seek to have Congress protect Safety Management Systems information from disclosure through discovery and/or FOIA in the United States. *Appendix H* provides sample legislative language for protection of aviation safety information which is modeled after 49 USC 1154 on discovery and use of cockpit and surface vehicle recordings and transcripts.

In addition, the D&M recommends that the FAA work through ICAO to expand ICAO Assembly Resolution on protecting safety data (Resolution A 35/17) to specifically include Safety Management Systems information.

## **FAA Plan for D&M Sector SMS Oversight Activity**

The FAA must ensure sufficient planning and capability to accommodate efficient and timely SMS regulatory compliance-finding activities for D&M sector organizations to meet implementation dates while continuing to support ongoing production and product certification activities, and continued operational safety activities. The implementation, assessment and oversight of an SMS for design approval holder organizations will be particularly challenging for both industry and FAA. The type certification process is a series of discreet showings and findings of compliance between the DAH applicant and FAA ACO (and its designees). FAA assessment and oversight of a systems approach to safety management will require a significant change in existing interaction processes between design applicants and FAA Aircraft Certification Offices as well as a cultural shift for the individuals involved.

FAA should develop training and guidance for FAA personnel involved in DAH/PAH SMS assessment and oversight to ensure that eventual SMS regulation, if adopted, does not result in unnecessary and undue regulatory compliance burden, and ensure implementation and oversight activity is efficient and equitable / fair so as not to interfere with competitive business models.

## **Alternatives to SMS Implementation Through Regulation**

The D&M recommends that FAA consider alternatives to SMS implementation through regulation such as industry consensus standards and voluntary programs which may be more appropriate and effective for certain industry sectors. One alternative would be implementation through a combination of (1) recognition of those elements of SMS already existing in the FAA regulations and (2) implementation of those elements missing from the existing regulations through a voluntary compliance system that would be audited under FAA guidelines (These missing elements have been identified by the D&M in the enclosed gap analysis). Such “missing elements” could be published as an industry standard that could be used as the basis for implementation of SMS standards with minimal FAA resource allocation.

The FAA has already relied in the past on accreditation schemes in order to implement programs designed to improve safety beyond existing standards. FAA §21.190 provides for the issue of a special airworthiness certificate for a light-sport category aircraft designed and manufactured to industry consensus standards (published by ASTM). The FAA’s AC 00-56A Voluntary Industry Distributor Accreditation Program is published in an advisory circular and not in the regulations. Compliance with the program is monitored by third party assessments, and is supplemented by popular programs like ASA-100 and ISO 9000 (AS 9100 is a corollary accreditation program for production quality management systems). By utilizing third party auditors who are subject to FAA oversight and industry standards subject to FAA approval, there have been improvements in aviation safety with a minimal implementation and oversight burden on industry and FAA.

There are numerous other examples voluntary programs that are effective without regulatory enforcement which have shown that voluntary guidelines can have a significant effect on an industry in order to promote change. And the benefit of these voluntary guidelines is that it is significantly easier to design a program that is targeted to meeting the program’s goals (like aviation safety improvement through risk-based assessments) when the system is flexible enough to permit the company to develop new ideas with the support of a government agency while minimizing regulatory compliance burden.



## **2.2 If so, who should SMS regulations apply to?**

The FAA, in conjunction with industry, must precisely determine the extent of new SMS requirements applicability in the design and manufacturing sector. In addition, new requirements must also address issues such as transition/grandfathering provisions for existing design certificate/approval holders of ‘orphaned’ aircraft, civil certificated aircraft in military service, out of production aircraft models, limited in service fleets as well as modifications and component/parts installed thereon. Properly scoped applicability provisions in the rule will significantly reduce the burden of implementation and oversight on both industry and FAA while maximizing the safety benefit of SMS. In addition, several questions were raised regarding FAA’s statutory legal authority and regulatory issues regarding imposition of new SMS requirements upon design organizations.

### **SMS Requirements Should Apply to Certain Design/Production Approval Holders**

The design and manufacturing industry sector includes a very broad range of private individuals and organizations that hold the following design and production certificates/approvals:

- Design Approvals
  - Type Certificates (TC) for aircraft, aircraft engines and propellers
  - Supplemental Type Certificates (STC) for changes to TC
  - Parts Manufacturing Approval (PMA) for modification and replacement parts
  - Technical Standard Order Authorization (TSOA) for articles (materials, parts, processes, or appliances) used on civil aircraft
- Production Approvals
  - Production Certificate (PC) for the manufacture TC/STC products and parts installed thereon
  - Parts Manufacturing Approval (PMA) for manufacture of modification and replacement parts
  - Technical Standard Order Authorization (TSOA) for manufacture of articles (materials, parts, processes, or appliances) used on civil aircraft

The D&M believes that SMS requirements should apply to certain design/production approval holders. However, the D&M considers that there are entities upon which imposition of SMS regulations would be ineffective or of limited benefit and overly burdensome. Because SMS implementation in the Design and Manufacturing sector is not yet well understood, and given the limited time available to respond to this initial tasking, the D&M is not able to provide a recommended definition or scope of those entities that SMS requirements should apply. SMS regulations pertaining to design and/or manufacturing organizations should not be promulgated unless and until the following issues related to applicability are resolved in collaboration with industry:

1. What are the criteria to be used for determination of whether an organization should be excluded from SMS requirements? Both industry and FAA must understand whether and how to impose SMS requirements on small organizations, organizations responsible for out-of-production aircraft or small fleet sizes, holders of Restricted Category Type Certificate(s), and aircraft used in commercial vs non-commercial operations.

2. For any organization subject to SMS regulation, how and using what criteria should SMS be scaled?
3. D&M does not recommend that SMS apply to suppliers/vendors that do not independently hold a certificate or approval.
4. Should FAA SMS regulations apply to a holder of a certificate or approval for a product used exclusively in military or other public use service?
5. What does “SMS interoperability” mean? How should SMS interoperability and flow of information be accomplished among organizations (some of which might not be required to have SMS) related to the same product, e.g., the manufacturer, suppliers/vendors to the manufacturer, operators, and maintainers of a product?

### **Statutory Legal Authority Issues: SMS Requirements Upon Design Organizations**

Several questions were raised regarding the FAA’s statutory legal authority to issue regulations imposing new SMS requirements upon design organizations that hold a Type Certificate or design approval. With respect to aviation organizations, the Statutes specifically direct FAA to prescribe regulations and minimum standards for the issuance of Production Certificates (PC), Design Organization Certificates (CDO), Air Carrier Operating Certificates, Airport Operating Certificates, and Air Agency Certificates for flight/maintenance schools and repair stations authorizing them with privileges to perform specified functions and to include “terms required in the interest of safety” [49 USC 44702, 44704-44707]. Therefore, FAA clearly has statutory legal authority to issue regulations imposing new requirements upon these certificated production, design, air carrier, and repair station organizations.

However, current statutes do not require the applicant for or holder of a type certificate or design approval to meet any “terms required in the interest of safety” nor any minimum technical or organizational qualification or criteria. As such, FAA regulations state that any interested person may apply for (21.13) and is entitled to (21.21) a type certificate if the product design meets the applicable airworthiness requirements and that it may be transferred to any other person (21.47). Therefore, current holders of type certificates or design approvals include a very broad range of aviation manufacturers as well as non-aviation organizations (i.e. trusts, banks, insurance companies, law firms) and private individual persons who may not be a design organization nor exercise the privileges of the type certificate. Therefore, several questions remain regarding the FAA’s statutory legal authority to issue regulations imposing new SMS requirements upon holders of a Type Certificate or design approval that may not be a design organization and whether retroactively imposing new SMS requirements upon such existing holders would be arbitrary and capricious because it would essentially require them to surrender their type certificate or design approval and intellectual property rights.

FAA has not yet promulgated regulations implementing its statutory authority to issue Design Organization Certificates (CDO) which would be applicable to organizations seeking privileges to certify compliance with requirements and minimum standards for the issuance of a TC. The FAA CDO-ARC provided recommendations to FAA for the establishment of CDO which includes SMS as a core requirement.

**Regulatory Issues: SMS Requirements Upon Design Organizations**

Several questions were raised whether the existing Part 21 regulatory structure allows for the practical implementation of new SMS requirements upon design organizations that hold a Type Certificate or design approval. Current Part 21 regulations allow any person to hold a type certificate, without stipulating management structure or organization requirements. Type certification addresses product definition and compliance with airworthiness standards, but does not establish any minimum requirements for the holder of a type certificate. However, there are examples of current regulations which impose requirements upon the applicant and holder of a type certificate/design approval that could serve as a model for prescribing new SMS requirements. These include §21.3, §21.50, §21.99 and Part 26 requirements which are discussed in the table below.

Another model for application of SMS requirements upon certain design approval holders is for FAA to establish minimum requirements for design organizations and formal recognition and oversight through the issuance of design organization certificate (CDO) or approval. A CDO-ARC has submitted recommendations to FAA for the establishment of a CDO with minimum standards for organizational management systems, capability and documented procedures including a specific requirement for SMS. However, application for CDO would be strictly voluntary for those design organizations that meet the minimum requirements and believe it would provide a benefit commensurate with the additional regulatory burden.

From an international perspective, both EASA and Transport Canada have prescribed regulatory requirements for applicants and holders of type certificates/design approvals establishing minimum standards for the design organization’s procedures and capability and that any new SMS requirements would be applicable to these approved design organizations.

The following table provides a summary of different approaches that could be considered for the application of any proposed new SMS requirements upon design and production organizations.

<b><u>Applicability</u></b>	<b><u>Requirement</u></b>	<b><u>Pros/Cons</u></b>
Type Certificate	<ul style="list-style-type: none"> <li>▪ SMS as an airworthiness requirement and condition for continued eligibility</li> <li>▪ Part 39 Airworthiness Directive</li> <li>▪ Part 26 retroactive requirements for continued airworthiness and safety improvement</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pro: none</li> <li>▪ Con: Can not apply management system organizational requirements to a design approval</li> </ul>
Holder of a TC	<ul style="list-style-type: none"> <li>▪ 21.3 reporting of failures, malfunctions and defects</li> <li>▪ 21.50 make ICA and changes thereto available (only applicable to TC for which application was made after January 1981)</li> <li>▪ 21.99 required design changes (airworthiness requirement to maintain eligibility of TC required when AD is issued)</li> <li>▪ Part 26 retroactive requirements for continued airworthiness and safety improvement (airworthiness</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pro: Holders are readily identifiable for each TC</li> <li>▪ Con: Holders can be any person, no requirements for organization or capability or documented procedures</li> <li>▪ Con: These are airworthiness applicable to design approvals which the holder must perform in order to maintain the eligibility of the design approval</li> </ul>

<b>Applicability</b>	<b>Requirement</b>	<b>Pros/Cons</b>
	requirement to maintain eligibility of TC required when rule is promulgated)	
Certified Design Organization (CDO)	<ul style="list-style-type: none"> <li>▪ Current statutes authorize FAA to issue CDO</li> <li>▪ CDO-ARC recommendations include SMS as core requirement</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pro: Defined design organization with minimum standards for organization and capability and documented procedures</li> <li>▪ Con: CDO not yet established in Part 21 and is voluntary</li> </ul>
Approved Design Organization Concept (EASA and TCCA)	<ul style="list-style-type: none"> <li>▪ Approach used by other international aviation authorities to formally recognize design organizations and prescribe minimum standards and requirements including application of SMS</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pro: Defined design organization with minimum standards for organization and capability and documented procedures</li> <li>▪ Con: Not specifically authorized in statutes and not yet established in Part 21</li> </ul>
Impose requirement indirectly on design approvals through 14 C.F.R. 21.137	<ul style="list-style-type: none"> <li>▪ Production approval holder's quality system would be required to interface with design approval for SMS purposes</li> <li>▪ 21.137(a) requires the production approval holder to control the design data and changes</li> <li>▪ 21.137(m) requires coordination with design approval on in-service feedback, design changes and ICA update</li> </ul>	<ul style="list-style-type: none"> <li>▪ Pro: Production approval holders meet organizational requirements capable of supporting SMS</li> <li>▪ Pro: PC, PMA, and TSOA will meet 21.137 as the common basis for their production quality systems</li> <li>▪ Pro: Expects design approvals that are not associated with an active production approval at the time that the regulation is promulgated (<i>de jure</i> grandfathering of inactive TCs)</li> <li>▪ Con: FAA regulation of design approval holder would be indirect (through the PC/PMA/TSOA)</li> <li>▪ Con: Would only apply to products still listed on a production certificate</li> <li>▪ Con: Would not apply to applicants for new design approval</li> </ul>

## **2.3 What should the SMS regulations address?**

Initial rulemaking should provide a high-level overarching requirement for SMS, at a similar level of detail to the ICAO SMS framework while ensuring the language is applicable to all industry sectors. Once experience has been gained of the applicability of SMS to the design and manufacturing industry sectors, based on pilot programs, rulemaking should then proceed for Part 21 industry-specific applicability of SMS requirements.

### **Aviation Safety vs. Workplace Safety**

The scope of SMS requirements should be limited to hazards associated with the operation of an aircraft or that could affect the safety of aircraft operations. Such a hazard is a condition that can lead to death or serious injury or substantial damage to an aircraft during aircraft operations with the intention of flight. It is not simply any hazard that can lead to injury, illness or death to people; damage to or loss of a system, equipment, or property; or damage to the environment.

### **Non-Prescriptive and Performance Based (ICAO SMS Framework Level)**

The D&M WG agrees with FAA's vision that the most efficient approach to regulation would be a single new overarching regulatory standard eventually applicable to all intended certificate holders (as addressed below). The single rule approach would promote consistent requirements for multi-certificated organizations, as well as encourage interoperability between SMSs of organizations in the various sectors.

To achieve success with this approach, the regulatory language must necessarily be simple, efficient, non prescriptive and performance-based with a clear objective. The best approach would be to ensure that the proposed new CFR Part be consistent with framework-level language, fully aligned with ICAO Standard(s). The D&M believes that FAA Order 8000.367, Appendix B contains a level of detail that would be inappropriate for an overarching SMS regulation and recommends that the WG be tasked to provide specific comments to FAA.

The D&M Work Group reviewed examples of proposed or published Safety Management System regulatory language from TCCA, EASA, Australia, and Singapore as well as recommendations from the CDO-ARC and a generic sample of regulatory language based on the ICAO SMS Framework as background and reference for development of proposed FAA regulatory language. Each example was evaluated from the perspective of perceived strength and/or weakness as potential candidate language for a proposed single overarching regulation based on the following considerations: alignment with ICAO framework, simplicity efficiency and flexibility non-prescriptive and performance-based, and enforceability (*Appendix I*).

## **2.4 What should the guidance material address?**

The following addresses guidance material specifically intended for application to design and manufacturing organizations, whether published with guidance applicable to other sectors or separately. This discussion should be considered as equally applicable to FAA Orders in terms of findings of compliance and ongoing oversight. Guidance for those responsible for oversight must be consistent with guidance for product and service providers.

Guidance material must clearly describe how compliance might be shown with SMS requirements. Guidance material must be prepared that addresses each SMS requirement. The guidance must be clear enough that the applicant will know whether its implementation will be considered acceptable, and that the same finding of compliance or non-compliance would be provided by any FAA evaluator and any FAA region. It must allow flexibility for applicants to use existing systems and processes to the fullest extent possible. For example, an organization's existing Quality Management System (QMS), Continued Operational Safety Program, or certification processes might already embody all of the SRM processes that might be required by SMS regulations. Such an organization's processes should explicitly be accepted as satisfying some or all, as the case may be, SRM requirements. The following are some specific areas where guidance will be needed. An FAA pilot program implementing SMS within the Design and Manufacturing community is needed to promote an understanding of how SMS would apply and would provide information necessary toward the development of guidance in these areas.

1. SMS introduces organizational and behavior performance concepts as requirements in addition to traditional product oriented safety risk management processes. Those concepts include:
  - a. Identification of hazards associated with organizational factors, including human performance within an organization
  - b. Qualitative SRM of those hazards
  - c. Continuous improvement of SMS processes
  - d. Imposition of organizational process requirements related to products, e.g., on the holder of a type certificate

These concepts must not be embodied as regulatory requirements unless and until FAA and industry together come to a clear understanding of how compliance might be shown, and how enforcement might be accomplished. The guidance material must identify the specific features or characteristics that must be present to constitute an acceptable SMS. However, there is limited experience with application of these concepts to D&M organizations and that guidance will be updated over time to incorporate additional information.

2. Guidance material or the rule itself must enable an organization to determine whether it is required to implement an SMS.
3. Guidance is needed to provide a common understanding and detailed methods of compliance for SRM and SA processes appropriate to the range of DAH organizations and products. AC 39-8 on continued airworthiness assessments of powerplants and auxiliary powerplant installations in transport category airplanes is an existing example of such guidance. The success of AC 39-8 depended upon having a pilot program across the propulsion community, and having a common data-set upon which to base

assessments of new risks. It is recommended that a pilot program (perhaps of some years' duration) be used in the Design and Manufacturing community before SMS rule implementation, to promote understanding of how SMS would apply. Such a pilot program might include compilation of industry safety data (similar to the CAAM reports) to enable the use of common assumptions and hazard classifications. Guidance is also needed for how PAH would accomplish SRM and SA.

4. Guidance material must clearly explain or define the extent to which hazard identification must be accomplished in order to show compliance. FAA evaluation of an SRM process must be limited to its relationship to hazards credibly associated with the operation of an aircraft, or that could affect the safety of aircraft operations.
5. Order 8000.367 Chapter 3 specifies, "AVS must define acceptable and unacceptable levels of safety risk," and Appendix B, section 5 specifies, "The organization must define acceptable and unacceptable levels of safety risk." Guidance material (and/or the rules themselves) must clearly define the meaning of "acceptable and unacceptable levels of safety risk," and explain how an organization might show compliance with a requirement to establish those levels. The guidance material must provide guidance on how to develop procedures and must also provide guidance on the objective standards to which the risks will be compared. The objective standards need to be consistent across the industry and repeatable.
6. Guidance material (and/or the rules themselves) must explain the concept of SMS scalability related to organizational size and complexity, and how an SMS might be appropriately scaled. The material should address such situations as "orphan" type certificates, out-of-production products, or an inactive type certificate held by a single individual.
7. Guidance material (and/or the rules themselves) must identify requirements, criteria, and methods used to establish SMS interoperability (as discussed in Order 8000.367).
8. Guidance material must identify an appropriate SMS implementation schedule, such as phased implementation, that may be used by an organization. Consistent with international implementation schedules in the operations sector, phasing should provide for initial implementation of reactive processes aimed at aircraft-level hazards. Proactive and organization-level processes should not be required until additional understanding of SMS in design and manufacturing organizations is obtained. Examples of phased implementation of SMS requirements which can be evaluated as models for D&M are available from AC 120-92, ICAO SMS Manual and Transport Canada.
9. Guidance material must address acceptable means for holders of multiple certificates (such as a manufacturer holding Type Certificate(s), STC, design approvals, a Production Certificate, and Repair Station Certificate(s)) to allow for integration of a single SMS across the organization that holds those certificates.
10. Guidance material must identify the marking requirements necessary to identify safety information subject to statutory protection from disclosure and misuse, such as records of risk assessments and safety decisions. It would be helpful for the guidance material to identify FAA expectations (type and format of data, who has access, etc.) as well as the

extent of protection afforded. This, of course, presupposes the existence of statutory protection for safety data. It is crucial that such protection be in place; without it, safety data is not likely to be shared.

11. Guidance material on demonstrating the ongoing effectiveness and performance of SMS.
12. Guidance material must identify how a party may demonstrate compliance to certain elements of the SMS requirements through implementation of certain industry consensus standards. Industry Standards like AS 9100 and the MARPA Continued Operational Safety System include elements of SMS. By verifying compliance to those standards in accordance with FAA guidance, the SMS party may demonstrate compliance to the related elements of SMS. FAA guidance should indicate the procedures for acceptance of industry standards, and the process for identifying which elements of SMS are addressed by each industry standard.



## **2.5 Explanation of the SMS ARC recommendations**

- Justification (reasoning) for rule change
- Explanation of benefits
- Explanation of costs
- Harmonization with international standards

### **Justification (reasoning) for rule change**

If ICAO has a standard in Annex 8 requiring organizations responsible for the type design or manufacture of aircraft to have an SMS then it is necessary for the FAA to have SMS regulations that are inline with the ICAO standard to facilitate reciprocal acceptance by other ICAO signatory authorities of the U.S. state of design or manufacturer SMS. Without an FAA recognized SMS, a manufacturer of aircraft might have to demonstrate compliance with potentially conflicting SMS requirements of each non-U.S. authority for which they hold a type certificate which would be burdensome and reduce the overall benefit of SMS. The above provides the primary justification for regulation of SMS for design and manufacturing organizations.

The SMS-ARC Design and Manufacturing Working Group recognizes that not all organizations associated with civil aviation are effectively managing all their safety risks and that SMS regulations can have a positive influence on the overall safety of civil aviation. However, there are many organizations that are effectively managing their contribution to aviation safety and we want to ensure that the implementation of SMS regulations does not diminish or detract from those effective safety program. The SMS-ARC Design and Manufacturing Working Group also recognizes that with proper implementation of SMS regulations even those effective safety programs can also be enhanced.

The SMS-ARC Design and Manufacturing Working Group members believe there would be potential safety benefit to civil aviation and the air transportation system if a consistent set of SMS regulations were promulgated. However, the D&M has identified several key concerns for the design and manufacturing sector that must be addressed in order to achieve success from both a regulator and industry perspective, and to avoid unnecessary administrative burdens without commensurate safety benefit. The D&M supports regulation of SMS for certain design and manufacturing organizations provided the following key issues are addressed:

- **International Harmonization and Reciprocal Acceptance** – The regulations should be harmonized internationally and there must be reciprocal acceptance of Safety Management Systems
- **Phased Promulgation of SMS regulations** – Promulgation of SMS rulemaking needs to be phased to provide for development of appropriate industry sector-specific requirements and applicability and development of necessary FAA guidance
- **Phased Implementation of SMS Requirements** – Regulations would accommodate phased implementation of SMS elements.
- **Recognize Existing Systems and Processes** – The regulations must provide for acceptance of existing effective safety programs and company processes which are already in place

- **Recognize Certification Procedures and Airworthiness Requirements** - Part 21 certification procedures and airworthiness requirements are prescribed by regulation and can not be changed by SMS requirements and processes
- **Scalability and Flexibility** – The regulations must accommodate a broad range of organizations from small parts manufacturers to large organizations holding multiple types of certificates/approvals and various business arrangements
- **Protection of SMS Safety Information** – There must be protection of safety information from disclosure and use for other purposes
- **FAA Plan for D&M Sector SMS Oversight Activity** – FAA must ensure sufficient planning and workforce training to accommodate efficient and timely assessment and oversight of SMS which is significantly different than current certification compliance activities
- **Alternatives to SMS Implementation Through Regulation** – FAA should consider alternatives to SMS implementation through regulation such as industry consensus standards and voluntary programs which may be more appropriate and effective for certain industry sectors

### **Explanation of Benefits**

Potential benefits of an ‘ideal’ implementation at a D&M organization include the following:

- **International recognition and mutual acceptance**
  - International recognition of an FAA SMS certification would allow mutual acceptance or recognition by non-U.S. regulatory authorities of the U.S. type certificate holder’s SMS, assuming the non-U.S. authority required the type certificate holder to have an SMS.
- **Safety data driven rulemaking by FAA and other aviation authorities**
  - With “ideal” implementation comes effective sharing of trusted safety information with regulators. Such sharing likely would tend to promote appropriate regulatory actions, such as airworthiness directives, airworthiness standards, organizational requirements, decisions to add/delete regulations, etc.
- **Streamlined processes and improved process capability**
  - Provided that the implementation does not have the effect of adding layers of compliance
  - SMS adds focus on the assessment and improvement of the organization’s capabilities and procedures beyond the current system, which requires FAA to analyze independently the safety implications of new and modified designs.
  - Process enhancements may include:
    - Adopting a data driven approach (similar to system safety) to enhancing safety. This includes the collection and accessibility of data (internal and external) to support better decision-making and proactive identification of safety issues upstream before accidents occur
    - Using a risk based approach so that resources are best allocated to support those activities which will achieve the greatest safety benefit;

- Better integration of safety processes and end-to-end oversight of safety issues to ensure that safety issues discovered are properly dealt with and “closed” (or completed) regardless of where or by whom they are discovered
- **Improved Organizational Decision-making**
  - An effective safety management system can potentially provide design and/or production organizations with a consistent set of standards to manage continued airworthiness, and to transfer the safety knowledge gained from lessons learned into future designs.
  - For organizations holding multiple certificates, an integrated safety management approach may be an effective way to collect and analyze hazard information and determine the most appropriate way to implement risk controls.
  - Identification of hazards, the analysis and assessment of the associated risk can lead to the development and implementation of appropriate risk controls, improving product safety. If more analytical assessment techniques, similar to AC 39-8, are adopted more appropriate expenditure and timeliness of necessary corrective actions can be made.
  - Understanding what presents the greatest risk and what needs to be addressed
  - With appropriate regulatory guidance, safety management system will ensure a broader focus of potential hazards are considered in an organization when making decisions and hence potentially reduce risk.
  - Providing decision-makers with a solid defense in support of decisions;
- **Proactive Management of Safety**
  - An effective safety management system will ensure the organization continuously evaluates the effectiveness of their risk control measures
  - Early identification and continuous control of safety hazards to prevent accidents from occurring
- **Safety Promotion**
  - Effective promotion of SMS will encourage employees to report and engage in the safety decision making process.

## **Explanation of Costs**

The costs of an SMS regulation are driven by the details of the requirements and implementation, and are difficult to assess until the details are fully understood. If the requirements are prescriptive, do not allow full use of existing safety systems and require an all-encompassing risk analysis process (including comprehensive hazard identification, full human error risk analysis and mitigation, organizational risks and unbounded proactive risk research), then costs will be prohibitively high.

If requirements are kept at a high level, allowing considerable discretion by the organization in how they meet the requirement, and if existing internal safety systems can be used in showing compliance, and if risk analysis activity can be prioritized to address the highest risks, then costs would be very much lower.

As an example, cost estimates for SMS implementation were conducted by one large manufacturer using the high level ICAO requirements, and compared to the estimated costs for a partial implementation of Appendix B. The detailed analysis for partial implementation of Appendix B was submitted to the Docket in response to the ANPRM. The results are shown in the table below. Additional bounding of the requirements could drive costs significantly lower than those shown in the table. In addition, the commenter noted that costs, robustness of analyses and ease of oversight would all be greatly benefited if the industry were to pool data on hazards, as was done by the propulsion industry in the CAAM process.

	<b>Initial (non recurring) cost \$MM</b>	<b>Annual recurring cost \$MM</b>
<b>ICAO SMS Framework</b>	9	25
<b>Appendix B (partial implementation)</b>	107	22

### **Harmonization with International Standards**

Many organizations in the design and manufacturing sector are affected by regulations of multiple State civil aviation authorities. Proliferation of multiple, slightly differing SMS standards could force organizations to accomplish redundant compliance demonstrations and to develop and maintain redundant documentation for compliance, all without benefit to safety. The FAA must work with ICAO and other State civil aviation authorities to establish harmonization of SMS regulation, or reciprocal acceptance of a service provider regulatory compliance finding made by a single authority.

SMS interoperability will also require the flow of information between suppliers and customers in different states, and between organizations and regulators in different states. If a single industry-standard process and format can be used, tailored to comply with all export laws, this will avoid multiple reporting of the same data in several slightly different formats required for different authorities or customers. It is recommended that industry be tasked to develop such a standard in coordination with ICAO.

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## **SECTION 3: Summary of D&M Recommendations**

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### **3.1 Recommendations in Response to FAA Questions**

The following is a summary list of D&M recommendations which are excerpts taken directly from discussion Section 2 of this report on comments in response to FAA questions and includes a reference to the page number where the recommendation is made:

- The D&M recommends that FAA work with ICAO other State regulatory authorities to ensure a coordinated and harmonized approach to implementation of SMS requirements to facilitate reciprocal acceptance of SMS programs of the State of design and State of manufacture. [6]
- The D&M recommends that new SMS requirements be adopted through phased rulemaking promulgation to build industry sector-specific experience and understanding and provide for the development of appropriate requirements and determination of appropriate applicability and phased implementation. [6]
- The D&M strongly recommends that FAA also work closely with design and manufacturing organizations through a pilot program to collaboratively develop a common understanding of how SMS could best be applied to support the development of appropriate requirements and implementation guidance. [7]
- The D&M recommends that development of a proposed rule for applicability of SMS within Part 21 occur only after sufficient implementation experience within the design and manufacturing sector through an FAA sponsored pilot program, as well as development of workable sector-specific industry standards and FAA guidance material. [7]
- D&M recommends that FAA work through ICAO to amend Annex 8 standards to establish an appropriate and realistic date for States' to implement SMS requirements for organizations responsible for the type design or manufacture of aircraft. [7]
- The D&M recommends that FAA clearly state that SMS can not change applicable regulatory requirements and the level of safety established in the regulations. [9]
- The D&M recommends that FAA seek to have Congress protect Safety Management Systems information from disclosure through discovery and/or FOIA in the United States. [10]
- the D&M recommends that the FAA work through ICAO to expand ICAO Assembly Resolution on protecting safety data (Resolution A 35/17) to specifically include Safety Management Systems information. [10]
- The D&M recommends that FAA consider alternatives to SMS implementation through regulation such as industry consensus standards and voluntary programs which may be more appropriate and effective for certain industry sectors. [11]
- The D&M recommends that the SMS-ARC task the D&M to provide a review of Order 8000.367 Appendix B SMS requirements and to develop an appropriate definition of a "hazard" in order to support FAA pilot program with design and manufacturing organizations. [25]

## **3.2 Recommendations for Next Steps**

The D&M strongly recommended that FAA also work closely with design and manufacturing organizations through a pilot program to collaboratively develop a common understanding of how SMS could best be applied in an effective and efficient manner. This is the only way to develop sufficient implementation experience to support the establishment of appropriate SMS regulatory requirements, applicability scope to certain design and production approval holder organizations, and development of implementation guidance, tools and policy for both industry and FAA. The D&M recommends that the SMS-ARC task the D&M to provide a review of Order 8000.367 Appendix B SMS requirements and to develop an appropriate definition of a “hazard” in order to support FAA pilot program with design and manufacturing organizations.

### **Review of SMS Requirements in Order 8000.367, Appendix B**

The D&M supports a single new overarching SMS regulatory standard which would eventually be applicable to certain design/production approval holders. The single rule approach would promote consistent requirements for multi-certificated organizations, as well as encourage interoperability between SMSs of organizations in the various sectors. To achieve success with this approach, the regulatory language must necessarily be simple, efficient, non prescriptive and performance-based with a clear objective. As stated previously in this report, the D&M believes that FAA Order 8000.367, Appendix B contains a level of detail that would be inappropriate for an overarching SMS regulation and recommends that the WG be tasked to provide specific comments to FAA. The D&M requires additional time to discuss Appendix B requirements in more detail in order to provide FAA with specific comments and justification for this position.

### **Definition of “Hazard” in Design and Manufacturing Environment**

The definition of “Hazard” in the current ICAO guidance as well as in FAA Order 8000.367 may be sufficiently detailed in the context of flight operations and for application in an air carrier’s SMS, but requires more specific translation to allow applicability as part of a proposed SMS regulatory mandate for the design and manufacturing sector. The definition from FAA Order 8000.367 is reproduced for reference:

*“Hazard - Any existing or potential condition that can lead to injury, illness or death to people; damage to or loss of a system, equipment, or property; or damage to the environment. A hazard is a condition that is a prerequisite to an accident or incident.”*

In the areas of aviation product design and continued operational safety, identification of product-related hazards and the effective management of the associated risks are activities that are fundamental and well understood. However, the starting point and necessary prerequisite for accomplishment of a safety risk analysis in terms of likelihood of occurrence and severity of effects is the identification of a specific existent or postulated condition of the product. Under the safety risk management (SRM) component of an SMS, and utilizing the existing hazard definition, a design organization could potentially be expected to evaluate an essentially infinite set of existing or potential conditions involving the organization, personnel, facilities, analytical tools/capabilities and so forth. While these factors could potentially affect the product design, there is no direct correlation any product attribute, and therefore no capability for traditional

evaluation in terms of likelihood of occurrence or severity of effects. It would therefore be impractical or impossible for a design organization to fully comply with the SMS requirements as written in 8000.367 Appendix B. Additional work will be required to develop more specific definitions and guidance for applicability to design and manufacturing activities.

## **SECTION 4: APPENDICES**

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### **Table of Contents**

- APPENDIX A.** SMS-ARC D&M Members
- APPENDIX B.** Summary of ANPRM Comments from D&M industry sector
- APPENDIX C.** Regulatory Gap Analysis – Executive Summary
- APPENDIX D.** Gap Analysis: Part 21 Design and Order 8000.367 Appendix B Requirements
- APPENDIX E.** Gap Analysis: Part 21 Manufacturing and ICAO SMS Framework
- APPENDIX F.** Gap Analysis: Extent to Which Part 21 D&M Addresses SMS Framework
- APPENDIX G.** Transport Canada Phased-In Approach to SMS Implementation
- APPENDIX H.** Draft Legislative Language for Protection of Aviation Safety Information
- APPENDIX I.** Example SMS Regulatory Language and D&M Comments



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**APPENDIX A: SMS-ARC Design & Manufacturing (D&M)  
Working Group Membership List**

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<u>Last Name</u>	<u>First Name</u>	<u>Organization</u>	<u>Membership Status</u>
Desrosier	Walter	GAMA	D&M Lead and ARC
Johns	Tom	Boeing	D&M and ARC Tri-Chair
Dickstein	Jason	MARPA & AEA	D&M and ARC
Mahone	Bruce L.	SAE	D&M and ARC
Bartron	Michael	Pratt & Whitney	D&M
Beck	Anthony	Gulfstream Aerospace Corp	D&M
Cummins	Mike	Honeywell Engines & Systems	D&M
Durkin	Chris	Honeywell Avionics	D&M
Jette	Helynn	Bombardier Aerospace	D&M
Kerr	John S.	Bell Helicopter Textron Inc.	D&M
Kihm	Doug	Boeing	D&M
Knife	Sarah	GE Aviation	D&M
Picou	Gary	PS Engineering, Inc.	D&M
Thompson	Dean	Hawker Beechcraft Corp.	D&M
Welch	William (Buck)	Cessna Aircraft Company	D&M
Williams	Rex	Bombardier Learjet	D&M
Reinert	Mike	FAA-AIR	D&M FAA Support
Huber	Chuck	FAA-AIR	D&M FAA Support
Navarro	Linda	FAA-AIR	D&M FAA Support

## APPENDIX B: Summary of comments to SMS ANPRM

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The D&M reviewed the Safety Management Systems ANPRM Comment Summary prepared by the Regulatory Group (dated November 20, 2009) and developed a high-level summary of the design and manufacturing industry sector responses to identify key issues, concerns, and any recommendations regarding SMS requirements.

### Compilation Summary of Comments to SMS ANPRM

The majority of commenters in the Design and Manufacturing community expressed concern over the potential cost and resource burden of SMS. Many believe they already have robust internal safety programs and that SMS regulations would introduce a significant burden in administration and documentation, without providing a commensurate safety benefit. They suggested many approaches to mitigating this burden including:

- conducting a gap analysis to existing regulations or requirements,
- by keeping SMS requirements at a high level and non prescriptive, and
- flexible to allow the use of existing systems in showing compliance,
- scalable to accommodate small to large and simple to complex organizations, and able to
- accommodate various business arrangements.

A phased approach with pilot programs was suggested to develop experience with application of SMS to Design and Manufacturing organizations. The commenters also expressed concern over protection of safety data, risk assessments and safety decisions from lawsuits and from loss of intellectual property rights; statutory protection was requested.

### Excerpt Summary of Comments to SMS ANPRM

The following provides a summary of comments to the SMS ANPRM categorized by the Regulatory Group as coming from design, manufacturing and maintenance organizations only (Air Carrier and Training comments are not addressed herein. Some comment attributions may have been omitted by mistake). The reference numbers provided following each set of comments identifies the specific commenter from the docket. This provides a general indication of the number of commenters that support a particular position and traceability in the event a commenter wishes to understand how their response to the ANPRM was considered by the D&M in this report.

**DM1** Many companies stated that they already have robust internal safety programs. Many commenters expressed concern over the potential cost and resource burden entailed in showing compliance with SMS requirements. (8.1, 16.1, 20, 21.1, 24.1, 25.1, 26.1, 30.1, 31.1, 32.1, 33.1, 34.1, 39.1, 48.1, 53.1, 57.1, 63.1, 80.1, 88.1, 89.1) . One commenter (a private individual) requested that cost not be considered.

It was pointed out that this cost and resource burden could detract from existing safety systems and processes. (57.1, 80.1, 35.1, 62.1, 25.1, 21.1, 33.1, 49.1, 32.1).

Some commenters said that they had found SMS tools to be helpful in cost savings or reducing quality escapes. (77, 72.1, 63.1)

**APPENDIX B: Summary of Comments to SMS ANPRM**

**DM2** Many commenters stated that SMS elements duplicate existing internal processes or existing regulatory requirements, especially existing type certification processes for the design sector and QMS processes and requirements for the manufacturing and maintenance sectors. (57.1, 68.1, 20, 62.1, 25, 72.1, 50.1, 17.1, 19.1, 35.1, 53.1, 58.1, 75.1, 10.1, 25.1, 34.1, 21.1, 24.1, 32.1, 33.1, 36.1, 39.1, 63.1, 77, 44.2, 85.1, 70.1, 49.1, 24.1, 88.1, 19.1)

**DM3** SMS was perceived as imposing a significant bureaucratic/documentation burden; doubt was expressed that it would result in a commensurate safety benefit. (24.1, 32.1, 75.1, 10.1, 21.1, 36.1, 39.1, 26.1, 34.1, 8.1, 33.1, 63.1, 25.1, 19.1, 88.1, 16.1, 26.1, 39.1).

**DM4** Some commenters, especially the engine community which has a very strong, formalized COS process in place via AC39.8, did not believe that SMS would improve compliance with the CFRs. (17.1, 35.1, 62.1, 88.1, 72.1, 25.1, 75.1, 21.1, 24.1, 63.1). A few airplane-community commenters believed it would be helpful to them in Continued Operational Safety programs (53.1, 49.1)

**DM5** The following approaches to mitigating the burden were proposed (in no special order):

- Phased implementation (57.1, 89.1, 79.1, 35.1, 72.1). Commenters noted that the air carrier implementation of SMS is much further ahead than that of Design, Maintenance + Manufacturing sectors, and that developing a common understanding of applicability should precede levying requirements on Design, Maintenance + Manufacturing.
- Gap analysis comparing SMS to existing regulations or requirements (44.2, 51.1, 25, 53.1, 34.1, 8.1, 38.1, 68.1, 62.1, 50.1, 72.1, 25.1, 39.1, 44.2, 70.1, 25.1, 58.1, 77, 19.1). It was suggested that SMS requirements not duplicate existing requirements, or that the MOC for existing requirements be explicitly accepted as also showing compliance with the SMS requirement.
- Many requests to allow use of existing systems in showing compliance (57.1, 58.1, 89.1, 25, 48.1, 68.1, 20, 31.1, 17.1, 35.1, 38.1, 50.1, 10.1, 25.1, 34.1, 24.1, 26.1, 62.1, 72.1, 77, 44.2, 85.1, 70.1, 49.1, 75.1, 24.1). Most commenters who expressed an opinion on the relationship of SMS and QMS proposed that SMS be integrated into existing QMS systems.
- Keeping requirements at a high level/flexible/non-prescriptive (57.1, 89.1, 35.1, 75.1, 50.1, 38.1, 49.1, 50.1, 44.2, 17.1, 30.1, 44.2, 49.1, 58.1)
- Tiered implementation (31.1, 62.1, 72.1, 10.1, 39.1) Some concerns were stated that tiered implementation would not lead to a uniform safety level or would be unfair.
- Limiting the applicability of SMS to some sectors of industry (19.1, 25.1, 50.1, 75.1, 77 etc); there was considerable variation in views on how this should be done. Many small companies said they had not the resources for such a large, complex program (48.1, 80.1, 21, 77, 21.1, 24.1, 26.1, 39.1) and that it would not add value to a simple production process or to a repair station. Equipment suppliers questioned whether their limited scope available for safety improvements justified introduction of SMS. Commenters in the general aviation sector pointed out that their fleets were small and had minimal contribution to system risk. (58.1). Other commenters requested that SMS, if required by regulation, apply to all product and service providers. (57.1, 17.1), or consider immediate application to operators only (16.1,

**APPENDIX B: Summary of Comments to SMS ANPRM**

17.1 , 25.1, 34.1, 50.1, 75.1, 35.1) A cost benefit analysis was requested for each product/service segment.

- Voluntary compliance and guidance, rather than requirements (68.1, 12.1, 87.1, 17.1, 70.1, 33.1, 63.1)
- Accreditation (70.1, 53.1, 49.1, 48.1, 49.1, 38.1 ,16.1)
- Trade group leadership, as opposed to independent efforts (39.1, 16.1)
- Use language of ICAO or of national SMS Standard or of CDO ARC (35.1, 62.1, 38.1, 57.1, 49.1, 19.1, 15.1, 89.1). The AS9100 standard was pointed out as an excellent example to follow. (77, 19.1)
- Use AC39.8 methodology for Safety Risk Assessments (88.1, 62.1 35.1)

**DM6** Many comments from the Design, Manufacturing and Maintenance sectors pointed out that the published material has so far dealt with air carrier operations, that the Design, Manufacturing and Maintenance environment is very different in key respects, and that much additional work would be needed to establish if and how SMS requirements should apply to Design, Manufacturing and Maintenance. (89.1, 57.1, 75.1, 50.1, 10.1, 36.1, 63.1, 38.1, 39.1, 88.1, 77, 19.1, 35.1, 25.1, 62.1). Commenters requested sector-specific, size-specific criteria for findings of compliance for an SMS.

**DM7** There was considerable disagreement on how SMS should apply to suppliers who do not have design ownership. (19.1, 49.1, 38.1, 35.1, 62.1, 88.1, 10.1) Many felt that SMS should only be levied on certificate-holders. Some proposed a flowdown to suppliers by contractual requirement, others foresaw great difficulties in such a system (16.1, 17.1, 34.1, 58.1, 62.1, 35.1, 48.1). Similarly, repair stations were concerned that they would be required to comply with the conflicting SMS implementations of each of their customers. (8.1)

**DM8** There was some confusion over whether SMS should apply to health + safety, or other ancillary disciplines, or only to product safety, clarification was requested (23, 30.1, 75.1, 50.1, 45.1, 19.1, 38.1, 71.1, 72.1, 68.1, 52.1, 26.1, 62.1).

**DM9** Commenters asked that any requirements be objective, clear and consistent, to avoid variation in interpretation. (17.1, 57.1, 89.1, 48.1, 49.1, 88.1, 77, 38.1, 36.1). There have been problems with pilot SMS projects due to shifting interpretation/ expectations on the part of regulatory authorities. (44.2).

**DM10** Many requests were made for the guidance to accommodate various business models and to be scaleable. (10.1, 15.1, 31.1, 35.1, 38.1, 49.1, 57.1, 62.1, 63.1, 72.1, 89.1 )

**DM11** There were many requests for harmonization of the US SMS requirements with those of foreign agencies, and bilateral recognition of SMSs, so that international companies need not comply to multiple different sets of SMS requirements. (17.1, 38.1, 57.1, 89.1, 62.1, 72.1, 30.1, 49.1, 44.2, 50.1). One commenter was concerned over potential disharmony between FAA and other US agency requirements (e.g DoD). (19.1)

**APPENDIX B: Summary of Comments to SMS ANPRM**

**DM12** There were many comments requesting measures to protect safety data/risk assessments from loss of intellectual property rights, from civil and criminal lawsuits, and to promote protection of personnel with SMS duties from criminal proceedings (8.1, 10.1, 17.1, 19.1, 25.1, 35.1, 30.1, 32.1, 33.1, 36.1, 50.1, 57.1, 53.1, 68.1, 75.1, 77, 89.1, 88.1, 62.1, 63.1, 49.1, 58.1, 28.1, 38.1, 16.1, 8.1, 44.2). The downsides of de-identification and the difference in the nature of reporting for an operational vs a design environment were also raised.

**DM13** There is a general desire for concrete metrics and criteria, rather than abstract/academic material (“safety culture” was difficult for many commenters to accept as a requirement basis; commenters from the flight operations area found the “culture” concept more applicable to safety than did those from manufacture and design communities ). (28.1, 49.1, 50.1, 62.1, 77, 88.1, 89.1, 35.1).

There was a lot of concern over how acceptable risk levels should be set; who should do it, should it be driven by risk exposure, what metrics would be appropriate, how metrics could have unintended consequences (distort reporting and behavior). (8.1, 10.1, 16.1, 25.1, 30.1, 38.1, 49.1, 50.1, 57.1, 58.1, 62.1, 63.1, 75.1, 77, 88.1 )

**DM14** There were questions on the requirement for interoperability and how compliance would be shown; the requirement currently appears unbounded. (75.1, 35.1)

**DM15** Some commenters questioned the mandate of the FAA to impose such a broad requirement without a specific safety issue to be addressed. (16.1, 48.1, 68.1, 31.1, 33.1, 64.1). The FAA is currently responsible for the safety of the system (except where delegated); how does the FAA give that responsibility to the product or service provider? This concern was also raised over specific elements of SMS (e.g. is the FAA within their charter to require a company to develop a document management program? 44.2).

**DM16** It was pointed out that since existing SMS programs vary so widely in performance, elements and outcomes, the ANPRM responses on company’s costs benefits and experience will be based on very different understandings of SMS and may not apply to the FAA’s implementation. (64.1).

**DM17** There was concern that businesses retain internal flexibility to select the tools and processes applicable to the circumstances. (58.1, 63.1).

Concern was expressed over timing of implementation and timing of revisions and updates (short cycle times driving confusion and expense).

**DM18** One commenter said the stated requirements went beyond the risk analysis state-of-the-art (quantified risk assessment for operational procedures and substitute risk, 35.1)

**DM19** The FAA was requested to consider how ODA would work with SMS (35.1, 57.1)

**DM20** One commenter advocated the use of an integrated capability maturity model to measure organizational culture. (28.1)

One commenter suggested that integrated capability maturity models likely will incorporate SMS as a metric set, and if so, equitable SMS requirements should be established. (38.1)

**APPENDIX B: Summary of Comments to SMS ANPRM**

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**DM21** Two commenters expressed concern over the safety of helicopter tour passengers. (60, 46) *(Recommend this comment be considered outside ARC scope)*

**DM22** One commenter offered a proposed architecture for data handling. *(Recommend this comment be considered outside ARC scope)*

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## APPENDIX C: Regulatory Gap Analysis – Executive Summary

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### Ground Rules

This analysis addresses regulatory requirements only. Many organizations have process elements in place which they have developed voluntarily or co-operatively with the FAA; such processes are not addressed here.

The analysis was conducted against both the ICAO framework and the Appendix B to Order 8000.367. The current regulatory requirements come much closer to meeting the ICAO framework than they do Appendix B.

The analysis considered the safety of the product separately from the safety of organizational factors.

The referenced appendices show the extent to which existing regulatory requirements mandate process elements of SMS (pink= no requirement in place, yellow= a requirement exists but is not comprehensive; green= the requirement fully addresses the SMS element.)

**Appendix D:** Gap Analysis: Part 21 Design and Order 8000.367 Appendix B Requirements

**Appendix E:** Gap Analysis: Part 21 Manufacturing and ICAO SMS Framework Requirements

**Appendix F:** Gap Analysis: Extent to Which Part 21 D&M Addresses SMS Framework

### Safety Policy

There are no current regulatory requirements for design organization safety policy.

CFR 21 already addresses the appointment of key quality personnel for a production certificate holder (this is functionally “the same as” a requirement to appoint key safety personnel, in a production environment). CFR21 also addresses the definition of accountabilities, and documentation of the QMS and production system. No requirements mandate a management commitment to safety, or coordination of emergency response planning (this last was not considered applicable to the design and production environments).

CFR21 addresses only six of the 37 proposed requirements for Appendix B – safety policy.

### Safety risk management

The current regulatory requirements already control the product safety of new designs; requiring SMS risk management to the design process is considered redundant. Part 21.99 requires type certificate holders to make design changes to address unsafe conditions as determined by FAA. AC 39-8 defines a propulsion system process meeting the intent of safety risk management, and ETOPS fleets have a defined and required process for initial service as well as continuous monitoring.

CFR 21 has recently been revised; the new requirements address many of the risk management and safety assurance processes of ICAO’s SMS framework when applied to a production environment. The notable exception is that CFR21 mandates corrective action by the QMS without a safety risk assessment, so the corrective action might not be prioritized.

Appendix B has 32 requirements under the general subject of safety risk management, ten of which are addressed by current requirements for some products or organization types.

### **Safety Assurance**

CFR 21 already requires QMS performance monitoring and measurement, change management and continuous improvement. This would meet much of the intent of SMS safety assurance, except that monitoring the QMS as a whole might not give a clear metric of SMS performance.

There is no requirement for design organizations in general to perform safety monitoring for new designs or for COS. AC 39-8 defines a propulsion system process meeting the intent of safety monitoring, and so does the ETOPS rule. Only early-ETOPS requires lessons learned from COS to be incorporated into the design process.

Appendix B has 33 requirements under the general subject of safety assurance, a few of which are addressed by current requirements for some products or organization types.

### **Safety Promotion**

There are no current regulatory requirements for safety promotion, either for production or for design organizations.

Appendix B has 14 requirements under the general subject of safety promotion, none of which are addressed by current requirements.



Version: 3/12/2010		Part 21 Design Organization: SMS Requirements Gap Analysis and Exceptions Assessment	
Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE
Preamble	The following requirements are the minimum set of requirements that must be established for constituent product/service provider organizations for which AVS services have oversight responsibility.		
<b>1</b>	<b>Scope and Applicability</b> - to be developed by the AVS service/office.	§21.1 Applicability	(a) This part prescribes— (1) Procedural requirements for the issue of type certificates and changes to those certificates; the issue of production certificates; the issue of airworthiness certificates; and the issue of export airworthiness approvals. (2) Rules governing the holders of any certificate specified in paragraph (a)(1) of this section; and (3) Procedural requirements for the approval of certain materials, parts, processes, and appliances.
			No gap analysis possible since the Order is silent on applicability.
		§25.1 Applicability	(a) This part prescribes airworthiness standards for the issue of type certificates, and changes to those certificates, for transport category airplanes. (b) Each person who applies under Part 21 for such a certificate or change must show compliance with the applicable requirements in this part.
		§33.1 Applicability	(a) This part prescribes airworthiness standards for the issue of type certificates and changes to those certificates, for aircraft engines. (b) Each person who applies under part 21 for such a certificate or change must show compliance with the applicable requirements of part 34 of this chapter.
<b>2</b>	<b>References - to be developed by the AVS service/office</b>		Title 49 USC, 14 CFR, FAA Orders, Advisory Circulars
<b>3</b>	<b>DEFINITIONS (Appendix A)</b> To be developed by the AVS service, but the definitions should be consistent with existing FAA definitions and those in the AVSSMS.  <b>EXCERPTS</b> of key definitions from Appendix A:		

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
	<p><b>Safety Management System (SMS)</b> – The formal, top-down business-like approach to managing <b>safety risk</b>. It includes systematic procedures, practices, and policies for the management of safety (as described in this document it includes Safety Risk Management, safety policy, safety assurance, and safety promotion).</p> <p><b>Safety risk</b> – The composite of predicted severity and likelihood of the potential effect of a <b>hazard</b>.</p> <p><b>Hazard</b> – Any existing or potential condition that can lead to injury, illness or death to people; damage to or loss of a system, equipment, or property; or damage to the environment. A hazard is a condition that is a prerequisite to an <b>accident</b> or <b>incident</b>.</p> <p><b>Accident</b> – An occurrence associated with the operation of an aircraft that takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage.</p> <p><b>Incident</b> – An occurrence other than an accident that affects or could affect the safety of operations.</p>				
<b>4</b>	<b>Policy [Ref Ch 2 of the Order]</b>				
<b>4.a.</b>	<b>General Requirements</b>				
4.a.(1)	Safety Management must be included in life cycle of the organization's outputs	Title 14 Code of Federal Regulations (14CFR)	Every aspect of civil aviation requires that all products, from design & production and throughout operational life (flight & maintenance), be airworthy, including operating the product in accordance with regulatorily defined airworthiness requirements		Actually, there's no requirement for the product to be airworthy before, it's certified. Also, claiming equivalency between airworthiness and safety may get us into difficulties. They are not precisely the same.
4.a.(2)	The organization must promote the growth of a positive safety culture			Propose exception - strike requirement, this will then be consistent with ICAO language	Since no-one knows what a positive safety culture is, or how it can be measured, this requirement should be struck. Need objective requirements.
<b>4.b.</b>	<b>Safety Policy</b>				
4.b.(1)	Top management is responsible for the organization's safety policy and its safety performance				
4.b.(2)	The safety policy must:				Comment: the terms "policy" and "procedure" have different meanings in different organizations, which leads to varying interpretation in this section. To some, "policy" is a general statement of organization intent. To others, it is a very specific binding document constituting the internal rules of the organization. E.g. policy abc says you must not discriminate against another employee on the basis of attributes x,y,z, and if you do you will be subject to disciplinary action up to and including dismissal.....

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
4.b.(2)(a)	include commitment to implement and maintain the SMS				
4.b.(2)(b)	include commitment to continual improvement in the level of safety			Propose exception - strike requirement, this will then be consistent with ICAO language	"Risk management" and "objectives" ((g), below) are in conflict with open ended "continual improvement"
4.b.(2)(c)	include a commitment to management of safety risk, defined as The composite of predicted severity and likelihood of the potential effect of a hazard. (Ref App A)				
4.b.(2)(d)	include commitment to comply with applicable legal, regulatory and statutory requirements			Propose exception - strike requirement, this will then be consistent with ICAO language	Not appropriate content for a Safety policy. The field of "legal regulatory and statutory requirements " is extremely broad, and all companies have existing mechanisms and processes to assure compliance. There is no benefit, and significant drawbacks, to including this as part of SMS. If the FAA wants this, they should identify the legal and statutory requirements and cite them directly, rather than expect each business to do this independently.
4.b.(2)(e)	include an expectation that employees will report safety issues &, where possible, provide proposals for solutions/safety improvements				
4.b.(2)(f)	establish clear standards for acceptable behavior			Propose modification "objective standards for safety-related behavior"	The phrase "acceptable behavior" is so broad that it is impossible for "policy" to establish "clear standards". The work environment inherently has unclear areas - it would be impossible for policy to foresee and rule upon every case in advance. Also, the "behavior" should be bounded to that which could affect safety.
4.b.(2)(g)	provide management guidance for setting safety objectives		Safety objectives are set by regulations, not by "management", in CFR25.1309, CFR25.901c, CFR33.75, AC39-8, etc	Propose modification "or state objectives prescribed by regulatory authorities" Sector -level guidance can then cite 33.75, 25-1309, AC 39.8 etc.	Objectives must be prescribed by FAA regulations and policy, as they currently are for type designs and for propulsion system continued operational safety. It would be very difficult for an organization to set its own safety objectives, from a liability perspective. (and what if the objectives were very low?) There needs to be an external standard set by the authorities, both to provide a common standard of safety, and to limit the exposure of businesses to litigation.

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
		§33.75 Safety analysis	<p>(a) (1) The applicant must analyze the engine, including the control system, to assess the likely consequences of all failures that can reasonably be expected to occur. This analysis will take into account, if applicable: (i) Aircraft-level devices and procedures assumed to be associated with a typical installation. Such assumptions must be stated in the analysis. (ii) Consequential secondary failures and latent failures. (3) The applicant must show that hazardous engine effects are predicted to occur at a rate not in excess of that defined as extremely remote (probability range of 10e(-7) to 10e(-9) [1 per 10,000,000 engine flight hours to 1 per 1,000,000,000 flight hours] ). Since the estimated probability for individual failures may be insufficiently precise to enable the applicant to assess the total rate for hazardous engine effects, compliance may be shown by demonstrating that the probability of a hazardous engine effect arising from an individual failure can be predicted to be not greater than 10e(-8) [1 per 100,000,000] engine flight hours.</p>		
		§25.1309 Equipment, systems, and installations	<p>(a) The equipment, systems, and installations whose functioning is required by this subchapter, must be designed to ensure that they perform their intended functions under any foreseeable operating condition.          (b) The airplane systems and associated components, considered separately and in relation to other systems, must be designed so that—          (1) The occurrence of any failure condition which would prevent the continued safe flight and landing of the airplane is extremely improbable, and          (2) The occurrence of any other failure conditions which would reduce the capability of the airplane or the ability of the crew to cope with adverse operating conditions is improbable.</p>		

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
		AC 25.1309-1A System Design and Analysis	10. Quantitative Assessment B. Quantitative Probability Terms. When using quantitative analyses to help determine compliance with § 25.1309(b), the following descriptions of the probability terms used in this regulation and this AC have become commonly-accepted as aids to engineering judgment. They are usually expressed in terms of acceptable numerical probability ranges for each flight-hour, based on a flight of mean duration for the airplane type. (1) Probable failure conditions are those having a probability greater than on the order of 1 X 10e(-5), [greater than 1 per 100,000 flight-hours]. (2) Improbable failure conditions are those having a probability on the order of 1 X 10e(-5) or less, but greater than on the order of 1 X 10e(-9) [less than 1 per 100,000 flight-hours, but greater than 1 per 1,000,000,000 flight-hours]. (3) Extremely improbable failure conditions are those having a probability on the order of 1 X 10e(-9) or less [less than 1 per 1,000,000,000 flight-hours].		
		AC39-8	This AC also provides CAAM guidance for estimating the risks associated with identified unsafe conditions; defining, prioritizing, and selecting suitable corrective actions for all identified unsafe conditions; and verifying that the corrective actions were effective. This AC is intended to present a tangible means of logically assessing and responding to the safety risks posed by unsafe conditions.		
4.b.(2)(h)	provide management guidance for reviewing safety objectives			Propose modification to reflect ICAO language - strike "and responsible parties"	Company policy might be restricted to employees and not allowed to be distributed externally to "responsible parties". Furthermore, there are employees whose behavior cannot affect product safety; there should be no requirement for them to receive this material.
4.b.(2)(i)	be communicated to all employees & responsible parties				
4.b.(2)(j)	be reviewed periodically to ensure it remains relevant & appropriate to the organization				
4.b.(2)(k)	identify responsibility & accountability of management & employees w/respect to safety performance				
4.c.	<b>Quality policy.</b> Top management must ensure that the organization's quality policy is consistent with the SMS.				
4.d.	<b>Safety Planning.</b> The organization must establish and maintain a safety management plan to meet the safety objectives described in its safety policy.				
4.e.	<b>Organization Structure &amp; Responsibilities</b>				

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
4.e.(1)	Top management must have the ultimate responsibility for the SMS.				
4.e.(2)	Top management must provide resources essential to implement and maintain the SMS				
4.e.(3)	Top management must designate a management official to implement & maintain the SMS				
4.e.(4)	Responsibilities for aviation safety positions, duties and authorizations must be:		<b>NOTE:</b> The term <u>Aviation Safety Position</u> is <b>not defined</b> in Order VS 8000.367, nor in any of the FAA literature. The term is also <b>not defined</b> in the ICAO Safety Management Manual, Doc 9859.		this should not be required to be in a policy. A policy might define functions rather than position guides. The requirement is unwieldy and not necessary to execution of the functions
4.e.(4)(a)	defined				
4.e.(4)(b)	documented; and				
4.e.(4)(c)	communicated throughout the organization				
<b>4.f.</b>	<b>Compliance with Legal &amp; Other Requirements</b>				
4.f.(1)	SMS must include a means of compliance with FAA policy, legal, regulatory & statutory requirements applicable to SMS			Same as 4b2d. Propose exception - strike requirement, this will then be consistent with ICAO language	There are existing means of compliance with legal, regulatory and statutory requirements of many kinds, within each organization. It is not clear why it adds value to uniquely identify those applicable to the SMS and address in safety policy.
4.f.(2)	The organization must establish & maintain a procedure to identify the current FAA policy, legal, regulatory & statutory requirements applicable to SMS			Same as 4b2d. Propose exception - strike requirement, this will then be consistent with ICAO language	There are existing means of compliance with legal, regulatory and statutory requirements of many kinds, within each organization. It is not clear why it adds value to uniquely identify those applicable to the SMS and address in safety policy.
<b>4.g.</b>	<b>Operational Procedures &amp; Controls</b>				
4.g.(1)	The organization must establish procedures with measurable criteria to accomplish its safety policy & objectives as defined by the SMS			Further discussion needed to establish intent of requirement	What is to be measured?
4.g.(2)	The organization must establish & maintain process controls to ensure procedures are followed for operations & activities as defined by the SMS			Further discussion needed to establish intent of requirement.	The intent is unclear. If we publish a policy and require employees to be familiar with it, and have all the systems in place for our SMS, what would be a process control? Not sure how this whole section would apply to design/manufacture.
<b>4.h.</b>	<b>Emergency Preparedness &amp; Response</b>				
4.h.(1)	The organization must establish a plan for response to accidents & serious incidents				
4.h.(2)	effectiveness of the plan must be verified at intervals, either by response to real events or as an exercise				
<b>4.i.</b>	<b>Safety Documentation &amp; Records</b>				
4.i.(1)	The organization must establish and maintain information, in paper or electronic form, to describe:				
4.i.(1)(a)	safety policies				
4.i.(1)(b)	safety objectives				
4.i.(1)(c)	SMS requirements				
4.i.(1)(d)	safety procedures and processes. [Procedure - A specified way to carry out an activity or a process (ref: VS 8000.367 App A Definitions)] [Process - A set of interrelated or interacting activities that transforms inputs into outputs (ref: VS 8000.367 App A Definitions).]				

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
4.1.(1)(e)	responsibilities & authorities for safety procedures & processes				
4.1.(1)(f)	interaction/interfaces between safety procedures & processes			Further discussion needed to establish intent of requirement.	The intent is not clear. What is the distinction between procedures and processes? What constitutes a safety process? Or is this all processes?
4.1.(2)	The organization must document SMS outputs in records.				
4.1.(3)	The organization must maintain docs & records in accordance with document and record management policies specified by the oversight organization.				
5	<b>Safety Risk Management (SRM)</b> SRM - A formal process within the SMS composed of describing the system, identifying the hazards, assessing the risk, analyzing the risk, and controlling the risk. The SRM process is embedded in the processes used to provide the product / service; it is not a separate / distinct process. (ref. Order, App A: Definitions)	§§33.75, 25.571, 25.1309, 25.901c, etc.AC39-8	The regulations cited below define the process, criteria, validation and verification approaches for managing risk for a new type design engine or airplane, and in the case of the propulsion system, the process for managing risk for a product in service.	Design community already complies by requirements in column D, for new design. No further requirement needed for design community - new products	
		§33.75 Safety analysis	(a) (1) The applicant must analyze the engine, including the control system, to assess the likely consequences of all failures that can reasonably be expected to occur. This analysis will take into account, if applicable: (i) Aircraft-level devices and procedures assumed to be associated with a typical installation. Such assumptions must be stated in the analysis. (ii) Consequential secondary failures and latent failures. (3) The applicant must show that hazardous engine effects are predicted to occur at a rate not in excess of that defined as extremely remote (probability range of 10e(-7) to 10e(-9) [1 per 10,000,000 engine flight hours to 1 per 1,000,000,000 flight hours]). Since the estimated probability for individual failures may be insufficiently precise to enable the applicant to assess the total rate for hazardous engine effects, compliance may be shown by demonstrating that the probability of a hazardous engine effect arising from an individual failure can be predicted to be not greater than 10e(-8) [1 per 100,000,000] engine flight hours.	Design community already complies for Propulsion COS, by AC39.8 as implemented.No further requirement needed for Propulsion COS.	

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
		<p>§25.1309 Equipment, systems, and installations</p> <p>(a) The equipment, systems, and installations whose functioning is required by this subchapter, must be designed to ensure that they perform their intended functions under any foreseeable operating condition.</p> <p>(b) The airplane systems and associated components, considered separately and in relation to other systems, must be designed so that—</p> <p>(1) The occurrence of any failure condition which would prevent the continued safe flight and landing of the airplane is extremely improbable, and</p> <p>(2) The occurrence of any other failure conditions which would reduce the capability of the airplane or the ability of the crew to cope with adverse operating conditions is improbable.</p>	<p>AC 25.1309-1A System Design and Analysis</p> <p>10. Quantitative Assessment. B. Quantitative Probability Terms. When using quantitative analyses to help determine compliance with § 25.1309(b), the following descriptions of the probability terms used in this regulation and this AC have become commonly-accepted as aids to engineering judgment. They are usually expressed in terms of acceptable numerical probability ranges for each flight-hour, based on a flight of mean duration for the airplane type. (1) Probable failure conditions are those having a probability greater than on the order of <math>1 \times 10e(-5)</math>, [greater than 1 per 100,000 flight-hours]. (2) Improbable failure conditions are those having a probability on the order of <math>1 \times 10e(-5)</math> or less, but greater than on the order of <math>1 \times 10e(-9)</math> [less than 1 per 100,000 flight-hours, but greater than 1 per 1,000,000,000 flight-hours]. (3) Extremely improbable failure conditions are those having a probability on the order of <math>1 \times 10e(-9)</math> or less [less than 1 per 1,000,000,000 flight-hours].</p>		
5.a.	SRM must, at a minimum, include the following processes:	AC39-8	<p>This AC also provides CAAM guidance for estimating the risks associated with identified unsafe conditions; defining, prioritizing, and selecting suitable corrective actions for all identified unsafe conditions; and verifying that the corrective actions were effective. This AC is intended to present a tangible means of logically assessing and responding to the safety risks posed by unsafe conditions.</p>		



Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
5.a.(1)	describe system; [SYSTEM - An integrated set of constituent elements that are combined in an operational or support environment to accomplish a defined objective. These elements include people, hardware, software, firmware, information, procedures, facilities, services and other support facets. (ref. Order, App. A: Definitions)]		AC33.75 System refers to a combination of inter-related items arranged to perform a specific function(s).	Propose definition be revised to be more closely bounded.	The definition of 33.75 is far more applicable. The definition from the order is so broad, the task is unbounded and beyond today's analytical capabilities.
5.a.(2)	identify hazards; [Hazard - Any existing or potential condition that can lead to injury, illness or death to people; damage to or loss of a system, equipment, or property; or damage to the environment. A hazard is a condition that is a prerequisite to an accident or incident. (ref. Order, App. A: Definitions)]	§§33.75, 25.571, 25.1309, etc.AC39-8		Design community already complies by requirements in column D, for new design. No further requirement needed for design community - new products	
5.a.(3)	analyze safety risk; [Safety risk - The composite of predicted severity and likelihood of the potential effect of a hazard. (ref. Order, App. A: Definitions)]	§§33.75, 25.571, 25.1309, etc. AC39-8		Design community already complies by requirements in column D, for new design. No further requirement needed for design community - new products	
5.a.(4)	assess safety risk; and	§§33.75, 25.571, 25.1309, etc.AC39-8		Design community already complies by requirements in column D, for new design. No further requirement needed for design community - new products	
5.a.(5)	control/mitigate safety risk	§21.50 Instructions for continued airworthiness	ICA includes Airworthiness Limitations section, an element of the type design per §21.31(c), and servicing information, scheduling information which provides recommended periods for cleaning, inspecting, adjusting, testing, lubricating, wear tolerances, troubleshooting, and list of tools and equipment.	Design community already complies by requirements in column D, for new design. No further requirement needed for design community - new products	
		AC39-8	Contains criteria for determining, for the propulsion system, whether an unsafe condition exists; acceptable probability/severity criteria, time limits for mitigation of the condition, guidance on validation of any statistical model of the risk condition, and verification of the effectiveness of the mitigating action. AC39-8 completely meets the intent of the safety risk management and safety assurance aspects of SMS, once the propulsion system has entered service.	Design community already complies for Propulsion COS, by AC39.8 as implemented. No further requirement needed for Propulsion COS.	

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
5.b.	The elements of the SRM process must be applied, either qualitatively, or quantitatively, to:				
5.b.(1)	initial designs of systems, organizations & products; [System - An integrated set of constituent elements that are combined in an operational or support environment to accomplish a defined objective. These elements include people, hardware, software, firmware, information, procedures, facilities, services and other support facets) *.		<p><b>SYSTEMS:</b> The foundation of civil aviation in the U.S. is <b>airworthiness</b>; conformance to type certificate for products and conformance to type design for component parts of products, and in condition for safe operation. Products (type certificated aircraft, aircraft engines, and propellers and all parts comprising those products) are designed according to the appropriate <b>Airworthiness Standards</b>; 14CFR Part 23 for Normal, Utility, Acrobatic, and Commuter Category Airplanes; Part 25 for Transport Category Airplanes; Part 27 for Normal Category Rotorcraft, Part 29 for Transport Category Rotorcraft; and, Part 33 for Aircraft Engines. The products are type certificated according to the stringent requirements contained in 14CFR Part 21 - Certification Procedures for Products and Parts.</p>	Design community already complies by requirements in column D, for new design. No further requirement needed for design community - new products	
			Specifically, safety analyses are conducted on engines (33.75), propulsion systems (25.901c), and all airplane systems (25.1309) to ensure that they meet acceptable hazard probability/severity criteria before the product can be certified.		
			AC33.75 System refers to a combination of inter-related items arranged to perform a specific function(s).		The definition of 33.75 is far more applicable. The definition from the order is so broad, the task is unbounded and beyond today's analytical capabilities.
			<b>ORGANIZATIONS:</b>		There is no mandate for the FAA to approve the "design of organizations"

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
			<p><b>PRODUCTS:</b> A newly manufactured aircraft is issued its original <b>airworthiness</b> certificate when it is found to conform to its type design and to be in condition for safe operation. At that time, it meets the safety criteria defined in the regulations. (ref. §21.183(a) &amp; (b)) When it enters service, maintaining its <b>airworthiness</b>, i.e. maintaining conformance to its type certificate (and for all installed component parts, maintaining their conformance to their respective type designs), and its condition for safe operation, lies in the realm of the maintenance provider. The primary means of continuing the <b>airworthiness</b> of in-service aircraft is by using "the methods, techniques, and practices prescribed in the current manufacturer's maintenance manual or <b>Instructions for Continued Airworthiness</b> (required by §21.50) prepared by its manufacturer." (ref. §43.13(a))</p>		
5.b.(2)	the development of safety operational procedures;		Type certificate holders may have Continued Operational Safety Processes agreed with the FAA, such as those defined in AC39-8.	Propose requirement be struck, for Design and manufacturing sectors	: it is not possible to apply the full SRM process to development of operational procedures. If "operational procedures" means the customer's use of the product, the data to quantify risk does not exist; instead operational procedures are developed using precedent, pilot's experienced judgment and knowledge of past Lessons Learned. If "operational procedures" means design company internal processes, it is truly impossible to quantify risk associated with a change. (e.g what is the change in risk by having a design review conducted by phone/Webex, rather than with physical presence?) Similarly, what is the risk in manufacturing of using grinding machine A vs B?
5.b.(3)	hazards [Hazard – Any existing or potential condition that can lead to injury, illness or death to people; damage to or loss of a system, equipment, or property; or damage to the environment. A hazard is a condition that is a prerequisite to an accident or incident.(ref App A Definitions, Order VS 8000.367)] that are identified in the safety assurance functions -- described in Chapter 6.	§21.3 Reporting of failures, malfunctions, and defects	(a) Except as provided in paragraph (d) of this section, the holder of a Type Certificate (including a Supplemental Type Certificate), a Parts Manufacturer Approval (PMA), or a TSO authorization, or the licensee of a Type Certificate shall report any failure, malfunction, or defect in any product, part, process, or article manufactured by it that it determines has resulted in any of the occurrences listed in paragraph (c) of this section.	Already complies for the design sector by the type certification safety analysis. Already complies for the manufacturing sector via the QMS processes in place (corrective action taken for non-conformances)	
		§145.221 Service difficulty reports			

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
5.b.(4)	planned changes to the production/operational system, including introduction of new products & procedures, to identify hazards associated with those changes		Introduction of new products is controlled by type certification or by the design change system. 78110 form?	Already complies for the manufacturing sector, via part 21 QMS requirements. Already complies for the design sector, via type certification and by design change system.	Changes to the production system are already addressed by the quality system. Design changes are validated and certified by CCM. These processes provide assurance that unintended effects will not result. Addition of a SRM element would not be practicable (the data do not exist to support analyses) or added value.
5.c.	The organization must establish feedback loops between assurance functions (described in Ch 6) to evaluate the effectiveness of safety risk controls [ref Fig B-1]				
5.d.	<b>The organization must define a process for risk acceptance</b>				
5.d.(1)	The organization must define acceptable and unacceptable levels of safety risk		The only risk acceptance in all of 14CFR is related to certain flight test certification items, and when issuing a Special Flight Permit (§21.197), or special flight authorization i/law §91.715. At all other times, all civil aircraft must be airworthy (conform to type certificate/type design and be in condition for safe operation (ref. §91.7). That is to say, there is no decision to accept or reject a risk or hazard; type certificated products, and all components, appliances and parts installed thereon MUST be airworthy.	Propose modification - "...acceptable levels of safety risk (may be set by regulation)" Already complies for Design, via type design safety analysis. Already complies for manufacturing, via QMS process	Acceptable levels of risk must be provided by the oversight organization, to ensure a consistent level of safety throughout the system and to provide legal protection to the organization.
5.d.(2)	The organization must define levels of management able to make safety risk acceptance decisions		Acceptable risk levels for product certification are defined in CFR33.75, 25.1309; acceptable risk levels for continued airworthiness are defined in AC39-8.	Propose modification "able to review safety risk against defined acceptable levels"	Internal policy defines levels of management to review risk, but the FAA has final authority on whether risk level is acceptable. For instance, the FAA has not given manufacturers the authority to decide whether or not Airworthiness Directives should be written.

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
5.d.(3)	The organization must define level of safety risk that is acceptable in the short-term, while long-term safety risk control/mitigation plans are developed and implemented.		Safety risk (The composite of predicted severity and likelihood of the potential effect of a hazard. (ref. Order VS 8000.367, App. A: Definitions)) is NOT an element of continuing airworthiness / maintenance. <b>Airworthiness</b> Standards, including Parts 23, 25, and 33, contain quantitative design requirements to ensure safe flight and landing in the event that any failure condition occurs. Those requirements are contained in a product's type certificate, an element of airworthiness. The <b>Instructions for Continued Airworthiness</b> (also part of the type certificate, and required by §21.50(b)), through the exhaustive Maintenance Review Board process (for transport category aircraft) are developed to ensure realization of the inherent safety and reliability levels of the equipment (as designed, certificated, and manufactured); and to restore safety and reliability to their inherent levels when deterioration has occurred.	Propose modification - "...(acceptable levels may be set by regulation)"	
5.e.			Acceptable short-term risk levels for continued airworthiness are defined in AC39-8, as are parameters for the introduction /implementation of mitigation plans.	Already complies for propulsion, via AC39.8 as implemented.	
5.e.	If applicable, the organization must establish procedures to obtain oversight organization approval for those planned changes that require oversight approval prior to implementation (in accordance with Chapter 4, Section f).		Procedures already exist for obtaining oversight approval to design changes (8110).	Already complies for manufacturing via QMS process. Already complies for design, via design change process.	
5.f.					
5.f.	The safety risk of identified hazards must be deemed acceptable prior to implementation of the following items in the production/operational system: [SYSTEM - An integrated set of constituent elements that are combined in an operational or support environment to accomplish a defined objective. These elements include people, hardware, software, firmware, information, procedures, facilities, services and other support facets. (ref. Order, App. A: Definitions)]				
5.f.(1)	new system designs;		Compliance with the risk levels defined in 25.1309, 25.901c and 33.75, as applicable, is already a certification requirement.	Already complies for design via the type certification process	already addressed for design organizations by the certification process
5.f.(2)	changes to existing system designs;		the 8110 process already ensures that changes to existing designs do not increase the level of risk beyond that required for initial certification.	Already complies for design, via the design change process.	

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
5.f.(3)	new operations/procedures; and			The concept of operations/procedures is not clear in the context of a design organization's SMS. Provided that the design is safe, the organizations procedures do not involve risk. The term "operations" is not understood in this context. Manufacturing already complies via the QMS process	
5.f.(4)	modified operations/procedures			The concept of operations/procedures is not clear in the context of a design organization's SMS. Provided that the design is safe, the organizations procedures do not involve risk. The term "operations" is not understood in this context. Manufacturing already complies via the QMS process	the intent is unclear. Risk assessment is not practicable for operations/procedures, as discussed above.
5.g.	The SRM process may allow AVS or AVS services/offices to take interim immediate action to mitigate existing safety risk.	§39.5 When does FAA issue airworthiness directives?	FAA issues an airworthiness directive addressing a product when we (FAA) find that: (a) An unsafe condition exists in the product; and (b) The condition is likely to exist or develop in other products of the same type design.	This provision allows action by the FAA, it is not a requirement placed upon the design organization. It should not appear in this document.	
5.h.		§21.99 Required design changes	(a) When an Airworthiness Directive is issued under Part 39 the holder of the type certificate for the product concerned must— (1) If the Administrator finds that design changes are necessary to correct the unsafe condition of the product, and upon his request, submit appropriate design changes for approval; and (2) Upon approval of the design changes, make available the descriptive data covering the changes to all operators of products previously certificated under the type certificate. (b) In a case where there are no current unsafe conditions, but the Administrator or the holder of the type certificate finds through service experience that changes in type design will contribute to the safety of the product, the holder of the type certificate may submit appropriate design changes for approval. Upon approval of the changes, the manufacturer shall make information on the design changes available to all operators of the same type of product.	§21.99 already empowers the FAA to do this.	
5.h.					

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
5.h.	Describe System. The system description must be completed to the level necessary to identify hazards. [Hazard – Any existing or potential condition that can lead to injury, illness or death to people; damage to or loss of a system, equipment, or property; or damage to the environment. A hazard is a condition that is a prerequisite to an accident or incident. (ref. Order, App. A; Definitions)]		5h.i, j, k. only repeat the provisions of 5a. The responses and existing regulations for 5a apply.		
5.i.	Identify Hazards. Hazards must be identified within the system as described in Section h (above).		As indicated immediately above, hazards are identified and analyzed, and their effects are considered in the design and certification of engines. When risks exceed the acceptable levels defined in part 33 and 25 regulations, their effects are mitigated , as required for product certification.		
5.j.	Analyze Safety Risk. The process must include analyses of:		As indicated immediately above, hazards are identified and analyzed, and their effects are considered in the design and certification of engines. When risks exceed the acceptable levels defined in part 33 and 25 regulations, their effects are mitigated , as required for product certification.		
5.j.(1)	existing safety risk controls [Safety risk control – A characteristic of a system that reduces safety risk. Controls may include process design, equipment modification, work procedures, training or protective device. (ref. App A Definitions, Order VS 800.367);				
5.j.(2)	contributing factors; and				
5.j.(3)	the safety risk of reasonably likely outcomes from the existence of a hazard, to include estimation of the:				
5.j.(3)(a)	likelihood and				
5.j.(3)(b)	severity				
5.k	Assess Safety Risk. [Safety risk – The composite of predicted severity and likelihood of the potential effect of a hazard. (ref. App A Definitions, Order VS 8000.367)]		As indicated immediately above, hazards are identified and analyzed, and their effects are considered in the design and certification of engines. When risks exceed the acceptable levels defined in part 33 and 25 regulations, their effects are mitigated , as required for product certification.		
5.l.	Control/Mitigate Safety Risk.		As indicated immediately above, hazards are identified and analyzed, and their effects are considered in the design and certification of engines. When risks exceed the acceptable levels defined in part 33 and 25 regulations, their effects are mitigated , as required for product certification.		
5.l.(1)	Safety risk control/mitigation plans must be defined for hazards identified with unacceptable risk.				

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
5.1.(2)	Substitute risk [Substitute risk – Risk unintentionally created as a consequence of safety risk control(s)] [Safety risk control – A characteristic of a system that reduces safety risk. Controls may include process design, equipment modification, work procedures, training or protective device.](ref App A Definitions, Order VS 8000.367) must be evaluated in the creation of safety risk controls/mitigations			Propose requirement be struck.	The evaluation of substitute risk is beyond the state of the art. There is no means to fully comply with this requirement
5.1.(3)	Safety risk control/mitigation must be evaluated to ensure that safety reqmts have been met				
5.1.(4)	when safety risk control/mitigation plans are implemented, they must be monitored to ensure that safety risk controls have the desired effect.				
6.00	<b>Safety Assurance [Ref Ch 4 of the Order]</b>				
6.a.	<b>General Requirements. The organization must monitor its systems, operations and products/services to:</b>				
6.a.(1)	Identify new hazards;	\$21.3 Reporting of failures, malfunctions, and defects	(a) Except as provided in paragraph (d) of this section, the holder of a Type Certificate (including a Supplemental Type Certificate), a Parts Manufacturer Approval (PMA), or a TSO authorization, or the licensee of a Type Certificate shall report any failure, malfunction, or defect in any product, part, process, or article manufactured by it that it determines has resulted in any of the occurrences listed in paragraph (c) of this section.	Already addressed by 21.3 for Design and manufacturing sectors.	There is no requirement for organizations to be aware of product failures in service. In many cases, there is no mechanism for them to become informed of such events. Operators are not required to report to the manufacturer or design organization
		\$21.99 Required design changes	(a) When an Airworthiness Directive is issued under Part 39 the holder of the type certificate for the product concerned must— (1) If the Administrator finds that design changes are necessary to correct the unsafe condition of the product, and upon his request, submit appropriate design changes for approval; and (2) Upon approval of the design changes, make available the descriptive data covering the changes to all operators of products previously certificated under the type certificate		
6.a.(2)	Measure the effectiveness of safety risk controls [Safety risk control – A characteristic of a system that reduces safety risk. Controls may include process design, equipment modification, work procedures, training or protective device. (ref. App A Definitions, Order VS 8000.367);		The process defined in AC39-8 includes verification that safety risk controls are effective in mitigating the risk being addressed.	Already addressed for Propulsion by AC 39.8 as implemented.	
6.a.(3)	Assess compliance with legal, regulatory & statutory requirements applicable to the SMS; and			See 4b2d. Propose exception - strike requirement, this will then be consistent with ICAO language	



Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
6.a.(4)	Assess conformity with organizational safety policies & procedures				
6.b.	<b>Information Acquisition</b> The organization must collect data/information necessary to demonstrate the effectiveness of the SMS			This is a new requirement and potentially very burdensome, especially to the sectors of general aviation and business/air-taxi.	
6.b.(2)	The organization must monitor operational data/information.				
6.b.(3)	The organization must monitor products & services received from contractors			Already required for manufacturing by QMS requirements. Already required for Design by type certification safety analysis.	
6.c.	<b>Employee Reporting System</b> The organization must establish & maintain an employee reporting system in which employees can report hazards, issues, concerns, occurrences, occurrences, incidents, etc., as well as propose solutions/safety improvements				
6.c.(2)	Employees must be encouraged to use the employee reporting system without reprisal (footnote 6: This does not restrict management from taking action in cases of gross negligence or willful operation outside the organization's safety requirements)				
6.d.	<b>Investigation</b> The organization must establish criteria for which accidents & incidents will be investigated.				
6.d.(1)			In both federal law and in Order VS 8000.367, accidents and incidents pertain to aircraft flight operation only, not to maintenance, or administrative, operations. See 4.h.(1), above.		
6.d.(2)	The organization must establish procedures to:				
6.d.(2)(a)	investigate accidents				
6.d.(2)(b)	investigate incidents, and				
6.d.(2)(c)	investigate instances of suspected non-compliance with safety regulations.			Propose exception; this is not appropriate to Design and Manufacturing environment.	This requirement is directed at carrier operations and is not appropriate for design/manufacture/repair. Strong corrective processes already exist for production and repair services. For design and continued airworthiness, the FAA makes a compliance finding, not the manufacturer.
6.e.	<b>Auditing of the Production/Operational System</b>				

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
6.e.(1)	<p>The organization must ensure that regular audits of production/operational system's safety functions are conducted with priority on the areas of highest safety risk. This obligation must extend to any contractors the organization may use to accomplish those functions. (Footnote 8: The organization can choose to conduct audits of its contractors or require that contractors conduct their own audits and provide the resultant data/information to the organization.)</p>		<p>Safety risk (The composite of predicted severity and likelihood of the potential effect of a hazard; (ref. Order VS 8000.367, App. A- Definitions)). <b>NOT</b> an element of continuing airworthiness. Maintenance, Airworthiness Standards including Parts 23, 25, and 33, contain quantitative design requirements to ensure safe flight and landing in the event that any failure condition occurs. These requirements are contained in a product's type certificate, an element of airworthiness. The <b>Instructions for Continued Airworthiness</b> (also part of the type certificate, and required by §21.50(b)), through the elaborate Maintenance Review Board process for transport category aircraft) are developed to ensure realization of the inherent safety and reliability levels of the equipment (as designed, certificated, and manufactured); and to restore safety and reliability to their inherent levels when deterioration has occurred.</p>	<p>Need discussion in order to understand intent of requirement</p>	
6.e.(2)	<p>The organization must ensure regular audits are conducted to:</p>				<p>the term "audit" may not be appropriate. It is not clear what is meant by "safety function". Organizational branches tagged as "safety"? They do not introduce safety risk, their job is to reduce risk, so why audit them? Or organizations whose activities result in a safe product? That would be almost the entire business...</p> <p>The intent of the phrase "safety function" is not clear with respect to a design organization. The design organization produces safe products by ensuring that the products work, meet the design intent, and are certified. In that sense, every engineer performs a "safety function". The safety organization typically performs oversight. It does not introduce "safety risk". Auditing the safety organization does not appear to directly support the overall intent of designing safe products.</p> <p>Comment: The extent of applicability of an SMS is not clear, but any organization with an SMS should be "audited" by itself or by the FAA. TC holders should not be tasked with policing the internal processes of other companies, nor is it practicable to require this – subcontractors would then be audited multiple times by different customers, to subtly different requirements.</p>

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
6.e.(2)(a)	determine conformity with safety risk controls; and (Safety risk control – A characteristic of a system that reduces safety risk. Controls may include process design, equipment modification, work procedures, training or protective device. (ref App A Definitions, Order VS8000.367))		Safety risk (The composite of predicted severity and likelihood of the potential effect of a hazard. (ref. Order VS 8000.367, App. A: Definitions)) is NOT an element of continuing airworthiness / maintenance. Airworthiness Standards, including Parts 23, 25, and 33, contain quantitative design requirements to ensure safe flight and landing in the event that any failure condition occurs. Those requirements are contained in a product's type certificate, an element of airworthiness. The Instructions for Continued Airworthiness (also part of the type certificate, and required by §21.50(b)), through the elaborate Maintenance Review Board process (for transport category aircraft) are developed to ensure realization of the inherent safety and reliability levels of the equipment (as designed, certificated, and manufactured); and to restore safety and reliability to their inherent levels when deterioration has occurred.	Need discussion in order to understand intent of requirement	
					The requirement could not be interpreted in the context of a design organization.
				The intent of the phrase "safety risk control" is not clear with respect to a design organization. The design organization produces safe products by ensuring that the products work, meet the design intent, and are certified. Provided this is done, there is no need for "safety risk controls", they are frozen into the design.	
			For continued operational safety - if an unsafe condition is identified in the design - AC39-8 clearly defines the process for introducing mitigating action and ensuring that it is effective.		
6.e.(2)(b)	assess performance of safety risk controls		For continued operational safety - if an unsafe condition is identified in the design - AC39-8 clearly defines the process for introducing mitigating action and ensuring that it is effective.	Propulsion already complies by AC 39.8 as implemented.	
6.e.(3)	Auditing may be done at planned intervals or as a continuing process				
6.f.	Evaluation of the SMS ((SMS) – The formal, top-down business-like approach to managing safety risk. It includes systematic procedures, practices, and policies for the management of safety (as described in this document it includes Safety Risk Management, safety policy, safety assurance, and safety promotion). (ref App A Definitions, Order VS8000.367))				

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
6.f.(1)	The organization must conduct evaluations of the SMS to determine if the SMS conforms to requirements.				
6.f.(2)	Evaluations may be done at planned intervals or as a continuing process.				if the SMS meets requirements during an initial evaluation, why are further evaluations required? What would have changed?
6.g.	Audits by Oversight Organization. If applicable, the organization must include the results of oversight organization audits in the data/information analyses conducted as described in Section h.				
6.h.	Analysis of Data/Information The organization must analyze the data/information described in Section b.			Analysis of Propulsion operational data is already required in AC39.8 as implemented	some of this data may require analysis, but not necessarily all of it.
6.i.	<b>System Assessment</b>				
6.i.(1)	The organization must assess the performance of:			Compliance not possible until SMS is in place	
6.i.(1)(a)	the production/operational system's safety functions against its safety requirement(s) as defined by the SMS and			Compliance not possible until SMS is in place	
6.i.(1)(b)	the SMS against its requirements			Compliance not possible until SMS is in place	
6.i.(2)	System assessments must result in the documentation of:				
6.i.(2)(a)	conformity with existing safety risk control(s)/SMS requirement(s) (including legal, regulatory, & statutory requirements applicable to the SMS);				
6.i.(2)(b)	nonconformity with existing safety risk control(s)/SMS requirement(s) (including legal, regulatory & statutory requirements applicable to the SMS);				
6.i.(2)(c)	potential ineffective control(s); and				
6.i.(2)(d)	potential hazard(s) found.				
6.i.(3)	The SRM process must be utilized if the assessment identifies:				
6.i.(3)(a)	potential hazards or				
6.i.(3)(b)	the need for production/operational system changes				
6.j.	Corrective Action. When nonconformities are identified, the organization must prioritize and implement corrective actions			Manufacturing already complies via QMS requirements. Design already complies via disclosure on non-compliance process.	
6.k.	<b>Management Reviews</b>				
6.k.(1)	Top management must conduct regular reviews of SMS effectiveness			Compliance not possible until SMS is in place	
6.k.(2)	Management reviews must assess the need for changes to the SMS			Compliance not possible until SMS is in place	
7	<b>Safety Promotion [Ref Ch 6 of the Order]</b>				

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
7.a.	<b>Safety Culture.</b> Safety Culture. Top management must promote the growth of a positive safety culture demonstrated by, but not limited to:				
7.a.(1)	publication to all employees of sr. mgt's stated commitment to safety;				
7.a.(2)	communication of safety responsibilities with the organization's personnel to make each employee part of the safety process;				
7.a.(3)	Clear & regular communications of safety policy, goals, objectives, standards & performance to all employees of the organization;			Propose discussion of how this is effective and appropriate in design and manufacturing communities, before levying a requirement.	before setting requirements for safety promotion, it should be clear how the requirement will support the objective. It is not clear how this requirement will change employee behavior in the design/manufacture/repair sector. Manufacturing employees know, and take very seriously, the requirement to produce parts to print. Communicating safety policy, goals and objectives will not affect this in any way.
7.a.(4)	an effective employee reporting system that provides confidentiality and de-identification as appropriate (as described in Chapter 6, Section c);				
7.a.(5)	use of safety information system that provides accessible, efficient means to retrieve information; and				
7.a.(6)	allocation of resources to implement & maintain the SMS				
7.b.	<b>Communication and Awareness</b>				

Order 8000.367 Appendix B	SUBJECT - TITLE	FAR Part 21 & as indicated	SUBJECT - TITLE	Exceptions Assessment (i.e. limits of applicability)	Comments/Notes
7.b.(1)	The organization must communicate SMS outputs to employees as appropriate [SMS Output - The result or product of an SMS process. In this context, the result of a process, which is intended to meet a requirement described in this Standard (e.g., results of safety risk analyses, safety audits, and safety investigations) Order VS 8000.367, Appendix A: Definitions]			Compliance not possible until SMS is in place	
7.b.(2)	If applicable, the organization must provide access to the SMS outputs to its oversight organization, in accordance with established agreements & disclosure programs			Compliance not possible until SMS is in place	
7.b.(3)	The organization must ensure that affected employees & external stakeholders (including its oversight organization, if applicable) are aware of the short-term safety risk of hazards that may exist in the production/operational system while safety risk control/mitigation plans are developed & implemented (as described in Chapter 5, Section d3)		The only possible meaning of hazard is with respect to any existing or potential condition that could lead to injury, illness or death to people during the operation of a civil aircraft. The damage to or loss of a system, equipment, or property likewise is with respect to the operation of civil aircraft. Flying on civil aircraft is not part of the normal duties of a design engineer, employees of design organizations are no more exposed to short term safety risks while hazards are being mitigated than is the general public. It is not clear whether this requirement directs that short-term safety risks be communicated to the general public, nor what means would be used to do so.	Interpretation required.	
7.c.	<b>Personnel Competency</b>				
7.c.(1)	The organization must document competency requirements for those positions identified in (App B) CH 4, Sect. e4. [Aviation Safety Positions]		<b>NOTE:</b> The term <b>Aviation Safety Position</b> is not defined in Order VS 8000.367, nor in any of the FAA literature. The term is also not defined in the ICAO Safety Management Manual, Doc 9859. It is assumed that it refers to those whose primary duties are focused specifically on aviation safety, rather than normal design.		It is not clear that documenting competency requirements is an appropriate approach. It is not clear who, in the organization, is able to assess competency in the specialized area of safety engineering, and how their competency to do so is to be assessed. The phrase "key competencies" might be more applicable than competency requirements.
7.c.(2)	The organization must ensure that individuals in the positions identified in (App B) Ch 4, Sect. e4 meet the documented competency requirements.				
7.d.	<b>Safety Knowledge Management.</b>				
7.d.	Safety Knowledge Management. The SMS must include a process to capture knowledge of safety and incorporate it into future products, services and practices as appropriate.				
8	<b>Interoperability</b>				
8	Interoperability [Ref Ch 7 of the Order] The organization's SMS must be able to interoperate with other organizations' SMSs to manage cooperatively issues of mutual concern.			Interpretation required.	It is not clear how compliance to this requirement can be shown by any one organization, since it depends on the interaction of multiple organizations.

organization: (ICAO) SMS Requirements Gap Analysis and Exceptions Assessment  
2009

ICAO Requirements	Regulatory References	Text	Comments/Notes
<b>1.1 Management commitment and responsibility</b>	21.135	<p>Each applicant for or holder of a production certificate must provide the FAA with a document describing how its organization will ensure compliance with the provisions of this subpart. At a minimum, the document must describe assigned responsibilities and delegated authority, and the <u>functional relationship of those responsible for quality to management and other organizational components</u></p>	<p>The ICAO checklist for this element suggests a number of other items that could be addressed, but that are not addressed by US regulations, such as (1) A clear statement about the provision of the necessary resources for the implementation of the safety policy, (2) Safety reporting procedures, (3) Signature of the Accountable Executive, (4) Communication throughout the entire Organization, (5) Periodic review to ensure the policy remains relevant and appropriate, (6) A formal process for developing a coherent set of safety objectives, (7) A link between the safety objectives and the safety performance indicators, safety performance targets and action plans</p>
<b>1.2 Safety accountabilities</b>	21.135	<p>Each applicant for or holder of a production certificate must provide the FAA with a document describing how its organization will ensure compliance with the provisions of this subpart. At a minimum, the document must <u>describe assigned responsibilities and delegated authority, and the functional relationship of those responsible for quality to management and other organizational components</u>.</p>	<p>Although there is a requirement to specify in writing the assigned responsibilities, there is no requirement to specify an accountable executive; however it does appear that there is a requirement to document safety responsibilities, accountabilities and authorities</p>
<b>1.3 Appointment of key safety personnel</b>	21.135	<p>Each applicant for or holder of a production certificate must provide the FAA with a document describing how its organization will ensure compliance with the provisions of this subpart. At a minimum, the document must <u>describe assigned responsibilities and delegated authority, and the functional relationship of those responsible for quality to management and other organizational components</u>.</p>	
<b>1.4 Coordination of emergency response planning</b>	21.137(h)(1)	<p>Each applicant for or holder of a production certificate must establish and describe in writing a quality system that ensures that each product and article conforms to its approved design and is in a condition for safe operation. This quality system must include: (h)(1) Procedures to ensure that only products or articles that conform to their approved design are installed on a type-certificated product. These procedures must provide for the identification, documentation, evaluation, segregation, and disposition of nonconforming products and articles. Only authorized individuals may make disposition determinations.</p>	<p>ICAO describes this as a requirement that the safety authorities, responsibilities and accountabilities of personnel at all levels of the organization be defined and documented</p>
		<p>THERE IS NO PART 21 REQUIREMENT FOR EMERGENCY RESPONSE PLANNING BY A PRODUCTION APPROVAL HOLDER</p>	<p>ICAO describes this as a requirement for an emergency response contingency plan</p>

ICAO Requirements	Regulatory References	Text	Comments/Notes
1.5 SMS documentation	21.135  21.137	<p>Each applicant for or holder of a production certificate must provide the FAA with a document describing how its organization will ensure compliance with the provisions of this subpart. At a minimum, the document must describe assigned responsibilities and delegated authority, and the functional relationship of those responsible for quality to management and other organizational components.</p> <p>Each applicant for or holder of a production certificate must establish and describe in writing a quality system that ensures that each product and article conforms to its approved design and is in a condition for safe operation. This quality system must include: ETC.</p>	<p>The existing regulations do not require the specific SMS elements, like risk analysis, to be described in the context of their SMS identifiers, but the elements of SMS exist in the written production system.</p>
2.1 Hazard identification	21.137(n)  21.137(g)  21.137(m)	<p>Each applicant for or holder of a production certificate must establish and describe in writing a quality system that ensures that each product and article conforms to its approved design and is in a condition for safe operation. This quality system must include: (n) Quality escapes. Procedures for identifying, analyzing, and initiating appropriate corrective action for products or articles that have been released from the quality system and that do not conform to the applicable design data or quality system requirements.</p> <p>Each applicant for or holder of a production certificate must establish and describe in writing a quality system that ensures that each product and article conforms to its approved design and is in a condition for safe operation. This quality system must include: (g) <i>Inspection and test status</i>. Procedures for documenting the inspection and test status of products and articles supplied or manufactured to the approved design.</p> <p>Each applicant for or holder of a production certificate must establish and describe in writing a quality system that ensures that each product and article conforms to its approved design and is in a condition for safe operation. This quality system must include: (m) <i>In-service feedback</i>. Procedures for receiving and processing feedback on in-service failures, malfunctions, and defects. These procedures must include a process for assisting the design approval holder to— (1) Address any in-service problem involving design changes; and (2) Determine if any changes to the Instructions for Continued Airworthiness are necessary.</p>	<p>ICAO anticipates that companies will have a formal safety data collection and processing system for actively seeking and effectively collecting information about hazards. 21.137(g) provides the foundation for collecting internal data that would support hazard identification, but there is no affirmative obligation to engage in hazard identification. 21.137(n) is reactive to quality escapes. 21.137(m) responds to data from in-service operations, but it could be accused of being inadequately proactive.</p>



ICAO Requirements	Regulatory References	Text	Comments/Notes
2.2 Safety risk assessment and mitigation	21.3(f)	(f) If an accident investigation or service difficulty report shows that a product or article manufactured under this part is unsafe because of a manufacturing or design data defect, the holder of the production approval for that product or article must, upon request of the FAA, report to the FAA the results of its investigation and any action taken or proposed by the holder of that production approval to correct that defect. If action is required to correct the defect in an existing product or article, the holder of that production approval must send the data necessary for issuing an appropriate airworthiness directive to the appropriate aircraft certification office.	
	21.137(h)	Each applicant for or holder of a production certificate must establish and describe in writing a quality system that ensures that each product and article conforms to its approved design and is in a condition for safe operation. This quality system must include: (h) <i>Nonconforming product and article control.</i> (1) Procedures to ensure that only products or articles that conform to their approved design are installed on a type-certificated product. These procedures must provide for the identification, documentation, evaluation, segregation, and disposition of nonconforming products and articles. Only authorized individuals may make disposition determinations.	
	21.137(i)	Each applicant for or holder of a production certificate must establish and describe in writing a quality system that ensures that each product and article conforms to its approved design and is in a condition for safe operation. This quality system must include: (i) <i>Corrective and preventive actions.</i> Procedures for implementing corrective and preventive actions to eliminate the causes of an actual or potential nonconformity to the approved design or noncompliance with the approved quality system.	Safety risk assessment is required under 21.137(h) and 21.137(n), as well as under 21.137(m) which requires procedures for "processing feedback." 21.137(h) addresses procedures for preventing non-conformities (an example of safety risk mitigation) and it also requires the identification evaluation, etc of nonconformities. 21.3 implies an additional obligation to make an investigation and report it to the FAA, but only upon the request of the FAA.
	21.137(m)	Each applicant for or holder of a production certificate must establish and describe in writing a quality system that ensures that each product and article conforms to its approved design and is in a condition for safe operation. This quality system must include: (m) <i>In-service feedback.</i> Procedures for receiving and processing feedback on in-service failures, malfunctions, and defects. These procedures must include a process for assisting the design approval holder to— (1) Address any in-service problem involving design changes; and (2) Determine if any changes to the Instructions for Continued Airworthiness are necessary.	
	21.137(n)	Each applicant for or holder of a production certificate must establish and describe in writing a quality system that ensures that each product and article conforms to its approved design and is in a condition for safe operation. This quality system must include: (n) Quality escapes. Procedures for identifying, analyzing, and initiating appropriate corrective action for products or articles that have been released from the quality system and that do not conform to the applicable design data or quality system requirements.	

ICAO Requirements	Regulatory References	Text	Comments/Notes
<p><b>3.1 Safety performance monitoring and measurement</b></p>	<p>21.137(g)</p> <p>21.137(l)</p>	<p>Each applicant for or holder of a production certificate must establish and describe in writing a quality system that ensures that each product and article conforms to its approved design and is in a condition for safe operation. This quality system must include: (g) <i>Inspection and test status</i>. Procedures for documenting the inspection and test status of products and articles supplied or manufactured to the approved design.</p> <p>Each applicant for or holder of a production certificate must establish and describe in writing a quality system that ensures that each product and article conforms to its approved design and is in a condition for safe operation. This quality system must include: (l) <i>Internal audits</i>. Procedures for planning, conducting, and documenting internal audits to ensure compliance with the approved quality system. The procedures must include reporting results of internal audits to the manager responsible for implementing corrective and preventive actions.</p>	<p>ICAO is looking for the organization to verify its safety performance in reference to the safety performance indicators and safety performance targets of the SMS. This should include audits, ongoing analysis of data, and monitoring the effectiveness of solutions. 21.137(g) provides the internal data collection to support this function. 21.137(l) provides internal auditing to maintain compliance to the identified safety goals of the production system</p>
<p><b>3.2 The management of change</b></p>	<p>21.137(a-b)</p>	<p>Each applicant for or holder of a production certificate must establish and describe in writing a quality system that ensures that each product and article conforms to its approved design and is in a condition for safe operation. This quality system must include: (a) Design data control. Procedures for controlling design data and subsequent changes to ensure that only current, correct, and approved data is used. (b) Document control. Procedures for controlling quality system documents and data and subsequent changes to ensure that only current, correct, and approved documents are used.</p>	<p>ICAO anticipate that there will be a process for analyzing proposed changes to the system, to make sure that the safety elements of the system will not be compromised by the change. 21.137(a) and 21.137(b) anticipate change management sufficient to ensure that data is FAA-approved and documents are current</p>
<p><b>3.3 Continuous improvement of the SMS</b></p>	<p>21.137(i)</p> <p>21.137(l)</p>	<p>Each applicant for or holder of a production certificate must establish and describe in writing a quality system that ensures that each product and article conforms to its approved design and is in a condition for safe operation. This quality system must include: (i) <i>Corrective and preventive actions</i>. Procedures for implementing corrective and preventive actions to eliminate the causes of an actual or potential nonconformity to the approved design or noncompliance with the approved quality system.</p> <p>Each applicant for or holder of a production certificate must establish and describe in writing a quality system that ensures that each product and article conforms to its approved design and is in a condition for safe operation. This quality system must include: (l) <i>Internal audits</i>. Procedures for planning, conducting, and documenting internal audits to ensure compliance with the approved quality system. The procedures must include reporting results of internal audits to the manager responsible for implementing corrective and preventive actions.</p>	<p>There are two halves to this. First, ICAO anticipates that the organization will implement a system to identify and mitigate substandard performance of the SMS (continuous improvement until SMS standards are met). The second half is about continuous improvement beyond established standards. The first half is addressed in 21.137(i) and 21.137(l), which require auditing and corrective/preventative action, but there is no regulatory element requiring continuous improvement beyond the standards of compliance. There is no regulatory element requiring continuous improvement beyond the standards of compliance. Such an element would be difficult to measure as an objective standard, and would run the risk of failing to set an objective standard for regulation, and may be considered unenforceable under the "void for vagueness" doctrine. Thus such an element may need to be omitted from the US regulations.</p>

ICAO Requirements	Regulatory References	Text	Comments/Notes
4.1 Training and education		THERE IS NO PART 21 REQUIREMENT FOR TRAINING AND EDUCATION BY A PRODUCTION APPROVAL HOLDER	ICAO anticipates identification of training needs, implementation of training (including SMS training), and assessment of effectiveness of training. Perhaps there should be a requirement that PAHs train their personnel in operation under the Hazard Identification and Risk Assessment elements of the system
4.2 Safety communication.	21.137(c)	Each applicant for or holder of a production certificate must establish and describe in writing a quality system that ensures that each product and article conforms to its approved design and is in a condition for safe operation. This quality system must include: (c) <i>Supplier control</i> . Procedures that— (1) Ensure that each supplier furnished product or article conforms to its approved design; and (2) Require each supplier to report to the production approval holder if a product or article has been released from that supplier and subsequently found not to conform to the applicable design data.	ICAO anticipates communication processes within the organization that permit the safety management system to function effectively. 21.137(c)(1) helps to ensure flow-down of information to suppliers and 21.137(c)(2) helps to ensure flow-up of hazard data from suppliers. 21.137(d) helps to ensure flow of information within the organization

**Extent of Regulatory Gap Analysis between Part 21 Productino and Design Requirements and ICAO SMS Framework**

ICAO Elements	Production			Design	
	Summary (Product Safety SMS)	Summary (Organizational factors SMS)	Summary (Product Safety SMS)	Summary (Organizational factors SMS)	
<b>1. Safety Policy</b>					
	Premise: in a production system, making a conforming product implies making a safe product. Therefore, requirements addressing the quality management system are also effective in addressing product safety.				
<b>1.1 Management commitment and responsibility</b>	No existing requirement	There is no existing requirement for a stated commitment to safety by management.	No existing requirement	No existing requirement	No existing requirement
<b>1.2 Safety accountabilities</b>	No existing requirement	21.135 requires a description of assigned responsibilities and delegated authority, and of functional relationships between those responsible for quality and management.	No existing requirement	No existing requirement	No existing requirement
<b>1.3 Appointment of key safety personnel</b>	No existing requirement	Appointment of key Quality personnel meets the intent of the requirement, in context.	No existing requirement	No existing requirement	No existing requirement
<b>1.4 Coordination of emergency response planning</b>	No existing requirement		No existing requirement	No existing requirement	No existing requirement
<b>1.5 SMS documentation</b>	No existing requirement	No existing requirement	The elements of SMS are captured in the written production system documentation, although they are not explicitly identified as such.	No existing requirement	No existing requirement
<b>2. Safety risk management</b>					
<b>2.1 Hazard identification 2.2 Safety risk assessment and mitigation</b>	Existing quality system requirements (21.137i, n) address identification, analysis and instigating corrective action for non-conforming products, and eliminating the actual and potential causes of non-conforming products or non-compliance with the quality system (equate this to SRM in the production context). The regulatory requirements do not require risk management, although individual organizations may have that process in place (MRB). There is no general regulatory requirement for prioritizing quality system response to non-conformance based on safety risk. (Special requirements apply to critical parts in CFR33).	Existing quality system requirements (21.137i) address eliminating the actual and potential causes of non-conforming products or non-compliance with the quality system (equate this to SRM in the production context). This could include organizational, human error and environmental factors.	Existing quality system requirements (21.137i) address eliminating the actual and potential causes of non-conforming products or non-compliance with the quality system (equate this to SRM in the production context). This could include organizational, human error and environmental factors.	<b>New type design complies.</b> Existing airworthiness standards require comprehensive safety analysis as part of product certification; additional SRM activities are not needed.	
				<b>COS of engines and propulsion systems complies.</b> AC 39-8 lists well-known hazards and defines a process for assessing in-service events to establish hazard level and mitigating actions.	No existing requirement

<p>3. Safety assurance</p>				<p><b>COS:</b> Other products do not have an existing requirement for product-specific hazards identified after entry into service, although non-regulatory systems are already agreed between FAA and many TC holders, and implemented.</p> <p><b>COS of all certificated products complies, in part, by 21.3</b></p> <p><b>COS for ETOPS complies</b> for some hazards (first 1/4 million hours service), as required by (21.4)</p>	
<p>3.1 Safety performance monitoring and measurement</p>		<p>Existing quality system requirements (21.137m) address defining a quality system to assure product safety and conformance, inspecting product (21.137g, measures the quality system capability), identifying quality escapes and removing them from the system or otherwise controlling their risk (21.137n), conducting internal audits to assure compliance with the QMS(21.137i) receiving and processing feedback on in-service failures, malfunctions, and defects and supporting the design approval holder in developing corrective action. (These activities equate to monitoring and measurement of the system performance - both for detected non-conformances and undetected non-conformances- in the production context). There is no regulatory requirement for a means to discriminate between the safety performance of the quality system and the overall performance of the quality system.</p>		<p><b>New Design: Complies for early-ETOPs fleet. For other fleets/products, does not comply.</b> There is no regulatory requirement (outside ETOPs) to apply the knowledge gained in monitoring safety performance back to the development of new designs.</p> <p><b>COS for engines and propulsion systems complies.</b> AC 39-8 requires verifying that corrective actions are effective</p> <p><b>COS for ETOPS complies.</b> ETOPS rule requires monitoring and measurement of fleet performance.</p> <p><b>COS for non-ETOPs, non-propulsion does not comply by an existing requirement,</b> although many organizations have measures in place to maintain their product reputation..</p>	<p>No existing requirement, although individual organizations may have measures in place.</p>

APPENDIX F: Gap Analysis, Extent of Part 21 DM and ICAO SMS Framework

March 12, 2010

<p>3.2 The management of change</p>	<p>Existing quality system requirements address design data control and change management(21.137a), production process change management (21.137d), quality system document control and change management (21.137b). Production process control change management is controlled by the quality system as a whole (maintains conformity with drawing and monitors for process degradation, identifies, addresses root cause.) There is no regulatory requirement for change management to focus on the safety effect of a change rather than the overall quality effects. There is no regulatory requirement to ensure that changes to the production process maintain compliance to the airworthiness requirements.</p>	<p>There are no existing requirements regarding change management for organizational factors.</p>	<p><b>New Design complies:</b> FAA applies issue papers or Special Conditions where they perceive novel design features. New rules are developed to manage changes in technology, operational expectations or new understanding of risks..   <b>Certification of design changes:</b>Existing regulations adequately address product changes that would affect safety (21.93, 21.101)</p>
<p>3.3 Continuous improvement of the SMS</p>	<p>21.137 i and l address continuous process improvement. This may include organizational</p>	<p>21.137 i and l address continuous process improvement. This may include organizational and environmental root</p>	<p>No requirement.</p>
<p>4. Safety promotion</p>	<p>Not applicable</p>	<p>There is no existing requirement for training and education in the QMS. Individual organizations may such commitments in place voluntarily.</p>	<p>No requirement.</p>
<p>4.1 Training and education</p>	<p>Not applicable</p>	<p>21.137c requires communication with suppliers; 21.137m requires communication with the design approval holder. There are no existing requirements regarding internal communication.</p>	<p>No requirement.</p>
<p>4.2 Safety communication.</p>	<p></p>	<p></p>	<p>No existing requirement</p>
<p></p>	<p></p>	<p></p>	<p><b>Note:</b> The above analysis applies to general requirements. Organizational delegation may require additional process elements similar to SMS elements, for parts of the delegated process.</p>

## APPENDIX G. Transport Canada's Phased-In Approach to SMS Implementation

The implementation of SMS involves a progressive development. Transport Canada is taking a phased-in approach to implementation. The four phases extend over 3 years.

Regulation In force Date	+ 90 Days	+ 1 Year	+ 2 Years	+ 3 Years
	Initial Certification	1 Year Follow up	2 Year Follow up	3 Year Follow up

### Phase 1: Initial Certification

Within 3 months of the publication of the SMS regulation, initial certification requires that applicants provide Transport Canada:

- The name of the accountable executive;
- The name of the person responsible for implementing the SMS;
- A statement of commitment to the implementation of SMS (signed by the accountable executive);
- Documentation of a gap analysis between the organization's existing system and the SMS regulatory requirements; and
- The organization's implementation project plan, based on the requirements of the exemption and the certificate holders internal gap analysis.

### Phase 2: One-Year Follow-up

At one-year, certificate holders will demonstrate that their system includes the following components:

- Documented safety management plan;
- Documented policies and procedures relating to the required SMS components; and
- A process for occurrence reporting with the associated supportive elements such as training, a method of collecting, storing and distributing data, and a risk management process.

### Phase 3: Two-Year Follow-up

Two years after initial certification, the certificate holder will demonstrate that, in addition to the components already demonstrated during Phase 2, they also have a process for the proactive identification of hazards and associated methods of collecting, storing and distributing data and a risk management process.

Required components:

- Documented safety management plan;
- Documented policies and procedures;
- Process for reactive occurrence reporting and training; and

- Process for proactive identification of hazards.

Phase 4: Three-Year Follow-up

One year following phase 3, certificate holders will demonstrate that, in addition to the components already demonstrated during phases two and three, they have also addressed:

- Training;
- Quality Assurance; and
- Emergency preparedness.

**Transport Canada’s Implementation Schedule for all Civil Aviation Organizations**

Transport Canada's vision is that SMS will be implemented in all regulated civil aviation organizations by 2015. However, SMS implementation depends on the date regulations come into force and following which will be phased in over three years. Design and Manufacturing Organizations must comply with TCCA’s SMS requirements by January 2013

CAR Part	Planned In-Force
<b>Part I</b>	<b>In-Force: May 31, 2005</b> <b>Published: June 15, 2005</b>
<b>Part III</b>	
<b>Airports (Group I)</b>	<b>In Force: January 1, 2008</b> <b>Published: December 26, 2007</b>
<b>Airports (Group II)</b>	<b>In Force: January 1, 2009</b> <b>Published: December 26, 2007</b>
<b>Water Airports</b>	January 2014
<b>Part IV</b>	
<b>Aeroplane and Helicopter Flight Training Units</b>	January 2012
<b>Part V</b>	
<b>Approved Manufacturers (561)</b>	<b>January 2013</b>
<b>Approved Maintenance Organization (AMO) (705)</b>	<b>In-Force: May 31, 2005</b> <b>Published: June 15, 2005</b>
<b>Approved Maintenance Organization (AMO) (703, 704)</b>	January 2011
<b>Approved Maintenance Organization (AMO) (702)</b>	January 2012
<b>Approved Maintenance Organizations*</b>	January 2013



(AMO) (573)	
Aircraft Certification	January 2014
Part VII	
702	January 2012
703, 704	January 2011
705	<b>In-Force: May 31, 2005</b>
	<b>Published: June 15, 2005</b>
Part VIII	<b>In Force: January 1, 2008</b>
	<b>Published: December 26, 2007</b>
<b>Updated:</b> December 22, 2009	

\* All remaining AMOs.

**Legend**

Areas highlighted in blue, in the left column, are those parts of the *Canadian Aviation Regulations* (CARs) that have completed the consultation process for the SMS Notices of Proposed Amendments (NPAs).

Areas highlighted in grey, in the left column, indicate that the consultation process has not yet started or has not yet been completed for those parts of the CARs.

Areas highlighted in yellow, indicate dates that are currently forecasted for the specified activity. The planned in-force dates are predicated on:

- The timely acceptance of NPAs by *CARAC* Technical Committees; and
- Meeting the *Canada Gazette* Part I and II timings.

In addition:

- Delays in acceptance of NPAs by the *CARAC* Technical Committee or delays in the *Canada Gazette* Part I or II activities may require that the in-force dates for specific CARs Part regulations be revised to a later date;
- A number of NPAs have not as yet been submitted to the *CARAC* process and none of the NPAs have completed the *Canada Gazette* Part I or II process; and
- All in-force dates are subject to change.

**SEC. xxx. PROTECTION OF AVIATION SAFETY INFORMATION.**

*(a) Limitation on Disclosure and Use of Information-*

*(1) IN GENERAL- Except as provided by this section, no person party may use discovery or subpoena to obtain--*

*(A) data used solely to support risk analysis or risk management performed under a Safety Management System;*

*(B) any report or data produced as a consequence of or in support of the risk assessment deliberations under a Safety Management System;*

*(C) any report created as part of a Safety Management System; or*

*(D) the results of any hazard identification or risk assessment performed as part of a Safety Management System.*

*(2) FOIA NOT APPLICABLE- Section 522 of title 5, United States Code, shall not apply to reports or data described in paragraph (1).*

*(3) EXCEPTIONS- Nothing in paragraph (1) or (2) prohibits the FAA from disclosing information contained in reports or data described in paragraph (1) if withholding the information would not be consistent with the FAA's safety responsibilities, including--*

*(A) a summary of information, with identifying information redacted, to explain the need for changes in policies or regulations;*

*(B) information provided to correct a condition that compromises safety, if that condition continues uncorrected; or*

*(C) information provided to carry out a criminal investigation or prosecution.*

*(b) PERMISSIBLE DISCOVERY - Except as provided in subsection (c), a court may allow discovery by a party of reports or data described in paragraph (1) only if, after an in camera review of the information, the court determines that the information was not necessary to the Safety Management System and was associated with the Safety Management System for no other purpose than protection of the information from disclosure.*

*(c) PROTECTIVE ORDER- When a court allows discovery, in a judicial proceeding, of reports or data described in paragraph (1), the court shall issue a protective order--*

*(1) to limit the use of the information contained in the report or data to the judicial proceeding;*

*(2) to prohibit dissemination of the report or data to any person that does not need access to the report for the proceeding; and*

*(3) to limit the use of the report or data in the proceeding to the uses permitted for privileged self-analysis information as defined under the Federal Rules of Evidence.*

*(d) SEALED INFORMATION- A court may allow reports or data described in paragraph (1) to be admitted into evidence in a judicial proceeding only if the court places the report or data under seal to prevent the use of the report or data for purposes other than for the proceeding.*

*(e) SAFETY RECOMMENDATIONS- This section does not prevent the National Transportation Safety Board from referring at any time to information contained in a Safety Management System report in making safety recommendations.*

*(f) WAIVER- Any waiver of the privilege for self-analysis information by a protected party, unless occasioned by the party's own use of the information in presenting a claim or defense, must be in writing.*

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## **Appendix I: Examples of SMS Regulatory Language and D&M Comments**

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The D&M Work Group reviewed examples of proposed or published Safety Management System regulatory language, including existing regulation from various State civil aviation authorities, as a background and reference for development of proposed regulatory language. (Note: This is not intended as a comprehensive review of international regulation). Each example was evaluated from the perspective of perceived strength and/or weakness as potential candidate language for a proposed single overarching regulation based on the following considerations: alignment with ICAO framework, simplicity efficiency and flexibility non-prescriptive and performance-based, and enforceability.

### **Contents:**

<b>Example 1: Transport Canada - SMS Regulation for Airline Operations .....</b>	<b>2</b>
<b>Example 2: EASA Proposed Amendment on SMS .....</b>	<b>4</b>
<b>Example 3: Australian Requirements for Air Operators .....</b>	<b>6</b>
<b>Example 4: Singapore (CAAS) - Regs for Maintenance Organizations .....</b>	<b>8</b>
<b>Example 5: CDO-ARC Proposal .....</b>	<b>10</b>
<b>Example 6: 8000.367 - Appendix B .....</b>	<b>12</b>
<b>Example 7: Sample U.S. Regulatory Language Based on ICAO SMS Framework .....</b>	<b>19</b>

**Example 1:**

**Transport Canada - General SMS Regulation (107.03) and specific example regulation for Airline Operations (705.152)**

**D&M WG comments:**

**- Alignment with ICAO Framework**

TC CAR 705.152 does not directly align with the ICAO Framework. The regulation includes seven required components which can be reasonably interpreted to address safety policy, hazard identification, risk management and performance monitoring, but there is not a direct correspondence to the ICAO components and elements.

**- Simplicity, efficiency, flexibility**

The TC CAR is reasonably brief but is specifically geared to an airline operator (as the regulation is specifically applicable), and as written would not be practical as a single broadly applicable regulation

**- Non-prescriptive, performance-based**

The CAR is primarily performance based but includes some prescriptive elements (for example, the internal hazard reporting policy must include “the conditions under which immunity from disciplinary action will be granted”

**- Enforceability**

The CAR is existing regulation and was written in the form of enforceable regulatory language. It would be instructive to review the experiences of Canadian operators and TC as regards to regulatory compliance efforts.

**Regulatory Language:**

**107.03** A safety management system shall include

(a) a safety policy on which the system is based;

(b) a process for setting goals for the improvement of aviation safety and for measuring the attainment of those goals;

(c) a process for identifying hazards to aviation safety and for evaluating and managing the associated risks;

(d) a process for ensuring that personnel are trained and competent to perform their duties;

(e) a process for the internal reporting and analyzing of hazards, incidents and accidents and for taking corrective actions to prevent their recurrence;

(f) a document containing all safety management system processes and a process for making personnel aware of their responsibilities with respect to them;

(g) a quality assurance program;

(h) a process for conducting periodic reviews or audits of the safety management system and reviews or audits, for cause, of the safety management system; and

(i) any additional requirements for the safety management system that are prescribed under these Regulations.

.....

**705.152 - Components of the Safety Management System**

(amended 2005/05/31; no previous version)

**(1)** The safety management system shall include, among others, the following components:

(a) a safety management plan that includes

(i) a safety policy that the accountable executive has approved and communicated to all employees,

(ii) the roles and responsibilities of personnel assigned duties under the quality assurance program established under section 706.07 or the safety management system,

(iii) performance goals and a means of measuring the attainment of those goals,

(iv) a policy for the internal reporting of a hazard, an incident or an accident, including the conditions under which immunity from disciplinary action will be granted, and

(v) a review of the safety management system to determine its effectiveness;

(b) procedures for reporting a hazard, an incident or an accident to the appropriate manager;

(c) procedures for the collection of data relating to hazards, incidents and accidents;

(d) procedures for analysing data obtained under paragraph (c) and during an audit conducted under subsection 706.07(3) and for taking corrective actions;

(e) an audit system referred to in subsection 706.07(3);

(f) training requirements for the operations manager, the maintenance manager and personnel assigned duties under the safety management system; and

(g) procedures for making progress reports to the accountable executive at intervals determined by the accountable executive and other reports as needed in urgent cases.

**(2)** The components specified in subsection (1) shall be set out in the air operator's company operations manual and maintenance control manual (MCM).

## **Example 2: EASA Proposed Amendment on SMS**

### **D&M WG comments:**

#### **- Alignment with ICAO Framework**

The proposed regulatory language in OR.GEN.200 does not fully align with the ICAO Framework outline. Item (1) safety policy does not include any subordinate elements. Item (2) reasonably addresses hazard identification and safety risk management. The remaining components (safety assurance and promotion) are not directly addressed.

#### **- Simplicity, efficiency, flexibility**

The language of OR.GEN.200 is very brief, high-level, and reasonably satisfies the necessity for simple, efficient and flexible regulation.

#### **- Non-prescriptive, performance-based**

The language is non-prescriptive and performance based, with the exception of the specific requirement for an “organization manual” and its associated contents.

#### **- Enforceability**

The language is written in a style that could reasonably be proposed as regulation.

### **EASA Proposed Regulatory Language:**

#### **EASA NOTICE OF PROPOSED AMENDMENT (NPA) No 2008-22c**

... establishing the implementing rules for the competent authorities, including general requirements, approved training organisations, aeromedical centres, licensing and medical certification of flight crew.

#### **Section 2 –Management**

##### **OR.GEN.200 Management system**

(a) An organisation shall establish and maintain a management system that includes:

- (1) a safety policy;
- (2) a process for identifying safety hazards and for evaluating and managing the associated risks;
- (3) clearly defined lines of safety accountability throughout the organisation, including a direct accountability for safety on the part of senior management;
- (4) personnel trained and competent to perform their tasks;
- (5) a process for reporting and analysing hazards, incidents and accidents and for taking corrective actions to prevent their recurrence;

(6) an organisation manual containing all management system processes, including a process for making personnel aware of their responsibilities and an amendment procedure;

(7) a function to monitor compliance of the management system with the relevant requirements and adequacy of the procedures. Compliance monitoring shall include a feedback system of findings to the accountable manager to ensure corrective action as necessary; and

(8) any additional requirements that are prescribed in this Part.

(b) The management system shall correspond to the size, nature and complexity of the activities, and the hazards and associated risks inherent in these activities.

Web address:

[http://www.easa.eu.int/ws\\_prod/r/doc/NPA/NPA%202008-22c%20-%20Part-OR.pdf](http://www.easa.eu.int/ws_prod/r/doc/NPA/NPA%202008-22c%20-%20Part-OR.pdf)

### **Example 3:**

## **Australian Government Civil Aviation Authority (CASA) SMS Requirements for Air Operators**

### **D&M WG comments:**

#### **- Alignment with ICAO Framework**

The CASA Civil Aviation Order aligns directly with the ICAO Framework outline, except for the following deviations:

- Under the Policy component, there is no reference to documentation and records, and there is reference to “relevant third party relationships and interactions”
- For operators of large aircraft, a flight data analysis program (FDAP) is required as a fifth component of the SMS

#### **- Simplicity, efficiency, flexibility**

With the exception of the additional required component (FDAP) for operators of large aircraft, the CASA Order remains at the ICAO Framework outline level, affording the greatest simplicity and flexibility.

#### **- Non-prescriptive, performance-based**

The CASA Order is non prescriptive and performance based, with the exception of the added prescriptive requirement for FDAP.

#### **- Enforceability**

The CASA order has basically converted the ICAO Framework outline language to enforceable regulatory language. It would be instructive to review the experiences of Australian operators and CASA as regards to regulatory compliance efforts.

### **CASA Regulatory Language:**

*Civil Aviation Order 82.3 Amendment Order (No. 3) 2009.*

Section 82.3 (Conditions on Air Operators' Certificates authorising regular public transport operations in other than high capacity aircraft)

...

#### **2A Safety management system**

2A.1 For this Order, a *safety management system* or *SMS* is a systematic approach to managing safety that must:

- (a) include the organisational structures, accountabilities, policies and procedures necessary to manage safety in a systematic way; and
- (b) comply with paragraph 2A.2.

2A.2 An SMS must, as a minimum, include the following:

- (a) a statement of the operator's safety policy and objectives, including documented details of the following:



- (i) the management commitment to, and responsibility for, safety risk management;
- (ii) the safety accountabilities of managers;
- (iii) the appointment of key safety personnel;
- (iv) the SMS implementation plan;
- (v) the relevant third party relationships and interactions;
- (vi) the coordination of the emergency response plan;
- (b) a safety risk management plan, including documented details of the following:
  - (i) hazard identification processes;
  - (ii) risk assessment and mitigation processes;
- (c) a safety assurance system, including documented details of the following:
  - (i) safety performance monitoring and measurement;
  - (ii) management of change;
  - (iii) continuous improvement of the SMS;
- (d) a safety promotion system, including documented details of the following:
  - (i) training and education;
  - (ii) safety communication;
- (e) for an operator who operates an aircraft with a maximum take-off weight exceeding 27 000 kg — a flight data analysis program (*FDAP*) in accordance with paragraph 2A.3.

2A.3 For subparagraph 2A.2 (e), a FDAP must:

- (a) regularly record and analyse the operational flight data of individual and aggregated operations to improve the safety of flight operations; and
  - (b) be integrated into the safety assurance system mentioned in subparagraph 2A.2 (c); and
  - (c) be supplied by:
    - (i) the operator; or
    - (ii) without in any way compromising the operator's responsibility for the existence and effectiveness of the FDAP — another appropriate person; and
  - (d) ensure that:
    - (i) except with the person's written consent or by a court order — the identity of a person who reports data to the program is protected from disclosure to anyone other than a person whose duty requires him or her to analyse operational flight data and who, therefore, has access to identity information solely for that purpose; and
- (ii) no punitive action may be taken by the operator against a person who reports data.

## **Example 4: Civil Aviation Authority of Singapore (CAAS) - SMS Regulation for Maintenance Organizations**

### **D&M WG comments:**

#### **- Alignment with ICAO Framework**

The CAAS SMS regulations for maintenance organizations are in alignment with the ICAO Framework. The regulatory language contained in SAR 145.64 requires establishment of an SMS acceptable to the authority, that:

- (1) Identifies safety hazards and assesses, controls and mitigates risks;
- (2) Ensures that remedial actions necessary to maintain an acceptable level of safety is implemented
- (3) Provides for continuous monitoring and regular assessment of the safety level achieved; and
- (4) Aims to make continuous improvement to the overall level of safety.

The regulation further specifies that the "...framework for the implementation and maintenance of a safety management system must include, as a minimum, the elements as listed in Appendix 6." The referenced appendix reproduces identically the ICAO Framework outline.

#### **- Simplicity, efficiency, flexibility**

The minimalist approach of utilizing the ICAO Framework outline provides the simplest and most flexible language.

#### **- Non-prescriptive, performance-based**

The SAR 145.64 language is sufficiently non-prescriptive and performance-based, and could reasonably serve as an example for a single overarching regulation intended to eventually apply to service providers across all sectors.

#### **- Enforceability**

The ICAO Framework Outline is written as a set of statements defining the envisioned components and elements, and is not written as enforceable regulatory language. The Singapore regulation provides enforceability by requiring an SMS acceptable to the Authority, including basic SRM and SA functions, and further requiring that the service provider's SMS "include, as a minimum, the elements as listed [in the ICAO Framework outline]..."

### **CAAS Regulatory Language:**

...

#### **SAR-145.64 Safety Management System**

(a) The SAR-145 approved maintenance organization (except Sub-part D organisations) must establish a safety management system acceptable to the Authority that:

- (1) Identifies safety hazards and assesses, controls and mitigates risks;
- (2) Ensures that remedial actions necessary to maintain an acceptable level of safety is implemented
- (3) Provides for continuous monitoring and regular assessment of the safety level achieved; and
- (4) Aims to make continuous improvement to the overall level of safety.

(b) The framework for the implementation and maintenance of a safety management system must include, as a minimum, the elements as listed in Appendix 6.

(c) A safety management system shall clearly define lines of safety accountability throughout the organization, including a direct accountability for safety on the part of the accountable manager and SAR-145.30 senior persons.

**SINGAPORE AIRWORTHINESS REQUIREMENTS  
PART 145  
SECTION 2 APPENDIX 6  
SAFETY MANAGEMENT SYSTEM FRAMEWORK ELEMENTS**

The framework for the implementation and maintenance of a safety management system should include, as a minimum, the following 4 components and 12 elements:

**Safety Policy and Objectives**

- a) Management commitment and responsibility
- b) Safety accountabilities of managers
- c) Appointment of key safety personnel
- d) Emergency response planning
- e) Documentation and records

**Safety Risk Management**

- f) Hazard identification processes
- g) Risk assessment and mitigation processes

**Safety Assurance**

- h) Safety performance monitoring and measurement
- i) Management of change
- j) Continuous improvement and audit

**Safety Promotion**

- k) Training and education
- l) Safety Communication

Note: Refer to AC 1-3 for CAAS SMS guidance materials. Reference may also be made to ICAO SMM Document 9859 for any supplementary guidance where appropriate.

**Example 5:**

**CDO-ARC Proposal**

**(Proposed regulatory language extracted from Certified Design Organization Aviation Rulemaking Committee Report to the FAA - May 2008; Page 185-186)**

**D&M WG comments:**

**- Alignment with ICAO Framework**

The proposed regulatory language contained in the CDO-ARC report aligns with the four ICAO Framework components (or ‘pillars’), but deviates at the element level

**- Simplicity, efficiency, flexibility**

The CDO-ARC language is reasonably brief, however some of the specific citations at the element level are unique to the design and manufacturing sector. The language would require some modification to be considered as a candidate for general applicability

**- Non-prescriptive, performance-based**

To the extent that the language follows the ICAO Framework, the proposed regulation is reasonably non-prescriptive

**- Enforceability**

The CDO-ARC draft SMS requirements for a CDO certificate holder are written in a manner that could reasonably be proposed as regulatory language.

**CDO-ARC Proposed Regulatory Language:**

...

**§21.729 Safety management system required of a CDO certificate holder**

A certificate holder must maintain a safety management system (SMS) that incorporates the following:

**(a) *Safety Policy* that –**

- (1) Defines the SMS goals and objectives,
- (2) Defines how the organization will implement the SMS to attain the goals and objectives of (a)(1),
- (3) Establishes senior company management's commitment to safety management and an expectation of high safety performance, and
- (4) Commits to a process-based approach to safety promotion within the company.

**(b) *Safety Risk Management* processes applied to safety systems; compliance processes; product, part, and appliance designs; and production or in-service events, that are performed as follows:**

- (1) Describe the system of interest;

- (2) Define the hazards associated with the system defined in (b)(1);
- (3) Analyze the safety risk of identified hazards, characterizing the likelihood and severity of each hazard;
- (4) Assess the safety risk and incorporate that assessment into its decision-making processes; and
- (5) Control, mitigate, or eliminate that safety risk consistent within established FAA airworthiness standards through the implementation of programs, processes, or product redesign.

**(c) *Safety Assurance*** processes that –

- (1) Monitor the implementation of the safety policy;
- (2) Assess safety systems; compliance processes; product, part, and appliance designs; and production or in-service events, to identify new or potential hazards;
- (3) Analyze those assessments as part of its risk management program; and
- (4) Continually ensure appropriate safety risk controls are effective for those hazards, based on their safety consequence and likelihood of occurrence.

**(d) *Safety Promotion*** processes that –

Implement the actions necessary to create an environment within the CDO where safety objectives can be achieved and maintained. Those actions must include –

- (1) A program to ensure people are appropriately qualified to perform the necessary safety analysis and use the SMS principles when making safety decisions,
- (2) A clear definition of what actions are acceptable and unacceptable in the workplace with respect to the reporting of safety issues,
- (3) A program for safety information sharing within the organization to ensure lessons learned are available to others doing the same or similar tasks, and
- (4) A periodic review of the safety management program to ensure that the defined processes are achieving their desired outcomes.

**Example 6:**

**8000.367 - Appendix B**

**(FAA Order VS 8000.367 - AVS Safety Management Requirements - 05-14-2008; Appendix B - Product/Service Provider SMS Requirements)**

**D&M WG comments:**

**- Alignment with ICAO Framework**

Appendix B of FAA Order 8000.367 includes the four components from the ICAO Framework outline (Policy, SRM, SA, and Promotion), but also includes far more than the twelve elements of the framework.

**- Simplicity, efficiency, flexibility**

The extensive language of the Appendix significantly exceeds the Framework outline level, preventing the necessary flexibility for application as a single overarching regulation.

**- Non-prescriptive, performance-based**

Some of the language in the Appendix is overly and unnecessarily prescriptive. For example the following citation could be interpreted to mean that the certificate management office must dictate the nature and type of documentation and records:

“The organization must maintain documents and records in accordance with document and record management policies specified by the oversight organization.”

**- Enforceability**

The appendix is written with the appropriate character and phraseology for draft proposed requirements, however the amount and detail of the language would likely create an unreasonably large burden for regulatory compliance, and would inherently result in enforceability issues.

**8000.367 Appendix B Proposed Requirements:**

*(Format changed from original)*

**Appendix B: Product/Service Provider SMS Requirements**

The following requirements are the minimum set of requirements that must be established for constituent product/service provider organizations for which AVS services have oversight responsibility.

**1. Scope and Applicability.** To be developed by the AVS service/office.

**2. References.** To be developed by the AVS service/office.

**3. Definitions.** To be developed by the AVS service, but the definitions should be consistent with existing FAA definitions and those in the AVSSMS.

**4. Policy.**

**a. General Requirements.**

(1) Safety management must be included in the entire life cycle of the organization’s outputs.

(2) The organization must promote the growth of a positive safety culture (described in Chapter 4, Section b and Chapter 7, Section a).

**b. Safety Policy.**

- (1) Top management is responsible for the organization's safety policy and its safety performance.
- (2) The safety policy must:
  - (a) include a commitment to implement and maintain the SMS;
  - (b) include a commitment to continual improvement in the level of safety;
  - (c) include a commitment to the management of safety risk;
  - (d) include a commitment to comply with applicable legal, regulatory and statutory requirements;
  - (e) include an expectation that employees will report safety issues and, where possible, provide proposals for solutions/safety improvements;
  - (f) establish clear standards for acceptable behavior;
  - (g) provide management guidance for setting safety objectives;
  - (h) provide management guidance for reviewing safety objectives;
  - (i) be communicated to all employees and responsible parties;
  - (j) be reviewed periodically to ensure it remains relevant and appropriate to the organization; and
  - (k) identify responsibility and accountability of management and employees with respect to safety performance.

**c. Quality Policy.** Top management must ensure that the organization's quality policy is consistent with the SMS.

**d. Safety Planning.** The organization must establish and maintain a safety management plan to meet the safety objectives described in its safety policy. <sup>1</sup>

**e. Organizational Structure and Responsibilities.**

- (1) Top management must have the ultimate responsibility for the SMS.
- (2) Top management must provide resources essential to implement and maintain the SMS.
- (3) Top management must designate a management official to implement and maintain the SMS.
- (4) Responsibilities for aviation safety positions, duties and authorizations must be:
  - (a) defined;
  - (b) documented; and
  - (c) communicated throughout the organization.

**f. Compliance with Legal and Other Requirements.**

- (1) The SMS must incorporate a means of compliance with FAA policy, legal, regulatory and statutory requirements applicable to the SMS.
- (2) The organization must establish and maintain a procedure to identify the current FAA policy, legal, regulatory and statutory requirements applicable to the SMS.

**g. Operational Procedures and Controls.**

- (1) The organization must establish procedures with measurable criteria to accomplish its safety policy and objectives as defined by the SMS. <sup>2</sup>
- (2) The organization must establish and maintain process controls to ensure procedures are followed for operations and activities as defined by the SMS.

**h. Emergency Preparedness and Response.**

- (1) The organization must establish a plan for response to accidents and serious incidents.
- (2) The effectiveness of the plan must be verified at intervals, either by response to real events or as an exercise.

**i. Safety Documentation and Records.**

- (1) The organization must establish and maintain information, in paper or electronic form, to describe:
  - (a) safety policies;
  - (b) safety objectives;
  - (c) SMS requirements;
  - (d) safety procedures and processes;
  - (e) responsibilities and authorities for safety procedures and processes; and
  - (f) interaction/interfaces between safety procedures and processes.
- (2) The organization must document SMS outputs in records.
- (3) The organization must maintain documents and records in accordance with document and record management policies specified by the oversight organization.

### **5. Safety Risk Management .3**

**a.** SRM must, at a minimum, include the following processes:

- (1) describe system;
- (2) identify hazards;
- (3) analyze safety risk;
- (4) assess safety risk; and
- (5) control/mitigate safety risk

**b.** The elements of the SRM process must be applied, either quantitatively or qualitatively, to:

- (1) initial designs of systems, organizations, and products;
- (2) the development of safety operational procedures;
- (3) hazards that are identified in the safety assurance functions (described in Chapter 6); and
- (4) planned changes to the production/operational system, including introduction of new products and procedures, to identify hazards associated with those changes.

**c.** The organization must establish feedback loops between assurance functions (described in Chapter 6) to evaluate the effectiveness of safety risk controls.

**d.** The organization must define a process for risk acceptance.

- (1) The organization must define acceptable and unacceptable levels of safety risk. Descriptions must be established for severity levels and likelihood levels.
- (2) The organization must define levels of management that can make safety risk acceptance decisions.

(3) The organization must define the level of safety risk that is acceptable in the short-term, while long-term safety risk control/mitigation plans are developed and implemented.

**e.** If applicable, the organization must establish procedures to obtain oversight organization approval for those planned changes that require oversight approval prior to implementation (in accordance with Chapter 4, Section f).

**f.** The safety risk of identified hazards must be deemed acceptable, prior to implementation of the following items in the production/operational system:

- (1) new system designs;
- (2) changes to existing system designs;
- (3) new operations/procedures; and
- (4) modified operations/procedures.

**g.** The SRM process may allow AVS or AVS services/offices to take interim immediate action to mitigate existing safety risk.



Figure B-1 illustrates the SRM process (described in this Chapter) and links it to safety assurance functions (described in Chapter 6). Note that this diagram is a functional depiction of the processes, not an organizational illustration. Therefore, these processes are not necessarily separate or distinct from the production/operational system; rather, the SRM process is embedded in the production/operational system. In addition, the process flow depicted can be entered at any point as circumstances require and it is not intended to suggest that the processes are necessarily linear. While the diagram and numbering system may imply that the functions are sequential; this is not necessarily the case.

*(Figure B-1 – Safety Risk Management and Safety Assurance - deleted from copy)*

**h. Describe System.** The system description must be completed to the level necessary to identify hazards. 4

**i. Identify Hazards.** Hazards must be identified within the system as described in Section h.

**j. Analyze Safety Risk.** The safety risk analysis process must include analyses of:

- (1) existing safety risk controls;
- (2) contributing factors; and
- (3) the safety risk of reasonably likely outcomes from the existence of a hazard, to include estimation of the:
  - (a) likelihood and
  - (b) severity. 5

**k. Assess Safety Risk.** Each identified hazard must be assessed for its safety risk acceptability (as defined per requirements listed in Section d).

**l. Control/Mitigate Safety Risk.**

- (1) Safety risk control/mitigation plans must be defined for hazards identified with unacceptable risk.
- (2) Substitute risk must be evaluated in the creation of safety risk controls/mitigations.
- (3) The safety risk control/mitigation must be evaluated to ensure that safety requirements have been met.
- (4) Once safety risk control/mitigation plans are implemented, they must be monitored to ensure that safety risk controls have the desired effect.

**6. Safety Assurance.** Figure B-1 illustrates how Safety Assurance functions (described in Sections b-k) are linked to the SRM process (described in Chapter 5).

**a. General Requirements.** The organization must monitor its systems, operations and products/services to:

- (1) Identify new hazards;
- (2) Measure the effectiveness of safety risk controls;
- (3) Assess compliance with legal, regulatory and statutory requirements applicable to the SMS; and
- (4) Assess conformity with organizational safety policies and procedures.

**b. Information Acquisition**

- (1) The organization must collect the data/information necessary to demonstrate the effectiveness of the SMS.
- (2) The organization must monitor operational data/information.
- (3) The organization must monitor products and services received from contractors.

**c. Employee Reporting System**

- (1) The organization must establish and maintain an employee reporting system in which

employees can report hazards, issues, concerns, occurrences, incidents, etc., as well as propose solutions/safety improvements

(2) Employees must be encouraged to use the employee reporting system without reprisal.<sup>6</sup>

**d. Investigation**<sup>7</sup>

(1) The organization must establish criteria for which accidents and incidents will be investigated.

(2) The organization must establish procedures to:

(a) investigate accidents;

(b) investigate incidents; and

(c) investigate instances of suspected non-compliance with safety regulations.

**e. Auditing of the Production/Operational System**

(1) The organization must ensure that regular audits of the production/operational system's safety functions are conducted with priority placed on the areas of highest safety risk. This obligation must extend to any contractors that the organization may use to accomplish those functions.<sup>8</sup>

(2) The organization must ensure that regular audits are conducted to:

(a) determine conformity with safety risk controls; and

(b) assess performance of safety risk controls.

(3) Auditing may be done at planned intervals or as a continuing process.

**f. Evaluation of the SMS**

(1) The organization must conduct evaluations of the SMS to determine if the SMS conforms to requirements.

(2) Evaluations may be done at planned intervals or as a continuing process.

**g. Audits by Oversight Organization.** If applicable, the organization must include the results of oversight organization audits in the data/information analyses conducted as described in Section h.

**h. Analysis of Data/Information**

The organization must analyze the data/information described in Section b.

**i. System Assessment**

(1) The organization must assess the performance of:

(a) the production/operational system's safety functions against its safety requirements as defined by the SMS and

(b) the SMS against its requirements.

(2) System assessments must result in the documentation of:

(a) conformity with existing safety risk control(s)/SMS requirement(s) (including legal, regulatory and statutory requirements applicable to the SMS);

(b) nonconformity with existing safety risk control(s)/SMS requirement(s) (including legal, regulatory and statutory requirements applicable to the SMS);

(c) potentially ineffective control(s); and

(d) potential hazard(s) found.

(3) The SRM process must be utilized if the assessment identifies:

(a) potential hazards or

(b) the need for production/operational system changes.

**j. Corrective Action.** When nonconformities are identified, the organization must prioritize and implement corrective actions.

**k. Management Reviews.**

(1) Top management must conduct regular reviews of SMS effectiveness.

(2) Management reviews must assess the need for changes to the SMS.

## **7. Safety Promotion.**

**a. Safety Culture.** Top management must promote the growth of a positive safety culture demonstrated by, but not limited to:

- (1) publication to all employees of senior management's stated commitment to safety;
- (2) communication of safety responsibilities with the organization's personnel to make each employee part of the safety process;
- (3) clear and regular communications of safety policy, goals, objectives, standards and performance to all employees of the organization;
- (4) an effective employee reporting system that provides confidentiality and de-identification as appropriate (as described in Chapter 6, Section c);
- (5) use of a safety information system that provides an accessible, efficient means to retrieve information; and
- (6) allocation of resources to implement and maintain the SMS.

## **b. Communication and Awareness**

- (1) The organization must communicate SMS outputs to its employees as appropriate.
- (2) If applicable, the organization must provide access to the SMS outputs to its oversight organization, in accordance with established agreements and disclosure programs.
- (3) The organization must ensure that affected employees and external stakeholders (including its oversight organization, if applicable) are aware of the short-term safety risk of hazards that may exist in the production/operational system while safety risk control/mitigation plans are developed and implemented (as described in Chapter 5, Section d3).

## **c. Personnel Competency**

- (1) The organization must document competency requirements for those positions identified in Chapter 4, Section e4.
- (2) The organization must ensure that individuals in the positions identified in Chapter 4, Section e4 meet the documented competency requirements.

**d. Safety Knowledge Management.** The SMS must include a process to capture knowledge of safety issues and incorporate it into future products, services and practices as appropriate.

**8. Interoperability.** The organization's SMS must be able to interoperate with other organizations' SMSs to manage cooperatively issues of mutual concern.

## Footnotes:

<sup>1</sup> Safety planning is a component of safety management that is focused on setting safety objectives and specifying necessary operational processes and related resource requirements to fulfill those objectives.

<sup>2</sup> Measures are not expected for each procedural step. However, measures and criteria should be of sufficient depth and level of detail to ascertain and track the accomplishment of objectives. Criteria and measures can be expressed in either quantitative or qualitative terms.

<sup>3</sup> In general, the extent and structure of safety risk assessment that is necessary will be greater when the item/issue to be assessed is more complex and effects of the hazards are more severe. The intent of the SRM process is to focus on the areas of greatest concern from a safety perspective, taking into account safety risk, complexity, operational scope (impact to the air transportation system), etc.

<sup>4</sup> While it is recognized that identification of every conceivable hazard is impractical, organizations are expected to exercise diligence in identifying and controlling significant and reasonably foreseeable hazards related to their operations. Describing the system involves the act of bounding the system (i.e., defining what the system actually is). The definition process is a purely subjective one. Defining a system requires a definition of its boundary and its components.

<sup>5</sup> Severity and likelihood may be expressed in qualitative or quantitative terms.

<sup>6</sup>This does not restrict management from taking action in cases of gross negligence or willful operation outside the organization's safety requirements.

<sup>7</sup>It is understood that not all organizations have the ability to directly investigate accidents and incidents for relevance to their products/services (e.g., organizations that provide air traffic management systems or subsystems). Therefore, in this case the organization should use the results of investigations conducted by other entities.

<sup>8</sup>The organization can choose to conduct audits of its contractors or require that contractors conduct their own audits and provide the resultant data/information to the organization.

## **Example 7: Sample U.S. Regulatory Language Based on ICAO SMS Framework**

### **- Alignment with ICAO Framework**

The draft language (identified as new proposed Part 195) aligns with the four ICAO Framework outline components. It aligns with the twelve outline elements except under Safety Policy where there is slight deviation in that the element regarding documentation and records is not explicitly included, and a requirement for internal reporting procedures is added.

### **- Simplicity, efficiency, flexibility**

The proposed language generally remains at the framework outline level. The component and element descriptive statements are converted to the form of requirements language, thereby approaching the simplest practical concept for proposed regulation, and allowing the greatest flexibility.

### **- Non-prescriptive, performance-based**

The language is generally non-prescriptive, simply requiring the regulated entity to have a procedure to address the required elements.

### **- Enforceability**

The draft provides an example of reasonably enforceable language based directly on the ICAO Framework outline.

## **DRAFT Sample U.S. SMS Regulatory Language Based on ICAO Framework**

Title 14  
Chapter 1  
Subchapter L [new]  
Part 195

### **195.1 Safety Management System**

- (a) This Part applies to any person that is required, under this Chapter, to have a safety management system.
- (b) The procedures described in this Part shall be known, collectively, as a safety management system.
- (c) A person required by this Chapter to have a safety management system may incorporate some, none or all of its procedures in any other manual or collection of procedures maintained by the person.
- (d) Where the procedures required under this part are substantially similar to procedures required by other regulations, a single procedure may meet the requirements of two or more requirements.

- (e) The procedures required by this part will reflect the size, culture, special operating requirements and business practices of the party implementing the safety management system, and therefore may differ among similarly situated persons based on the differing practices of each person.

### 195.3 Definitions

- (a) Regulated Party, for purposes of this Part, means a person who is required by this Chapter to have a safety management system.

### 195.5 Safety Policy

The Regulated Party shall have the following Safety Policy data and procedures:

- (a) An internal procedures for reporting safety issues;
- (b) A procedure for periodic review of the safety policy and objectives, to ensure that they remain relevant and appropriate to the organization
- (c) An organizational chart that identifies, the title, duties and responsibilities of
  - (1) the Accountable Manager who is responsible for the implementation and maintenance of the SMS;
  - (2) each management person who has authority to make decisions regarding safety risk tolerability;
  - (3) each management person who is accountable for implementing safety policy
  - (4) each management person who is accountable for ensuring that safety policy is implemented
- (d) A procedure for appointing the Accountable Manager;
- (e) Where emergency response procedures are necessary, procedures for
  - (1) transitioning from normal to emergency operations, and returning to normal operations,;
  - (2) coordination of emergency response planning;
- (f) A description of the safety policy, safety objectives, safety performance indicators and safety performance targets of the Regulated Party;

### 195.7. Safety risk management

The Regulated Party shall have the following Safety Risk Management procedures:

- (a) A procedure for collecting safety data and identifying aviation safety hazards associated with the Regulated Party's operations
- (b) A procedure for reviewing aviation safety hazards associated with the Regulated Party's operations and identifying appropriate controls of the aviation safety risks posed by each aviation safety hazard.

#### 195.9 Safety assurance

The Regulated Party shall have the following Safety Assurance procedures:

- (a) A procedure for verifying the safety performance of the organization and validating the effectiveness of the safety risk controls in reference to the safety performance indicators and safety performance targets of the Safety Policy.
- (a) A procedure for managing change within the organization to assure that change does not adversely affect safety performance
- (b) A procedure for using safety data to improve the Regulated Party's Safety Management System

#### 195.11 Safety promotion

The Regulated Party shall have the following Safety Promotion procedures:

- (a) A procedure for training the Regulated Party's safety-related personnel to assure that they are competent to perform their SMS duties.
- (b) A procedure for safety communication that ensures
  - (1) that all safety-related personnel are fully aware of the Regulated Party's safety management system, and
  - (2) that the Regulated Party's safety information is conveyed to appropriate personnel.

**APPENDIX D – SMS ARC MEMBERS, WORK GROUP PARTICIPANTS, AND SUPPORT**

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## SMS ARC MEMBERS, WORK GROUP PARTICIPANTS, AND SUPPORT

SMS ARC Tri-Chairs			
Last Name	First Name	Organization	Membership Status
Johns	Tom	Boeing	Tri-Chair, D&M WG
Madar	Al	American Airlines	Tri-Chair, M WG
Orlady	Linda	Air Line Pilots Association, International (ALPA)	Tri-Chair, O&T WG

SMS ARC Tri-Chair Alternates			
Last Name	First Name	Organization	Membership Status
Edmunds	Bill	Air Line Pilots Association, International (ALPA)	Tri-Chair Alt, O&T WG
Jette	Helynne	Bombardier Aerospace	Tri-Chair Alt, D&M WG
Smith	Mont	Air Transport Association (ATA)	Tri-Chair Alt, O&T WG

SMS ARC Members			
Last Name	First Name	Organization	Membership Status
Desrosier	Walter	General Aviation Manufacturers Association (GAMA)	ARC, D&M WG Lead
Dickstein	Jason	Modification and Replacement Parts Association (MARPA) & Aircraft Electronics Association (AEA)	ARC, D&M WG
Hawthorne	Paul	Aeronautical Repair Station Association (ARSA)	ARC, M WG Lead
Hazlet, Jr.	John W.	Regional Air Cargo Carriers Association (RACCA)	ARC, O&T WG
Heffernan	J.	Helicopter Association International (HAI)	ARC, O&T WG
Lawton	Russ	National Air Transportation Association (NATA)	ARC, O&T WG
Lotterer	Dave	Regional Airline Association (RAA)	ARC, O&T WG
Mahone	Bruce L.	SAE International	ARC, D&M WG
Peri	Ric	Aircraft Electronics Association (AEA)	ARC, M WG
Prewitt	Dave	Rotorcraft Leasing Company, LLC	ARC, O&T WG Lead
Smith	Mont	Air Transport Association (ATA)	Tri-Chair Alt, ARC, O&T WG
Young	Bob	Aerospace Industries Association (AIA)	ARC, M WG

SMS ARC Operations & Training (O&T) Work Group Participants			
Last Name	First Name	Organization	Membership Status
Anthony	Thomas	University of Southern California	O&T WG
Beach	Brian	Allied Pilots Association (APA) & Coalition of Airline Pilots Associations (CAPA)	O&T WG (Back-up)
Bechdolt	Stacey	Attorney	O&T WG
Berner	Mark	Comair, Inc.	O&T WG
Briner	Steven	Comair, Inc.	O&T WG
Carr	Douglas	National Business Aviation Association (NBAA)	O&T WG

## SMS ARC MEMBERS, WORK GROUP PARTICIPANTS, AND SUPPORT

SMS ARC Operations & Training (O&T) Work Group Participants			
Last Name	First Name	Organization	Membership Status
DeLashmutt	Morgan	Executive Flight, Inc.	O&T WG
DeLeeuw	John F.	Allied Pilots Association	O&T WG
Edmunds	Bill	Air Line Pilots Association, International (ALPA)	Tri-Chair Alt, O&T WG
Etheridge	Fred	Gulfstream Aerospace Corporation	O&T WG
Faddis	Dave	SkyWest Airlines	O&T WG
Fell	Ed	Pinnacle Airlines	O&T WG
Gless	Robert F.	Transport Workers Union of America (TWU)	O&T WG (Back-up)
Grace	Daniel	Cessna Aircraft Company	O&T WG
Hazlet, Jr.	John W.	Regional Air Cargo Carriers Association (RACCA)	ARC, O&T WG
Heffernan	J.	Helicopter Association International (HAI)	ARC, O&T WG
Lawton	Russ	National Air Transportation Association (NATA)	ARC, O&T WG
Lotterer	Dave	Regional Airline Association (RAA)	ARC, O&T WG
Keinath	Chris	Horizon Air	O&T WG
Kvassay	Alex	Clay Lacy Aviation	O&T WG
Lange	William	Compass Airlines	O&T WG
Massoni	Michael	Transport Workers Union of America (TWU)	O&T WG
McCune	Dan	Embry Riddle University	O&T WG
McNeely	Steven	Jet Solutions, L.L.C	O&T WG
Michaelis	Mike	Allied Pilots Association (APA)	O&T WG (Back-up)
Nutter	Chris	Alaska Airlines	O&T WG
Orlady	Linda	Air Line Pilots Association, International (ALPA)	Tri-Chair, O&T WG
Pellicone	John (Jay)	Allied Pilots Association (APA)	O&T WG
Peterson	Dale	Alaska Airlines	O&T WG
Prewitt	Dave	Rotorcraft Leasing Company, LLC	ARC, O&T WG Lead
Ramakrishna	Bunty	Delta Air Lines	O&T WG
Rickerhauser	Don	Bombardier Flexjet	O&T WG
Rugarber	Robert	Boeing Commerical Airplane Company	O&T WG
Ryan	David	Air Line Pilots Association, International (ALPA)	O&T WG
Seals	Kenneth	Avjet Corporation	O&T WG
Seemel	Nick	Air Line Pilots Association, International (ALPA)	O&T WG
Shults	Gary L.	Transport Workers Union of America (TWU)	O&T WG
Siewert	Dana	University of North Dakota	O&T WG
Smith	Mont	Air Transport Association (ATA)	Tri-Chair Alt, O&T WG
Starkey	Charles	Flight Options, LLC	O&T WG
Stephens	Les	Atlantic Southeast Airlines	O&T WG
Tudor	Ben	Air Line Pilots Association, International (ALPA)	O&T WG
van Soestbergen	Harry J	UTRS, Inc.	O&T WG

## SMS ARC MEMBERS, WORK GROUP PARTICIPANTS, AND SUPPORT

<b>SMS ARC Maintenance (M) Work Group Participants</b>			
<b>Last Name</b>	<b>First Name</b>	<b>Organization</b>	<b>Membership Status</b>
Brugger	Brad	Transport Workers Union of America (TWU)	M WG
Burgess	Paul	Bombardier Services Corporation	M WG
Dodd, Jr	Leon P.	StandardAero	M WG
Erickson	Chris	Erickson Air-Crane Inc.	M WG
Farmiga	Sam	GE Aviation	M WG
Gagnon	Ed	Dassault Falcon Jet	M WG
Galarza	Jose	Transport Workers Union of America (TWU)	M WG
Gass	Mike	Rockwell Collins	M WG
Hawthorne	Paul	Aeronautical Repair Station Association (ARSA)	ARC, M WG Lead
Hodge	Dan	American Airlines	M WG
Jurich	Marty	Cessna Aircraft Company	M WG
Klein	Matthew	United Airlines	M WG
Mabe	Bob	TIMCO Aviation Services	M WG
Madar	Al	American Airlines	Tri-Chair, M WG
Manley	Patrick	Gulfstream Aerospace Corporation	M WG
Miller	Joe	Delta Air Lines TechOps	M WG
Nakahara	Lori	Boeing Commercial Airplane Company	M WG
Peri	Ric	Aircraft Electronics Association (AEA)	ARC, M WG
Ruggieri	Rocky	FedEx Express	M WG
Sirico	Joe	Pratt & Whitney	M WG
Summers	Harold	Helicopter Association International (HAI)	M WG
Whittier	Stephen	Bombardier Services Corporation	M WG
Wood	Jeffrey D.	Boeing Commercial Airplane Company	M WG
Young	Bob	Aerospace Industries Association (AIA)	ARC, M WG

## SMS ARC MEMBERS, WORK GROUP PARTICIPANTS, AND SUPPORT

<b>SMS ARC Design &amp; Manufacturing (D&amp;M) Work Group Participants</b>			
<b>Last Name</b>	<b>First Name</b>	<b>Organization</b>	<b>Membership Status</b>
Bartron	Michael	Pratt & Whitney	D&M WG
Beck	Anthony	Gulfstream Aerospace Corporation	D&M WG
Cummins	Mike	Honeywell International	D&M WG
Desrosier	Walter	General Aviation Manufacturers Association (GAMA)	ARC, D&M WG Lead
Dickstein	Jason	Modification and Replacement Parts Association (MARPA) & Aircraft Electronics Association (AEA)	ARC, D&M WG
Durkin	Chris	Honeywell International	D&M WG
Jette	Helynn	Bombardier Aerospace	Tri-Chair Alt, D&M WG
Johns	Tom	Boeing	Tri-Chair, D&M WG
Kerr	John S.	Bell Helicopter Textron Inc.	D&M WG
Kihm	Doug	Boeing	D&M WG
Knife	Sarah	GE Aviation	D&M WG
Mahone	Bruce L.	SAE International	ARC, D&M WG
Picou	Gary	PS Engineering, Inc.	D&M WG
Thompson	Dean	Hawker Beechcraft Corporation	D&M WG
Welch	William B. (Buck)	Cessna Aircraft Company	D&M WG
Williams	Rex	Bombardier Learjet	D&M WG

<b>SMS ARC – FAA Support</b>			
<b>Last Name</b>	<b>First Name</b>	<b>Organization</b>	<b>Membership Status</b>
Arendt	Don	Federal Aviation Administration (FAA)	FAA Support to O&T WG
Krens	Rick	Federal Aviation Administration (FAA)	FAA Support to M WG
Reinert	Mike	Federal Aviation Administration (FAA)	FAA Support to D&M WG
Van Buren	Scott	Federal Aviation Administration (FAA)	Designated Federal Official for SMS ARC



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Part VI

## Department of Transportation

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Federal Aviation Administration

14 CFR Parts 5 and 119

Safety Management Systems for Domestic, Flag, and Supplemental  
Operations Certificate Holders; Final Rule

**DEPARTMENT OF TRANSPORTATION****Federal Aviation Administration****14 CFR Parts 5 and 119**

[Docket No. FAA-2009-0671; Amendment Nos. 5-1 and 119-17]

RIN 2120-AJ86

**Safety Management Systems for Domestic, Flag, and Supplemental Operations Certificate Holders**

**AGENCY:** Federal Aviation Administration (FAA), Department of Transportation (DOT).

**ACTION:** Final rule.

**SUMMARY:** This final rule requires each air carrier operating under 14 CFR part 121 to develop and implement a safety management system (SMS) to improve the safety of its aviation-related activities. SMS is a comprehensive, process-oriented approach to managing safety throughout an organization. SMS includes an organization-wide safety policy; formal methods for identifying hazards, controlling, and continually assessing risk and safety performance; and promotion of a safety culture. SMS stresses not only compliance with technical standards but also increased emphasis on the overall safety performance of the organization.

**DATES:** This final rule becomes effective March 9, 2015.

**FOR FURTHER INFORMATION CONTACT:**

Scott Van Buren, Chief System Engineer for Aviation Safety, Office of Accident Investigation and Prevention (AVP), Federal Aviation Administration, 800 Independence Avenue SW., Washington, DC 20591; telephone: (202) 494-8417; facsimile: (202) 267-3992; email: [scott.vanburen@faa.gov](mailto:scott.vanburen@faa.gov). For legal questions, contact Alex Zektser, Regulations Division, Office of the Chief Counsel, Federal Aviation Administration, 800 Independence Avenue SW., Washington, DC 20591; telephone: (202) 267-3073; facsimile: (202) 267-7971; email: [alex.zektser@faa.gov](mailto:alex.zektser@faa.gov).

**SUPPLEMENTARY INFORMATION:**

**I. Authority for This Rulemaking**

The Federal Aviation Administration's (FAA) authority to issue rules on aviation safety is found in Title 49 of the United States Code. This rulemaking is promulgated under the authority described in 49 U.S.C. 106(f), which establishes the authority of the Administrator to promulgate regulations and rules and 49 U.S.C. 44701(a)(5), which requires the Administrator to promulgate regulations and minimum

standards for other practices, methods, and procedures necessary for safety in air commerce and national security.

In addition, the Airline Safety and Federal Aviation Administration Extension Act of 2010 (the Act), Public Law 111-216, sec. 215 (August 1, 2010), required the FAA to conduct rulemaking to "require all 14 CFR part 121 air carriers to implement a safety management system." The Act required the FAA to issue this final rule within 24 months of the passing of the Act (July 30, 2012).

**Table of Contents**

- I. Overview of the Final Rule
- II. Summary of the Costs and Benefits of the Final Rule
- III. Background
  - A. Summary of NPRM
  - B. Summary of Comments
- IV. Discussion of Final Rule and Comments
  - A. Scalability
  - B. Scope and Definition of Hazard
  - C. Protection of Information/Data From Disclosure Under Freedom of Information Act (FOIA)
  - D. Enforcement
  - E. Scope of SMS and Compliance With Administrative Procedure Act
  - F. Duplicative Rulemaking
  - G. Credit for Pilot Project/Participants and Adoption of Third Party/Accredited SMS
  - H. Applicability, Subpart A—Implementation Plans
    - I. Subpart B, Safety Policy—Designation of a Single Accountable Executive and Sufficient Safety Management Personnel
    - J. Subpart C, Safety Risk Management (SRM)
    - K. Subpart D, Safety Assurance
    - L. Subpart F, Recordkeeping and Documentation Requirements
    - M. Flow-Down of Requirements
    - N. FAA Capability To Manage Oversight
    - O. Guidance Material
    - P. Determination of Acceptable Levels of Safety
    - Q. Performance Based v. Process Based Regulation
    - R. Employee Reporting Systems
  - V. Regulatory Notices and Analyses
  - VI. Executive Order Determinations
  - VII. How To Obtain Additional Information

**I. Overview of the Final Rule**

This final rule requires air carriers authorized to conduct operations under 14 Code of Federal Regulations (CFR) part 121 (part 121) to develop and implement a safety management system (SMS) to improve the safety of their aviation-related activities. SMS includes an organization-wide safety policy; formal methods for identifying hazards, controlling, and continually assessing risk; and promotion of a safety culture. When systematically applied, SMS provides a set of decision-making tools that air carriers can use to improve safety. SMS improves safety by addressing underlying organizational

issues that may result in accidents or incidents.

This final rule is part of the FAA's efforts to continuously improve safety in air transportation by filling gaps through improved management practices. SMS's proactive emphasis on hazard identification and mitigation, and on communication of safety issues, will provide air carriers with robust tools to improve safety. Congress, in the Airline Safety and Federal Aviation Administration Extension Act of 2010 (Pub. L. 111-216, August 1, 2010), directed the FAA to issue a notice of proposed rulemaking within 90 days of enactment, and a final SMS rule by July 30, 2012. In addition, the National Transportation Safety Board (NTSB) has recommended the FAA pursue rulemaking to require all part 121 operators to implement an SMS. Further, the International Civil Aviation Organization (ICAO), in its March 2006 amendments to Annex 6 part I, which addresses operation of airplanes in international commercial air transport, established a standard for member states to mandate that each air carrier establish an SMS. This regulation will comply with the statutory requirement, fully address the NTSB recommendation, and harmonize U.S. requirements with ICAO standards for air carriers operating under part 121.

While the commercial air carrier accident rate in the United States has decreased substantially over the past 10 years, the FAA has identified a recent trend involving hazards that were revealed during accident investigations. The FAA's Office of Accident Investigation and Prevention identified 123 accidents involving part 121 air carriers from fiscal year (FY) 2001 through FY 2010 for which identified causal factors could have been mitigated if air carriers had implemented an SMS to identify hazards in their operations and developed methods to control the risk.<sup>1</sup> This type of approach allows air carriers to anticipate and mitigate the likely causes of potential accidents. This is a significant improvement over current "reactive" safety action emphasis, which focuses on discovering and mitigating the cause of an accident only after that accident has occurred. In order to bring about this change in accident mitigation, as well as the other reasons discussed throughout this document, the FAA is requiring part 121

<sup>1</sup> Initially, the analysis identified 172 accidents, but this number was based on comments to the notice of proposed rulemaking. The accident analysis is discussed further in the Final Regulatory Evaluation.

air carriers to develop and implement an SMS.

The requirements in this rule function as follows. Air carriers authorized to conduct operations under part 121 must develop and implement an SMS within 3 years of the effective date of the final rule. To demonstrate that the air carrier's SMS will be fully implemented by the end of this three-year period, the air carrier will be required to submit an implementation plan within 6 months of the effective date of the final rule. The implementation plan should include any existing programs, policies or procedures the air carrier intends to include in its SMS, such as continuing analysis and surveillance systems, aspects of quality management systems, and employee reporting systems. This implementation plan must be approved by the FAA within 12 months of the effective date of the final rule.

The air carrier's SMS must contain the following four major components: Safety policy, safety risk management, safety assurance, and safety promotion. To satisfy the safety policy component, the air carrier must establish a policy which, among other things, defines the air carrier's safety objectives and commitment toward achieving those objectives. The air carrier will also be required to designate an accountable executive who is ultimately responsible for the safety performance of its operations, as well as sufficient

management personnel who will be responsible for the coordination, implementation, and maintenance of the SMS, as well as integration of SMS processes across the air carrier.

Under safety risk management, air carriers must develop processes to analyze existing and potential systems and use the resulting system analyses to identify hazards that may impact the air carrier's aviation operations.<sup>2</sup> Air carriers will then analyze the risk of a consequence arising from the hazard occurring and determine if the associated safety risk is acceptable. If it is not acceptable, the air carrier must develop risk controls for implementation.

Through safety assurance, the air carrier will develop and implement processes to monitor the safety performance of its aviation operations. The processes must include means to monitor and audit operational processes, investigate incidents and accidents, and allow for confidential employee reporting of hazards as well as proposing solutions for safety improvement. The air carrier will also conduct evaluations regarding its safety performance to review the effectiveness of risk controls that are implemented as well as to identify any changes in the operational environment that may introduce new hazards.

Under safety promotion, air carriers will be required to train their employees

(including managers) and develop the tools to communicate necessary safety information. Involvement of the air carriers' employees is essential to the success of its SMS. The employees must be properly informed of their responsibilities and trained regarding their duties relevant to the safety performance of the air carrier. In addition, they must be made aware of necessary safety information resulting from the various SMS analyses.

**II. Summary of the Costs and Benefits of the Final Rule**

This rule requires part 121 air carriers (domestic, flag, and supplemental operations) to establish an SMS. SMS is a tool designed to help air carriers effectively integrate formal risk control procedures into normal operational practices to improve safety for all part 121 air carriers. It is expected that the requirements of the rule will help airlines to identify safety problems, and if airlines take steps to mitigate these problems it is estimated that the benefits from that mitigation could be between \$205.0 and \$472.3 million over 10 years (\$104.9 to \$241.9 million present value at 7 percent discount rate). Costs of the rule's provisions (excluding any mitigation costs, which have not been estimated) are estimated to be \$224.3 million (\$135.1 million present value at 7 percent discount rate) over 10 years.

**ESTIMATED COSTS AND BENEFITS FOR ALL PART 121 CARRIERS—2014–2023**  
 [Millions of 2010 dollars \* (discounted at 7% discount rate)]

Costs .....	Rule Implementation Costs: \$135.1.
	Mitigation Costs: Not quantified, estimates not included.
Benefits from Provisions of the Rule and any Consequent Safety Mitigation Actions**	\$104.9–\$241.9.

\* Table values have been rounded. Totals may not add due to rounding.

\*\* Given the range of mitigation actions possible, it is difficult to quantify potential benefits. This range reflects the potential benefits resulting from examples of possible mitigation actions.

**III. Background**

*A. Summary of NPRM*

On November 5, 2010, the FAA published a notice of proposed rulemaking (NPRM) on SMS for part 121 certificate holders (75 FR 68224). In the NPRM, the FAA proposed to require these certificate holders to develop and implement an SMS to improve the safety of their aviation related activities. In response to several commenters' requests, the comment period was extended and ultimately closed on March 7, 2011.

*B. Summary of Comments*

The FAA received 69 comment documents in response to the NPRM from a variety of commenters, including air carriers, aircraft designers and manufacturers, trade associations, emergency medical transport services, a non-profit safety organization, a university, and private citizens. Commenters included Aerospace Industries Association (AIA)/General Aviation Manufacturers Association (GAMA), Air Charter Safety Foundation (ACSF), Aircraft Electronics Association

(AEA), Aircraft Owners and Pilots Association (AOPA), Air Line Pilots Association, International (ALPA), Air Medical Operators Association (AMOA), Air Transport Association of America, Inc.<sup>3</sup> (ATA), American Association for Justice (AAJ), Association of Air Medical Services (AAMS), Association of Flight Attendants (AFA), Communications Workers of America, AFL–CIO, Aviation Safety Council of Alaska (ASCA), Aviation Suppliers Association (ASA), The Boeing Company (Boeing), Bombardier Inc.

<sup>2</sup> Hazards may also be identified through safety assurance functions, as well as by analyzing a proposed change to the air carrier's system.

<sup>3</sup> As of December 1, 2011, the ATA changed its name to Airlines for America (A4A).

(Bombardier), Cargo Airline Association (CAA), Cessna Aircraft Company (Cessna), Clark County (Nevada) Department of Aviation (CCDOA), Delta Air Lines, Inc. (Delta), DTI Training Consortium (DTI Training), Experimental Aircraft Association (EAA), FedEx Express (FedEx), Futron Corporation (Futron), GE Aviation (GE), Gener Ibita Topacio, Hawker Beechcraft Corporation (Hawker Beechcraft), Helicopter Association International (HAI), JetBlue Airways (JetBlue), Modification and Replacement Parts Association (MARPA), National Air Carriers Association (NACA), National Air Transportation Association (NATA), National Transportation Safety Board (NTSB), Omni Air International (Omni Air), Pinnacle Airlines Corp. (Pinnacle), Regional Airline Association (RAA), Rockwell Collins Inc. (Rockwell Collins), Southwest Airlines (SWA), StandardAero, True-lock, United Parcel Service Co. (UPS), United Technologies Corporation (UTC), University of Southern California (U.S.C.), School of Engineering, the U.S. Small Business Administration's (SBA) Office of Advocacy, and 24 individuals.

#### IV. Discussion of Final Rule and Comments

The FAA is adopting the final rule, as proposed, with minor modifications based on the comments discussed below. The rule requires part 121 certificate holders to submit a plan for implementation of SMS and fully implement an SMS within 3 years of the effective date of the final rule.

##### A. Scalability

The SBA raised concerns about the scalability of this rule and its impact on small business entities. The SBA, along with True-lock, AEA, MARPA, and ASA, indicated that this rule would be too costly for small businesses to implement. The SBA suggested limiting the final rule to incident management, strategic decision-making, and notification of incidents to the FAA.

The FAA has decided not to limit this rule as suggested by the SBA because adopting the SBA's proposal would only partially enact the safety assurance component and none of the other requirements that the FAA considers to be necessary for an effective SMS. The four parts of an SMS (safety policy, safety risk management, safety assurance, and safety promotion) work together to stress management accountability and decision-making based on forward looking hazard identification and mitigation of risks, rather than a retrospective review of conditions that have already caused

accidents and incidents. The four components working together provide the tools necessary to allow strategic decision-making.

However, the FAA recognizes the perceived impact that this rule may have on small businesses. As of January 6, 2012, there were 90 part 121 certificate holders. The size, scope, and complexity of the operations of each of these certificate holders vary greatly. For example, a third of the part 121 certificate holders have 10 or fewer airplanes, while 10% have more than 270 airplanes.

Given the variance in these types of operations, the FAA designed these requirements to be applicable to air carriers of various sizes, scopes, and complexities, as well as adaptable to fit the different types of organizations in the air transportation system and operations within an individual air carrier. The FAA does not anticipate, nor expect, that small air carriers would require an SMS as complex as one for large air carriers. To further clarify this issue, the FAA has revised 14 CFR 5.3 in the final rule to state that the SMS must be appropriate to the size, scope, and complexity of the certificate holder's operations. As such, it is scalable to the size of a small entity.

The FAA has also revised the guidance material that was published for comment with the NPRM. The revised guidance material provides a variety of examples of how to implement the SMS processes and procedures that an air carrier may develop based on the size, scope, and complexity of its operation. The examples outlined in the guidance material are not intended to limit an air carrier to only these methods of compliance. The following outlines different approaches, based on processes and procedures developed by air carriers participating in the Flight Standards Service (AFS) Voluntary SMS Pilot Project ("Pilot Project"), which may be adapted to fit the operational needs of an air carrier based on the size of its operation.<sup>4</sup>

Larger air carriers participating in the Pilot Project typically use their existing divisional structures as a foundation for SMS management. The flight safety organization or equivalent provides a source of standardization, oversight, and reporting directly to a corporate accountable executive. Each division typically establishes a management review process with a committee

chaired by the most senior manager (generally a senior vice president) in the division. This senior manager may be one of the management personnel that is already required of an air carrier conducting operations under part 121 under 14 CFR 119.65. These committees are most often supported by a staff-level working group that attends to day-to-day safety management functions, and advises the senior management committee. These working groups are usually made up of existing safety and quality assurance personnel, along with representatives from the functional areas within the division. They are, in turn, supported by the members of the flight safety organization which may also manage corporate level data management and analysis functions. To provide coordination and integration across the air carrier, most large air carriers have a corporate level committee made up of the division managers and including the most senior managers in the air carrier (e.g., Chief Executive Office, President, Chief Operating Officer).

Using this framework, a large air carrier has established a team of sufficient management personnel responsible for the daily oversight of SMS and communication to the accountable executive, to ensure that informed decisions regarding the safety performance of the air carrier's operations are being made. This existing framework can be used to satisfy the management structure requirements in this final rule.

At medium size air carriers, the decision making and information process flows are similar to those of larger air carriers, but the supporting functions are often integrated under the Director of Safety. These structures are similar to what are traditionally used to accomplish the requirements of an independent evaluation program (IEP), which most part 121 air carriers already have in place.<sup>5</sup>

At small air carriers, there will likely not be the multiple tiers of decision making and structures that exist in larger air carriers. For small air carriers, convening ad hoc committees might be an appropriate SMS mechanism. In these cases, the Director of Safety may be the sole support staff available. Using the Director of Safety in this capacity

<sup>4</sup> The Pilot Project was established for operators to develop implementation SMS strategies and oversight interfaces necessary for SMS, as well as gain experience for FAA and operators regarding SMS implementation.

<sup>5</sup> IEP is a comprehensive program for evaluating an air carrier's operational systems as well as its assurance programs. It builds on the auditing programs of the internal audit function and provides management with an additional level of assurance that is independent of the operational sub-organizations' audits and reviews. IEPs provide many of the auditing and evaluation safety assurance processes required in the rule.



would be an acceptable means of compliance with the management structure requirements of this final rule for a small air carrier.

Another example of scalability stems from management's need for continued access to information about the air carrier's operational processes. Larger air carriers may, as part of safety assurance, have full time safety and quality auditors who conduct internal audits, or, particularly in smaller divisions, these audits may be performed by personnel from inside the divisions as collateral duties. In addition, automated data entry, record keeping, retrieval, and analysis are nearly universal at larger air carriers. Software may be developed by or for the air carrier, or may be selected from a variety of specialty safety and quality system software providers. Larger air carriers typically also have specialized information technology (IT) staffs that may be used to monitor and complete the recordkeeping requirements of the final rule.

Managers of medium to small air carriers certainly need the same type of information to make decisions. Typically, though, the volume of information is smaller because the operation is smaller and not as complex. The frequency of the air carrier's operations may also affect the rate at which information must be updated and audits must be conducted. Medium and small air carriers often purchase uniform software packages sold by third parties rather than invest in custom-built packages that require hiring in-house staffers to implement, design, and maintain the software. Very small air carriers may use basic desktop software (e.g., spreadsheet and basic database products) to track information. Smaller air carriers often use line personnel to perform audits as a collateral duty. Analysis of individual audits typically is performed as part of the auditing activity with trend analysis being done by the Director of Safety and, if available, safety and quality staff. Using these existing tools are acceptable means of compliance with the requirements of this final rule.

Another example of the scalability of SMS can be seen in the employee reporting system required by this rule. The FAA anticipates that smaller air carriers will have to deal with significantly fewer reports from the employee reporting system than larger air carriers. Also, larger air carriers are more likely to satisfy this requirement through one or more aviation safety action programs' (ASAP) employee group applications. These systems for large employee groups might be more

costly than the minimum requirements imposed by this rule. ASAP is an employee reporting system that air carriers may use to gather information from employees on safety compliance and performance issues. Approximately two-thirds of air carriers conducting operations under part 121 have implemented some type of ASAP program. While ASAP originally was limited to pilots and flight engineers, some air carriers have expanded the program to include their flight attendants, dispatchers, and mechanics; and one air carrier has an ASAP for ground service personnel.

To further ensure that the SMS is scaled to fit the needs of the air carrier's operations, the FAA recommends each air carrier evaluate its existing management systems and regulatory compliance programs and then incorporate those systems and programs that exemplify the key components of SMS as appropriate. The FAA designed the final rule to allow for this flexibility. The FAA acknowledges that many air carriers already have quality management systems (QMS) and other processes currently in place to monitor performance of their operations. In addition, some current regulatory and voluntary programs, like the continuing analysis and surveillance system (CASS) and ASAPs, can be incorporated into the SMS and used to meet the safety assurance requirements of the final rule. Incorporating those existing systems that already meet the performance objectives of this rule will only serve to expedite an air carrier's implementation of SMS, and allow for a smoother transition for employees expected to participate in the air carrier's SMS because of their familiarity with their employers' existing systems.

In addition to the flexibility incorporated in the final rule and the ability to leverage existing processes to meet SMS requirements, the FAA has offered a tool to air carriers that will facilitate SMS implementation and data management. It is important to note that this rule does not specifically require automated information technology systems. However, several SMS processes will require management of varying amounts of data, depending on the size and complexity of the air carrier's organization. Currently, air carriers have free access to the FAA's web-based application tool (WBAT) to assist in satisfying the data collection and management aspects of the final rule. WBAT is a federally developed and funded software system that may be used to assist the air carriers with data management.

WBAT began as an ASAP and incident reporting tool. Its use was expanded to contain functions that more broadly support SMS. Specifically, WBAT currently has modules that support the data management needs of safety risk management and safety assurance functions (e.g., employee reporting, audits, investigations, and evaluations). WBAT also contains an SMS implementation plan manager module, which supports the air carrier's implementation of SMS by providing a tool to guide air carriers through a gap analysis and implementation planning process. The results of the gap analysis and implementation planning are also documented and stored in WBAT. While WBAT data are treated as proprietary to the air carrier, permission can be given to the FAA to access it and review draft plans online and provide feedback, greatly expediting the review and approval process. WBAT is currently used by approximately 64 air carriers authorized to conduct operations under part 121. Of those 64 carriers, 55 use WBAT to support their SMS implementation as part of their participation in the Pilot Project.

While the FAA is not requiring air carriers to use WBAT, it is one option that is available and it reduces the costs of developing and implementing a separate platform. The FAA has made a commitment to continue to support WBAT for basic services as a result of the comments submitted to the NPRM.

#### *B. Scope and Definition of Hazard*

ATA, AIA/GAMA, and Delta asserted that the rule was too broad and could be applied to areas beyond the FAA's oversight authority. To address this issue, the commenters suggested revising the final rule to limit the SMS to those areas of a certificate holder's business that have a direct operational impact on aviation activities.

To address the commenters' concerns regarding the FAA's oversight of SMS, the FAA has incorporated the suggestions of the commenters to limit that oversight to the air carrier's aviation activities conducted under part 121. While some air carriers may narrowly tailor their SMS to address only these activities, the FAA acknowledges that some air carriers may opt to extend their SMS to other aviation related activities for which they hold certificates, such as 14 CFR part 145 (part 145) repair station activities, or 14 CFR part 142 training center activities. Some air carriers might also extend their SMS to their non-aviation related activities, such as security and occupational safety and health issues. If an air carrier elects to do so, the FAA would only conduct

oversight of the SMS activities related to its aviation operations that the air carrier conducts in accordance with the provisions of part 121. In the final rule, the FAA has revised the regulatory text to limit the application of SMS only to the aviation-related activities conducted under the air carrier's 14 CFR part 119 (part 119) certificate.

The FAA also limited the scope of SMS, in part, by defining hazard more narrowly. There were thirteen comments related to the definition of "hazard." U.S.C. stated that the definition of hazard should be expansive enough to include non-operational elements (*e.g.*, human resources, finance, information technology) of an organization. Twelve commenters (including SBA, ATA, AIA/GAMA, GE, and MARPA) suggested limiting the term "hazard" to the aviation operational environment. Specifically, these commenters were concerned about the scope and depth of expectations regarding hazard identification. They stated that the SMS should focus solely on conditions affecting the safety of aviation operations and not occupational safety or environmental protection, as could be inferred in the definition proposed in the NPRM. Other commenters asked whether certificate holders would be expected to track every conceivable hazard, even those instances in which exposure to the hazard is remote or the likelihood and/or severity of potential outcomes would be negligible.

Upon review of the comments, the FAA recognizes that the scope of the hazard and risk analysis and control processes required of the SMS must be consistent with the FAA's statutory authority and the intended scope of the SMS. Therefore, the FAA has amended the definition of "hazard" to limit it to a "condition that could foreseeably cause or contribute to an aircraft accident as defined in 49 CFR 830.2." This definition more clearly limits the potential events to be considered to those directly related to aircraft operations and the potential severity of those events to aircraft accidents, which is consistent with the FAA's statutory authority in 49 U.S.C. 44702. The FAA definition, though it is tailored specifically to aviation, is consistent in intent and application with long standing industry system safety definition and practice. The revised definition also incorporates the NTSB's definition of "aircraft accident," as provided under 49 CFR 830.2. According to 49 CFR 830.2, an "aircraft accident" means an occurrence associated with the operation of an aircraft which takes place between the

time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or in which the aircraft receives substantial damage.

#### *C. Protection of Information/Data From Disclosure Under Freedom of Information Act (FOIA)*

AMOA, AOPA, ASA, ATA, Boeing, Bombardier, CAA, EAA, FedEx, GE, HAI, JetBlue, MARPA, NACA, UTC, and RAA all raised concerns that if SMS data is not protected from disclosure under FOIA, the FAA's oversight over SMS could be compromised due to a lack of data being submitted to the FAA. ATA and GE, while supporting the FAA's approach in the NPRM to not require the physical submission of any data, asserted that this is not adequate protection. These commenters indicated that protection of this data is vital to ensuring this information is shared with the FAA.

Exposing submitted safety data to public scrutiny may have a chilling effect on reporting practice. ATA acknowledged that this information should be shared only with the FAA. JetBlue suggested the FAA develop a 14 CFR part 193 (part 193) protection order, extending the same protections to SMS data that currently exist for ASAP, the Flight Operational Quality Assurance Program (FOQA), the Line Operations Safety Audit (LOSA), etc. AAJ opposed the protection of information beyond existing FOIA protections because of the impact the protection may have on the ability to gather information during discovery processes.

The FAA recognizes that protection of certain safety information is vital to ensuring that employees and air carriers provide sufficient data to the FAA to ensure effective oversight over SMS. Section 44735 of title 49 of the United States Code, as amended by the FAA Modernization and Reform Act of 2012, Public Law 112-95 (Feb. 14, 2012), specifically contemplates the protection of voluntarily submitted reports, data, or other information produced or collected for purposes of developing and implementing a safety management system acceptable to the Administrator. It is important to note, however, such protection could not be afforded to information that is required to be kept to satisfy compliance with other regulatory requirements, such as crewmember training records or maintenance service records.

To further clarify the extent of protection that may be afforded under the statute, the FAA notes that any

record or other documentation that is required to show compliance with other regulatory requirements would not be protected. Protection also would not extend to records that must be made available under the provisions of 14 CFR 119.59. Furthermore, any information protected under the statute is only protected from release by the FAA. If the information is submitted or released by the air carrier to another government entity, the protections of the statute are not binding on these other entities. Nor are these documents necessarily protected from discovery in civil litigation, although the carrier would be free to ask the court for whatever protections would be appropriate under the rules of the relevant jurisdiction.

#### *D. Enforcement*

ACSF, AEA, and DTI Training raised concerns about the manner in which the FAA plans to enforce the requirements of the new rule and address issues of noncompliance identified through SMS policies and procedures. ACSF recommended that the FAA publish its plan for compliance and enforcement, and provide industry the opportunity to comment.

In regard to enforcement of the provisions of 14 CFR part 5 (part 5), the FAA acknowledges that each SMS will be uniquely designed to meet the needs of that air carrier's operations. Determining compliance with the requirements of part 5 will be dependent on the specific facts of each case. As such, the FAA will exercise its discretion in deciding to pursue enforcement of the requirements of part 5.

The FAA also recognizes that a fundamental concept of SMS is for air carriers to identify and correct their own instances of noncompliance and invest resources and efforts to preclude their recurrence. This concept is not new to FAA enforcement policy. Many air carriers are currently addressing these issues under the voluntary disclosure reporting program (VDRP). When an apparent violation is detected through SMS processes and procedures, the FAA encourages air carriers to use VDRP as appropriate to disclose the violation.

#### *E. Scope of SMS and Compliance With Administrative Procedure Act*

AOPA, ASA, MARPA, NATA, SBA, and True-Lock raised concerns that the FAA could use SMS to extend regulatory requirements without going through notice and comment rulemaking as required under the Administrative Procedure Act (APA), 5 U.S.C. 552. Specifically, concerns were

raised with regard to the requirement under the rule that the certificate holder develop risk controls for those hazards that require mitigation as identified under the certificate holder's safety risk management analysis.

This issue is not unique to SMS. Many regulations impose performance requirements that may be met in different ways. For example, certificate holders are required under 14 CFR 121.135 to develop and document certain procedures, methods, and instructions to personnel. This provision sets forth areas that must be addressed by these procedures, but does not prescribe the exact procedures that must be incorporated into the certificate holders' manuals. This discretion is evident in the requirement of 14 CFR 121.135(b)(15), which requires the manual to include "procedures for operating in periods of . . . potentially hazardous meteorological conditions." As the regulation does not establish a prescriptive, exclusive list of hazardous meteorological conditions for which procedures must be developed, the certificate holder must identify those conditions that are likely to impact its operation and address them appropriately in its manual. If these procedures are incorporated in the certificate holder's required manual, the certificate holder must ensure compliance with the procedures it develops and documents in its manuals.

A practical outcome of the safety risk management and safety assurance components of SMS is that procedures developed and documented under 14 CFR 121.135 may need to be revised, or new procedures added, to mitigate risk from identified hazards. It is not the intent of this rulemaking to alter the existing regulatory standards or the approval and acceptance processes that already apply to each certificate holder.

In some instances, the FAA may determine that a particular mitigation is necessary for all certificate holders based on the identification of a system-wide hazard. If the FAA identifies the need for such mitigation, the FAA would conduct rulemaking in accordance with the APA in order to apply the standard to all certificate holders.

#### F. Duplicative Rulemaking

ACSF, EAA, and NATA raised concerns about the different set of SMS requirements for airports and suggested combining these two rulemaking actions into one to ensure consistency. ASA and MARPA asserted that the FAA should not create a general part 5, but rather should incorporate the proposed requirements into a new subpart for part

121. This would allow for SMS requirements to be tailored to each specific part to address technical issues that are unique to the regulated entities.

As stated in the NPRM, the FAA developed the framework of the rule as a means of harmonizing with ICAO standards, while establishing a uniform standard that could be extended to apply to 14 CFR part 135 (part 135) certificate holders, part 145 repair stations, and design and manufacturing entities. The uniform standard is necessary because some of these regulated entities may hold more than one FAA certificate and may need or want to create one SMS to encompass all of their aviation-related activities. The general standards set forth in part 5 would permit such integration with only minor modifications. Any extension of the applicability of part 5 required by the FAA will be made through the APA notice and comment rulemaking process.

In regard to the separate standards for airports, the FAA notes that both SMS rules are structured in accordance with the ICAO SMS framework, which is identical in Annex 6 (air operators) and Annex 14 (airports). However, the FAA recognizes that there are inherent differences in the operation of an airport and an air carrier. Based on a review of these differences, the FAA determined that the rulemakings should proceed as separate projects.

Although there may be two separate regulations addressing SMS, the FAA encourages air carriers and airports to communicate with one another when hazards are identified through their respective SMS procedures and processes. In that way, they can determine which SMS may best address the hazard. For example, if an air carrier's employee identifies a hazard on the movement area of the airport, the air carrier's employee would likely report the hazard through the air carrier's employee reporting system. Once reported, the FAA recommends that the air carrier notify the airport of the identified hazard so the airport is aware of the issue and can analyze the risk accordingly. In addition, the air carrier may also analyze the risk of the hazard and determine if it warrants any sort of mitigation through the revision or further development of the air carrier's procedures. This type of communication will serve to ensure that hazards, whether unique to the certificate holder or more systemic to the airport, are being addressed effectively by all parties.

#### G. Credit for Pilot Project Participants and Adoption of Third Party/Accredited SMS

ATA, Delta, NACA, and StandardAero suggested grandfathering in the participants in the Pilot Project, or otherwise providing credit for their progress in developing and implementing an SMS based on the framework set forth in AC 120-92A. Delta requested additional guidance for those certificate holders transitioning from the levels of validation in the Pilot Project to satisfying the requirements of part 5. In addition, ASA and StandardAero requested that they receive credit for third party systems that are similar to SMS that they have implemented, such as QMS, IEP, or International Standard for Business Aircraft Operations (IS-BAO).

The FAA developed the requirements in the NPRM based on the ICAO SMS framework in Annex 6 and the guidelines for developing a voluntary SMS described in AC 120-92A, Appendix I. Despite the attempt to harmonize the proposed regulatory standards with the ICAO framework and guidance material, there may be some differences between what the air carriers have done in the Pilot Project and what would be required under part 5 once the rule becomes effective. Rather than exempt the Pilot Project participants from the requirements of part 5, the FAA believes that these air carriers would benefit from reviewing their existing implementation plans, and comparing the plans with the final rule. If gaps are found, the carriers would update the implementation plans to fill the gaps identified and submit their plans to the FAA for approval to satisfy the requirements of 14 CFR 5.1(b).

Some air carriers completed SMS implementation through the Pilot Project under the framework of AC 120-92A and their SMS has been validated by the FAA. To comply with the implementation plan requirements of 14 CFR 5.1(b), these air carriers will need to conduct a gap analysis of the systems currently in place under their SMS and the requirements of the final rule, and identify any gaps that will need to be addressed to bring their existing SMS into compliance with the requirements of the final rule. However, they may not have to repeat the entire gap analysis and planning process in areas where there are no differences between the final rule and Pilot Project guidance.

In regard to the request for credit for implementation of third party systems, like International Air Transportation Association (IATA) Operational Safety Audit (IOSA), International Standards

Organization (ISO)–9000/AS–9100, these systems have not been subject to review and acceptance by the FAA. It would be inappropriate to provide credit or waive compliance requirements to these air carriers who have implemented these third party systems. These systems may include some elements of an SMS, but may not contain all the necessary elements.

These third-party systems may be incorporated into an air carrier's SMS if the systems satisfy the requirements set forth in the final rule. If an air carrier plans to incorporate these other systems into its SMS, the air carrier should outline the incorporation of these systems in its implementation plan. Given these avenues for incorporating existing processes and procedures, the FAA has not revised the final rule to allow credit for Pilot Project participants, nor other air carriers who have implemented third-party SMS systems or other management tools.

#### *H. Applicability, Subpart A—Implementation Plans*

ACSF, ATA, Bombardier, NACA, and RAA requested the timeframe for submission of the implementation plans be extended from 6 months to anywhere from 9 to 18 months. ASCA, ATA, Bombardier, FedEx, Omni Air, and RAA expressed concern with the FAA's ability to manage the 90 submissions it will receive, as well as the FAA's ability to establish a consistent process for review and acceptance of the plans. Bombardier, EAA, and RAA asserted that an extension of this time is needed because the FAA would not be held to a timetable for accepting the implementation plans. FedEx suggested the FAA consider a timetable of three months to approve the implementation plan, or, in the alternative, to simply accept the plan. ASCA, Bombardier, and FedEx requested that the time to submit and wait for the FAA to approve an implementation plan should not be included in the 3-year implementation timeframe.

In addition, ATA, AOPA, ASCA, and Bombardier indicated that three years was not adequate for carriers to develop and implement an SMS. In contrast, AFA, ALPA, NTSB, Omni Air, and SWA acknowledged that the proposed timeframes for implementation plan approval and SMS acceptance were reasonable.

The FAA notes that 24 of the part 121 certificate holders participating in the SMS Pilot Project have submitted an SMS implementation plan as part of the pilot project. The typical implementation plans received in the pilot projects indicated that full

implementation of SMS could be achieved within three years. None of the participants indicated the need for more time during development of their plans. Because this timeframe is consistent with the comments received from AFA, ALPA, NTSB, Omni Air, and SWA, as well as the lessons learned from other Civil Aviation Authorities (CAAs), the FAA has determined that three years is an adequate timeframe for implementation of SMS.

However, upon review of the comments, the FAA has revised 14 CFR 5.3 to require submission of the implementation plan for review within 6 months of the final rule's effective date, and for approval of the plan no later than 12 months after the effective date of the final rule. As of January 11, 2012, 72 of the approximately 90 part 121 certificate holders are participating in the Pilot Project. Of these, 17 have completed implementation plans, which have been validated by the FAA. The average time for completing and receiving approval of these plans is approximately one year. Based on this average, the FAA expects that certificate holders will be able to meet this requirement. Certificate holders that already have a validated implementation plan through the Pilot Project will not be required to resubmit their original implementation plan for approval, but rather may submit an abridged analysis that identifies the areas in their existing implementation plans that need to be revised to comply with the new regulatory requirements. Many Certificate Management Teams (CMTs), which are the FAA field offices responsible for managing individual part 121 certificates, have been exposed to these implementation plans due to their work with the Pilot Project and, therefore, there should be no extended delays in reviewing and ultimately approving these plans. Accordingly, the FAA believes this timeframe is sufficient and will not cause undue burden on either the affected certificate holders or the FAA.

Pinnacle disagreed with the proposal to require implementation plans be approved. Due to the dynamic nature of the airline industry, Pinnacle asserts that these plans must be routinely modified to accommodate changes to an airline's organization or environment. If a plan requires approval, an airline would not be able to proceed with a change to a plan until the FAA reviewed and approved each change. Bombardier, while not objecting to the requirement to have the plans approved, recommended some minimum requirements for the content and level of detail for the implementation plan.

The FAA recognizes the dynamic nature of an air carrier's operations, and, thus, maintains that the SMS should be accepted rather than approved to allow the air carrier to make the necessary changes to address issues in its operations. However, to ensure that the SMS is properly developed within the required timeframe, some measure of additional oversight control is necessary. One of the foremost acknowledged sources of hazards is change in an air carrier's operation, and it is one of the principal reasons for special or expanded oversight by the FAA. The FAA, therefore, has not revised the requirement that the implementation plan must ultimately be approved. Any changes to the implementation plan and SMS will be documented and submitted to the FAA by the air carrier. If a modification is required, the FAA will provide additional guidance to the air carrier to ensure that the SMS remains in compliance with part 5 and is implemented within 3 years of the effective date of the final rule.

ATA suggested extending the effective date of the final rule because the proposed 60-day period is not sufficient time to review the rule and understand what is required to be in the implementation plan before the time for submission of the implementation plan begins to run. In contrast, AFA, NTSB, Omni Air, and SWA stated that the 60-day effective date was reasonable.

The FAA has determined that the 60-day effective date is appropriate. The changes to the final regulatory text are not significant and, again, more than 50% of the part 121 certificate holders already are engaged in developing and implementing an SMS. Therefore, the 60-day effective date is a reasonable timeframe for certificate holders to conduct their review of the final rule and initiate compliance.

#### *I. Subpart B, Safety Policy—Designation of a Single Accountable Executive and Sufficient Safety Management Personnel*

##### *a. Single Accountable Executive*

Bombardier raised concerns that proposed 14 CFR 5.25 does not permit any flexibility for the certificate holder to delegate tasks to more than one executive or other management representatives as appropriate, based on the size and complexity of the organization. ATA recommended further clarifying the role of the accountable executive, and removing the requirement that the accountable executive be responsible for implementation of the SMS. ATA, NACA, and RAA asserted that this

responsibility is better suited for the safety management representative. ALPA supported the designation of a single, accountable executive. Cessna and Futron recommended that the authority to make operational decisions and the authority to allocate resources should be better defined for the accountable executive, or otherwise removed from this paragraph. Futron asserted that the accountable executive should be outside of the normal safety chain and directly involved in the operational chain.

As proposed, 14 CFR 5.25 defines both the accountable executive and the management personnel. The accountable executive must be a single, identifiable person having final authority and responsibility for the safety performance of the air carrier. This ensures that executive management is integrally involved in the oversight of the air carrier's safety performance. The FAA has not revised this requirement in the final rule.

To address the commenters' concerns about the accountable executive's responsibilities, the FAA has clarified the criteria and responsibilities set forth in 14 CFR 5.25. As prescribed, the accountable executive needs to be able to organize, direct, and control the air carrier's activities, as well as allocate resources to make safety controls effective. The accountable executive must also develop the documented safety policy proposed under 14 CFR 5.21, communicate the policy throughout the air carrier, and regularly review the safety policy and safety performance of the air carrier. The accountable executive must review safety information to assess the overall performance of the air carrier and make necessary changes.

#### b. Management Representative

Delta suggested that the involvement of a part 119 management position in the efficient working of an SMS must suffice as a required resource for the implementation of the SMS. Other commenters questioned the need to require only one management representative and suggested revising the rule to allow for the certificate holder to determine how to structure a management team responsible for monitoring the daily operation of the SMS.

Part 119 identifies various management personnel needed for an air carrier to function and maintain a certificate. The FAA does not believe it is necessary to restrict part 121 air carriers from using only the Director of Safety or another part 119 management personnel position to perform the duties

specified in 14 CFR 5.25(c). The requirement to have a designated management representative was intended to ensure coordinated and consistent implementation of a fully integrated SMS throughout the air carrier's aviation related activities, as well as to provide adequate support for continued operation and maintenance of the SMS.

Upon review of the comments, it appears that either one person, or a combination of personnel, could perform the function of the management representative as proposed in the NPRM. The FAA does not expect that the accountable executive will always perform every day-to-day activity that the function of the management representative requires. As air carrier operations are diverse, one method of managing implementation and continued operation of an SMS cannot be exclusively defined. To do so may stifle innovation and creativity.

Although a single management representative, designated by and reporting directly to the accountable executive, is conceptually the most direct means of establishing a point of responsibility for an integrated system, this does not represent the only means. Depending upon the size and complexity of the air carrier, the functions of the management representative or personnel may range between being a collateral duty of the accountable executive, to a team of representatives working under the guidance and coordination of a team leader who is responsible for the effectiveness of the team. Accordingly, the FAA has revised 14 CFR 5.25(c) to allow the air carrier to designate sufficient management personnel responsible for the coordination and implementation of the SMS.

Whatever structure is implemented by the air carrier, 14 CFR 5.25(c)(4) requires that these personnel regularly report to the accountable executive. Personnel designated to perform this function must be in positions in the organization of sufficient independence to have direct access to the accountable executive to report on the safety performance of the operation and recommend any necessary improvements.

#### c. Role of Line Employees

AFA raised concerns that the line employees are not defined as having a key role in the decision-making process and that they are merely a reporting mechanism for the SMS. AFA asserted that these employees should also have input into the decision-making process.

For an SMS to be effective, input and active participation is essential from all levels of employees in an air carrier. Many air carriers have different decision-making processes, some of which include line employees. Roles that employees play within that air carrier's SMS must be identified and documented in the safety policy as described in 14 CFR 5.21. If line employees are identified to participate in safety boards, working groups or audit review teams, they must be trained to actively support the safety policy of the accountable executive as well as comply with all established organizational safety initiatives. Another aspect of SMS that requires line employee participation is the employee reporting system. The participation of line employees is critical in developing improvements in functions that directly impact their job tasks.

#### J. Subpart C, Safety Risk Management (SRM)

AIG, ASA, ATA, Boeing, GAMA, MARPA, Pinnacle, and RAA recognized the importance of SRM, but requested clarification regarding when the SRM processes and procedures are triggered and what constitutes a "system." The commenters also suggested reorganizing 14 CFR 5.51, 5.53, and 5.55, to emphasize hazard identification and to eliminate system analysis.

The FAA has revised the regulatory text to clarify how safety analyses must be used under safety risk management. With regards to this rule, the term "system" is used to describe the operational components used to deliver aviation-related services. Systems may include hardware, software, people, procedures, resources, or functions directly related to the delivery of air transportation services. For example, a system would include, among others: The aircraft, the crewmembers, crew training, crewmember duty time tracking programs, dispatch functions, maintenance of the aircraft, fueling, servicing, and flight operations. The term "system" does not include those people, procedures, resources, hardware, and software that are not directly related to the delivery of air transportation services (e.g., advertising, building maintenance, payroll). The FAA's use of the term "system," in this rulemaking, is consistent with long-standing use of the term within the industry.

As part of the SRM process, air carriers need to consider the operational environment directly related to the delivery of air transportation services. The operational environment that should be considered includes not only

the physical environment (e.g., terrain, weather, geographic location) but also any constraints on the air carrier's actions due to business needs and other laws or regulations that may affect the air carrier's air transportation services.

Regarding when SRM would be triggered, 14 CFR 5.51 (Applicability.) requires that the SRM process be applied under the following conditions: Planning for and implementation of new systems; revision of existing systems; development of operational procedures; or identification of hazards or ineffective risk controls through the safety assurance processes in subpart D of part 5. Some examples of these triggers are outlined below.

Changes to an air carrier's operation could include addition of new routes, opening or closing of line stations, adding or changing contractual arrangements for services, additions of new fleets or major modifications of existing fleets, addition of different types of operations such as extended-range operational performance standards operations, or a change in the software for operational systems such as flight planning and dispatch. Any of these additions or changes would trigger the use of the SRM process.

A further trigger for SRM would be cases when the safety assurance processes reveal hazards that have not been addressed or instances when the procedures that have been specified fail to control risk. For example, an air carrier might discover through employee reporting or internal auditing that procedures for loading data into the airplane flight management computer are confusing. This would result in action such as the air carrier modifying the procedures themselves or the training and checking process in use. In another example, an analysis of internal audits could reveal that a maintenance tracking and control program failed to identify required inspections, resulting in some of them being missed or overdue. In this case, the air carrier may decide that the program itself is defective and must be reengineered, again, requiring the application of SRM. These are just some examples of systems and triggers for the SRM processes of subpart C of the final rule.

RAA suggested that 14 CFR 5.53(c) include the requirement to track hazards. This practice would prevent hazards from being identified and recorded without further action. The FAA has reviewed this suggestion and determined that the purpose of the suggested revision is already met under the final rule. Subpart C, SRM, and Subpart D, Safety Assurance, work together such that identified hazards

must be tracked in addition to being identified. Thus, the FAA has not adopted this suggested revision in the final rule.

#### *K. Subpart D, Safety Assurance*

AIG, ASA, ATA, Boeing, Cessna, GAMA, MARPA, Rockwell Collins, and U.S.C. agreed on the importance of safety assurance practices, but recommended the FAA clarify the applicability of safety assurance and the definition of "system" to mirror the definition of "system" for SRM. Boeing also suggested revising 14 CFR 5.71 and 5.73 to limit the scope of the SMS to the aviation-related activities of the company. In addition, Boeing, GAMA, MARPA, and Rockwell Collins recommended replacing the term "operation" with "system" because operation implies the activities of an air carrier, and would require modification if these provisions were extended to other types of operators in future rulemakings.

AIA/GAMA, Boeing, Cessna, and Rockwell Collins all questioned using the terms "continuous" and "periodic" in 14 CFR 5.71. The commenters asserted that the terms are ambiguous and do not establish a frequency for adequate monitoring. For example, one commenter stated that the continuous monitoring requirement could imply monitoring the system 24 hours a day, which could be burdensome.

Because different systems will require different monitoring processes, the FAA has removed the terms continuous and periodic from 14 CFR 5.71. Additional clarification of the monitoring requirements is also provided in the advisory material associated with this final rule. In regards to the suggestion to define the term system for safety assurance, the FAA has determined that such a definition would not be necessary in the regulatory text because the list in 14 CFR 5.71(a) provides the scope of safety assurance activities. Further, as stated in section J, the term "system" is used to describe the operational components used to deliver aviation-related services. Systems may include hardware, software, people, procedures, resources, and functions directly related to the delivery of air transportation services. The systems addressed by this rule do not include those elements that are not directly related to the delivery of air transportation services.

#### *L. Subpart F, Recordkeeping and Documentation Requirements*

AIA/GAMA, Boeing, Bombardier, Omni Air, and Rockwell Collins asserted that the record keeping and

documentation requirements for SMS are too prescriptive and onerous. ATA and Delta advocated the retention requirement be scalable and flexible according to the certificate holder's policy and that outputs of the SMS should be retained for as long as deemed necessary by the air carrier. EAA questioned the operational reason for mandating the retention of SMS records beyond existing industry standards and requirements. NATA requested clarification on the types of documents that must be maintained under the proposed standards.

Bombardier and Boeing suggested revising recordkeeping provisions in 14 CFR 5.97 to require certificate holders to maintain these records for 5 years. AIA/GAMA also supported a 5-year retention requirement for outputs of SRM processes. NACA acknowledged that the recordkeeping requirements were acceptable as proposed.

Neither the proposed rule text nor the preamble implies that an air carrier would have to undergo a complicated and expensive revamping of its organization to accommodate document and record retention requirements. The required records can be kept electronically or in paper format. For SRM outputs, the timeline associated with the retention of the documents must be scalable to the air carrier's operation. The outputs of SRM processes should be kept for as long as they remain relevant to the air carrier's operation to allow the air carrier to evaluate whether the controls put in place under SRM are effective and needed. Once the action that triggers the development of the control is no longer present in the air carrier's operation, the air carrier may determine that the records no longer need to be kept. Thus, it is important that the air carrier exercise discretion to determine how long SRM output records are kept.

Similarly, this rule requires a certificate holder to retain records of SMS-required training that is administered to the accountable executive, members of the certificate holder's management, and other employees for as long as the individual who received the training is employed by the certificate holder. Once the individual who received the training is no longer employed by the certificate holder, there is no longer a need for the certificate holder to retain these records.

The recordkeeping requirements associated with the safety assurance's processes and procedures serve a different purpose. The goal of safety assurance is to collect historical data on an operating system for analysis. The air carrier needs to have sufficient

historical data to review. The 5-year period proposed in the NPRM is reasonable and will provide the air carrier with adequate records to conduct analysis. The FAA has determined that the proposed recordkeeping retention requirements are appropriate and has retained the requirements in the final rule.

#### M. Flow-Down of Requirements

ALPA asserted that an air carrier must exercise some oversight of those entities providing services to them and that the proposed rule would naturally have some flow down effect. ALPA asserted there should be a requirement to develop and document an avenue for the reporting of hazards from subcontractor field employees to the air carrier. This may include establishing a liaison that would communicate necessary safety information to the subcontractor and take corrective action as necessary.

RAA stated that, even though the FAA will not expand these existing requirements to entities other than certificate holders authorized to conduct operations under part 121, it can be expected that air carrier SMS programs will produce positive trickledown benefits to the operational safety of contractors. Under this scenario, air carriers will provide safety-enhancing guidance and oversight (at some level) to relevant elements of their contract service providers operations, and contractors will share information with the air carriers on the risks or safety trends that the contractors may from time to time identify.

Bombardier stated that it is expected that SMS regulated entities will determine what aspects of the SMS need to be passed on to non-regulated suppliers and pass those requirements along through business requirements. Inevitably, this will then result in additional burden on the regulated entities to provide support and increased oversight to ensure compliance of these suppliers, contractors and sub-contractors with these SMS related requirements. The SMS rule should be carefully constructed to allow those part 121 or 135 carriers to accept their part 145 certificated suppliers' SMS without deviation. Otherwise, inconsistent requirements will be passed on from different operators.

ASA and MARPA stated it is normal in the industry for air carriers and other certificate holders to flow-down their requirements to their suppliers, even without a regulatory requirement. For example, many certificate holders may decide to use their suppliers as data

sources for their SMS (e.g., reports of identified hazards). There is nothing in the regulation that prevents the FAA from stating that once the flow-down is in the manual, the supplier becomes part of the SMS system and thus becomes subject to SMS oversight. They recommended that the rule specify that a company may rely on its business partners as data sources for its SMS, but even if it does so, this act alone would not impose SMS regulations (or FAA SMS oversight) on the business partner.

NACA agreed, asserting that it is not necessary to require contractors or subcontractors to develop an SMS at this time. They should be permitted to let data flow into a part 121 carrier's program when handling their aircraft. This would add valuable information to SMS and produce a more comprehensive program.

AOPA strongly disagreed with the FAA's assessment and believed the FAA has greatly underestimated the trickle down implications for contractors and subcontractors of regulated certificate holders. The more functions a certificate holder contracts out, such as fueling, deicing, and pilot training, the more critical it is that the certificate holder include its contractors in its SMS process. Although the FAA is not seeking regulation of these contracted entities, AOPA asserted that FAA should not discount the potential effects of this proposed regulation on these entities. AOPA is concerned that this ripple effect would become even more apparent when the FAA expands the requirements of 14 CFR part 5 to encompass part 135 certificate holders.

Delta Air Lines did not see a significant impact or flow down effect of the development of SMS and its implications on vendors and contractors providing services to the operator. The comprehensive implementation in all levels of the organization has allowed the vendors and contractors to be assessed under the safety assurance component of its SMS and findings and observations are mitigated under a risk-based system documented and tracked according to the SMS requirements and SRM techniques.

Boeing said that the product/service provider should be allowed to determine the level of integration based on business needs and operational efficiency, without incurring undue compliance burden.

The SMS requirements of the rule are intended to be applied to individual air carriers. This rule does not require the air carrier to require SMSs on the part of contractors, code-share partners, or other business affiliates. This rule permits the use of contractors as a data

source, but will not mandate this requirement. Associated policy and advisory documents will not specify or imply these requirements as conditions of acceptance. An air carrier may include SMS in its negotiated business arrangements, consistent with the common practice in industry where air carriers require registration under such programs as AS 9100, IOSA, and Coordinating Agency for Supplier Evaluation (C.A.S.E.) audits. Contractual requirements for arrangements do not relieve the air carrier from its responsibilities under this rule.

#### N. FAA Capability To Manage Oversight

AIA/GAMA, AOPA, Hawker Beechcraft, JetBlue, Omni Air, and RAA asserted it is essential that the FAA develop and deploy appropriate training and guidance material for the inspector workforce involved in SMS assessment and oversight. Hawker Beechcraft and Omni Air questioned whether the FAA would be able to handle the significant surge in plan submissions as the deadline nears.

FedEx suggested that the FAA consider a process by which differences in interpretation, applicability, and direction between a carrier and the FAA approval authority can be elevated within the FAA for resolution.

Clear and comprehensive guidance documents have been developed and will be provided to the Aviation Safety Inspectors (ASIs) prior to this rule's effective date to ensure standardization. The SMS Program Office is also available as subject matter experts to assist the field office inspectors. Training is also currently underway for part 121 ASIs. This training includes the principles and precepts of SMS. Additional training is being designed to enhance the ASI's knowledge and ability to assess the compliance of an air carrier's SMS with part 5.

Air carriers also will be able to use the Consistency and Standardization Initiative<sup>6</sup> to appeal decisions related to the review of their SMS. The FAA will consider a process by which differences in interpretation, applicability, and direction between an air carrier and the FAA approval authority can be elevated to the applicable FAA office for resolution.

#### O. Guidance Material

ACSF, AOPA, Boeing, GE, Hawker Beechcraft, and NATA suggested rescinding draft FAA Order 8900xx and reissuing simplified guidance material

<sup>6</sup> For more information regarding the Consistency and Standardization Initiative please refer to: [http://www.faa.gov/about/office\\_org/headquarters\\_offices/avs/consistency\\_standardization/](http://www.faa.gov/about/office_org/headquarters_offices/avs/consistency_standardization/).

because the draft order is too prescriptive. The commenters were concerned that the guidance material and orders significantly expands the regulatory requirements in proposed part 5. Commenters noted that the draft order contained material that was too academic and should be revised for clarity.

Upon review of the comments, the FAA has revised the guidance material to ensure that there is a clear delineation between regulatory requirements and other information.<sup>7</sup> The FAA has also revised the draft guidance for inspectors to provide instruction on various methods that may be employed to satisfy the requirements of this rule.

#### *P. Determination of Acceptable Levels of Safety*

AEA, AOPA, ASCA, and ATA asked for a definition of acceptable level of safety. They expressed concern that lacking a clear definition of this term would leave the industry and the FAA in a position where inspectors would be defining what constitutes an acceptable level of safety. This would lead to inconsistent application across the industry. The SBA also asserted that the FAA should conduct a gap analysis of its regulations and fill any holes to establish standardized acceptable levels of safety through the regulations that can be uniformly applied throughout the industry.

The term “acceptable level of safety” is only used in the preamble of the NPRM and is only mentioned when referencing ICAO standards/framework and an NTSB recommendation. In determining the safety performance measurement for the air carrier’s operation, each air carrier should use the regulatory minimums set forth in Chapter I, Title I, of 14 CFR as the baseline.

#### *Q. Performance Based v. Process Based Regulation*

ASA and MARPA stated that the proposed part 5 was a process-based rule. In contrast, AIA/GAMA and Bombardier stated that the proposal was a performance-based rule. All of these commenters expressed a strong desire to avoid a prescriptive-based rule because of the dynamic nature of air carrier operations. They were also concerned that a performance-based rule could lead to wide variances in interpretation as to what is acceptable for an SMS.

The ARC, ATA, and GE expressed a strong desire for a rule that closely

matched the ICAO framework to allow for increased acceptance of an air carrier’s SMS by foreign civil aviation authorities. They stressed the need to balance prescription with the need for adequate description and flexibility to develop multiple solutions in the interest of increased innovation. They stated that the proposed requirements met all of these needs.

Changing the regulatory text to a pure performance-based rule would deviate from the ICAO SMS requirements. This increases the risk that the FAA’s SMS rules would fail to meet the requirements of other sovereign nations, and thus jeopardize the ability of U.S. air carriers to operate in countries where compliance with these standards is enforced. This final rule specifies a basic set of processes to form a framework for the SMS, but does not specify particular methods for implementing these processes. This provides a balance between standardization and a robust SMS structure while allowing considerable flexibility for how an individual air carrier chooses to establish its SMS.

#### *R. Employee Reporting Systems*

Proposed 14 CFR 5.21(a)(4) states there must be an employee reporting system, and that the reporting system must be confidential as per 14 CFR 5.71(a)(7). AFA, ALPA, RAA, and SWA were concerned that unless an explicit restriction is imposed to prevent abuse, disclosures of safety improvement opportunities, concerns, or issues submitted by any employee may be used against the reporting employee in a disciplinary manner. They suggested that the employee reporting system be non-punitive.

The confidential reporting system in 14 CFR 5.71(a)(7) is a conduit for employees to raise safety issues without fear of reprisal. There is a distinction in a non-punitive reporting system and the requirement in 14 CFR 5.21(a)(5) to require the certificate holder to establish a policy that defines unacceptable employee behaviors. There are some instances where disciplinary action is warranted (*e.g.*, the behavior indicates a willful disregard to comply with company procedures or regulations) and 14 CFR part 5 recognizes this fact. Therefore, the rule requires a certificate holder to establish a confidential employee reporting system and define unacceptable behaviors. This allows the confidential gathering of safety information from employees while maintaining the certificate holder’s freedom to address unacceptable behavior.

## **V. Regulatory Notices and Analyses**

### *A. Regulatory Evaluation*

Changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 and Executive Order 13563 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 (Pub. L. 96–354) requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Trade Agreements Act (Pub. L. 96–39) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the United States. In developing U.S. standards, this Trade Act requires agencies to consider international standards and, where appropriate, that they be the basis of U.S. standards. Fourth, the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) requires agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of \$100 million or more annually (adjusted for inflation with base year of 1995). This portion of the preamble summarizes the FAA’s analysis of the economic impacts of this final rule. We suggest readers seeking greater detail read the full regulatory evaluation, a copy of which we have placed in the docket for this rulemaking.

In conducting these analyses, FAA has determined that this final rule: (1) Has benefits that justify its costs, (2) is not an economically “significant regulatory action” as defined in section 3(f) of Executive Order 12866, (3) is “significant” as defined in DOT’s Regulatory Policies and Procedures; (4) will not have a significant economic impact on a substantial number of small entities; (5) will not create unnecessary obstacles to the foreign commerce of the United States; and (6) will not impose an unfunded mandate on state, local, or tribal governments, or on the private sector by exceeding the threshold identified above. These analyses are summarized below.

#### *i. Total Benefits and Costs of This Rule*

This rule requires Part 121 operators (domestic, flag, and supplemental operations) to establish an SMS. It is expected that the requirements of the rule will help airlines to identify safety problems, and if airlines take steps to mitigate these problems it is estimated

<sup>7</sup> The FAA acknowledges that Advisory Circular 120–92 is not binding.



that the benefits from that mitigation could be between \$205.0 and \$472.3 million over 10 years (\$104.9 to \$241.9 million present value at 7 percent

discount rate). Costs of the rule's provisions (excluding any mitigation costs, which have not been estimated) are estimated to be \$224.3 million

(\$135.1 million present value at 7 percent discount rate) over 10 years.

ESTIMATED COSTS AND BENEFITS FOR ALL PART 121 CARRIERS—2014–2023

[Millions of 2010 Dollars \* (Discounted at 7% Discount Rate)]

Costs .....	Rule Implementation Costs: \$135.1.
	Mitigation Costs: Not quantified, estimates not included.
Benefits from Provisions of the Rule and any Consequent Safety Mitigation Actions **	\$104.9–\$241.9.

\* Table values have been rounded. Totals may not add due to rounding.

\*\* Given the range of mitigation actions possible, it is difficult to quantify potential benefits. This range reflects the potential benefits resulting from examples of possible mitigation actions.

ii. Who is potentially affected by this rule?

All Part 121 Operators

iii. Assumptions

- All costs and benefits are presented in 2010 dollars.
- All costs and benefits are estimated over a 10-year period from 2014 through 2023.
- Benefits of SMS implementation would begin to accrue in 2017.
- Costs to air carriers would begin to accrue in 2014.
- The present value discount rate is 7 percent.
- The Value of Statistical Life = \$8.9 million in 2010\$.

iv. Benefits of This Rule

The benefits of this final rule consist of the value of averted fatalities, casualties, aircraft damage, accident investigation costs, and reduced employee compensation claims. These benefits are a result of identifying safety issues, spotting trends, implementing necessary safety mitigations, and communicating findings before they result in a near-miss, incident, or accident. Over the 10-year period of analysis, it is estimated that the benefits from averted accidents, reduced employee compensation claims, and safety mitigations could range between \$205.0 and \$472.3 million (\$104.9 to \$241.9 million present value at 7 percent discount rate).

v. Costs of This Rule

Each air carrier will be required to develop an SMS that includes the four SMS components: Safety Policy, Safety Risk Management, Safety Assurance, and Safety Promotion. To support each component, the FAA projects that the compliance cost of this rule will come from the initial development and documentation of the carriers' SMS, implementation and continuous operating costs to include the

modification or purchasing of new equipment/software, additional staff and promotional materials, and training. Costs increase with the size of the carrier and the type of operations that they provide. However, medium and large operators have existing quality management systems which will lower their estimated compliance costs. Costs of the rule's provisions (excluding any mitigation costs, which have not been estimated) are estimated to be \$224.3 million (\$135.1 million present value at 7 percent discount rate) over 10 years.

B. Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (Pub. L. 96–354) (RFA) establishes “as a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure that such proposals are given serious consideration.” The RFA covers a wide-range of small entities, including small businesses, not-for-profit organizations, and small governmental jurisdictions.

Agencies must perform a review to determine whether a rule will have a significant economic impact on a substantial number of small entities. If the agency determines that it will, the agency must prepare a regulatory flexibility analysis as described in the RFA. Section 603 of the Act requires agencies to prepare and make available for public comment an initial regulatory flexibility analysis (IRFA) describing the impact of proposed rules on small entities.

As required by Section 603(a) of the RFA, we prepared and published an initial regulatory flexibility analysis

(IRFA) as part of the NPRM for this rule (75 FR 68240, November 5, 2010). As a result of that analysis we determined this rule would have a significant impact on a substantial number of small entities for the following reasons: We estimated that 64 operators were small entities. Even though the proposed rule responds to the PL 111–216 Congressional requirement, we structured the requirement such that small entities could meet the requirements with lower costs than a larger firm.

Section 604 of the RFA also requires an agency to publish a final regulatory flexibility analysis (FRFA) in the **Federal Register** when issuing a final rule. Section 604(a) requires that each FRFA contain:

- A statement of the need for, and objectives of, the rule;
- a statement of the significant issues raised by the public comments in response to the initial regulatory flexibility analysis, a statement of the assessment of the agency of such issues, and a statement of any changes made in the proposed rule as a result of such comments;
- the response of the agency to any comments filed by the Chief Counsel for Advocacy of the Small Business Administration in response to the proposed rule, and a detailed statement of any change made to the proposed rule in the final rule as a result of the comments;
- a description of and an estimate of the number of small entities to which the rule will apply or an explanation of why no such estimate is available;
- a description of the projected reporting, recordkeeping and other compliance requirements of the rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for preparation of the report or record; and,

- a description of the steps the agency has taken to minimize the significant economic impact on small entities consistent with the stated objectives of applicable statutes, including a statement of the factual, policy, and legal reasons for selecting the alternative adopted in the final rule and why each one of the other significant alternatives to the rule considered by the agency which affect the impact on small entities was rejected.

#### A Statement of the Need for, and Objectives of, the Rule

The objective of Safety Management Systems (SMS) is to proactively manage safety, to identify potential hazards, to determine risk, and to implement measures that mitigate the risk. The FAA envisions operators being able to use all of the components of SMS to enhance a carrier's ability to identify safety issues and spot trends before they result in a near-miss, incident, or accident. For this reason, the FAA is requiring carriers to develop and implement an SMS.

#### A Statement of the Significant Issues Raised by the Public Comments in Response to the Initial Regulatory Flexibility Analysis, a Statement of the Assessment of the Agency of Such Issues, and a Statement of any Changes Made in the Proposed Rule as a Result of Such Comments

AEA commented that the FAA failed to analyze alternatives and stated that small carriers do not have enough incidents to make SMS cost-beneficial. The FAA maintains that SMS is congressionally mandated and we did look at two alternatives. For the final rule we discussed: (1) Extending the timeframe for development of SMS implementation plans; and (2) extending the timeframe for implementation of SMS. However, as stated above, the FAA ultimately determined that delaying the implementation of SMS delays the safety benefits and this delay in benefits is not offset by the small, delayed compliance cost. Upon a review of these costs, the FAA determined the compliance costs are not a significant economic impact.

#### The Response of the Agency to any Comments Filed by the Chief Counsel for Advocacy of the Small Business Administration in Response to the Proposed Rule, and a Detailed Statement of any Change Made to the Proposed Rule in the Final Rule as a Result of the Comments

The Small Business Administration (SBA) commented that an SMS would

be burdensome for a small carrier, plus SMS may be more suitable for larger carriers because it aids in reducing silos which many not be an issue because of size for many smaller carriers. The FAA maintains the program is flexible and there are several existing programs that small carriers can leverage to make SMS less expensive. For example, many small and medium sized carriers reported that they would use the Web-Based Application Tool (WBAT), which is an FAA sponsored tool, to report and house their data. In addition, carriers that are currently pursuing an SMS reported benefits similar to their larger counterparts.

#### A Description of and an Estimate of the Number of Small Entities To Which the Rule Will Apply or an Explanation of why no Such Estimate is Available

Under the North American Industry Classification System (NAICS) codes 481111 and 481112, for scheduled air transportation, small entities would be all part 121 carriers with less than 1,500 employees. The FAA estimates that there are approximately 90 part 121 operators and 60 of these operators meet the definition of a small entity; therefore the FAA believes that there are a substantial number of small entities impacted by this rule.

#### A Description of the Projected Reporting, Recordkeeping and Other Compliance Requirements of the Rule, Including an Estimate of the Classes of Small Entities Which Will be Subject to the Requirement and the Type of Professional Skills Necessary for Preparation of the Report or Record

An SMS is a formalized approach to managing safety by developing an organization-wide safety policy, developing formal methods of identifying hazards, analyzing and mitigating risk, developing methods for ensuring continuous safety improvement, and creating organization-wide safety promotion strategies. Each air carrier would be required to develop an SMS that includes the four SMS components: Safety Policy, Safety Risk Management, Safety Assurance, and Safety Promotion. To support each component, the FAA projects that the compliance cost of this rule would come from the initial development and documentation of their SMS, implementation and continuous operating costs to include the modification or purchasing of new equipment/software, additional staff and promotional materials, and training. Costs increase as the size of the carrier increases. However, carriers have the ability to use existing programs such as

an Aviation Safety Action Programs (ASAP) or the Web-Based Application Tool (WBAT) to meet these requirements.

The FAA estimated the average annual compliance cost during the first three years the rule is in effect for the 60 carriers identified as small entities and compared these costs to calendar year 2011 operating revenues (the most current data available).<sup>8</sup> The compliance cost for small entities was then averaged for three groups based on carrier fleet size (small, medium, and large). Carriers with a fleet of 9 or less aircraft are in the "small" group; carriers with between 10 and 47 aircraft are in the "medium" group; and carriers with a fleet size greater than 47 aircraft are in the "large" group.

Each of the 29 carriers in the "small" group fits the criteria of a small entity. The compliance cost for this group of carriers will average \$164,500 per year. For the 26 small entities in the "medium" group, the compliance cost will average \$206,400 per year. The compliance cost for the five carriers identified as small entities in the "large" group will average \$408,000 per year. Each carrier's compliance cost will vary from the averages presented here due to carrier size (in terms of employee headcount), and the extent to which a carrier already has an ASAP or other safety program already in place.

Of the 60 carriers classified as small entities, 54 reported operating revenues on Form 41. For these 54 reporting carriers, annual compliance costs during the first three years the rule is in effect were less than two percent of their calendar year 2011 operating revenues. A determination for the six remaining small entities was not possible because financial data was not publicly available.

#### A Description of the Steps the Agency Has Taken To Minimize the Significant Economic Impact on Small Entities Consistent With the Stated Objectives of Applicable Statutes, Including a Statement of the Factual, Policy, and Legal Reasons for Selecting the Alternative Adopted in the Final Rule and Why Each One of the Other Significant Alternatives to the Rule Considered by the Agency Which Affect the Impact on Small Entities Was Rejected

To relieve the burden of this rule on small entities, the FAA considered extending the timeframe for

<sup>8</sup> U.S. Department of Transportation Form 41 (Schedule P1.1, and P1.2), and Form 298-C (Schedule F1). For carriers not reporting a full year of CY 2011 operating revenues, the most recent four consecutive quarters of data was used.

development of SMS implementation plans. In making this determination, the FAA considered longer and shorter terms. However, it settled on one year based on information from the SMS Pilot Project, which showed that an average of one year was sufficient to develop and approve an implementation plan.<sup>9</sup> As part of its analysis, the FAA noted that pilot project participants ultimately had differing levels of SMS implementation. However, because all pilot project participants had initially developed (and received FAA validation on) an implementation plan that provided for full SMS implementation, the FAA was able to use this data to estimate how long it would take a certificate holder to develop such a plan and get the plan approved by the FAA.

The FAA also considered extending the timeframe for implementation of SMS. However, the FAA ultimately concluded that three years for full implementation of SMS is appropriate. In making this determination, the FAA considered longer and shorter terms. Based on information from the SMS Pilot Project, as well as lessons learned from other Civil Aviation Authorities (CAAs), which showed that three years was an appropriate timeframe for implementation of an SMS, the FAA decided that three years was the best interval to allow carriers to prepare and begin implementation.<sup>10</sup> With regard to both of these alternatives, the timelines chosen for implementation plans and final implementation of SMS are mitigated for small entities to the extent that SMS plans and programs must be appropriate to the size, scope, and complexity of the certificate holder's operations, and are therefore scalable to the size of the small entity.

In conclusion, while the FAA found this rule will affect a substantial number of small entities, we found annual compliance cost was less than two percent of annual revenue for the firms with public data. As the compliance cost is less than two percent of annual revenue, the FAA concludes there will

not be a significant economic impact. Therefore, as the FAA Administrator, I certify this rule will not have a significant economic impact on a substantial number of small entities.

#### *D. International Trade Impact Assessment*

The Trade Agreements Act of 1979 (Pub. L. 96–39), as amended by the Uruguay Round Agreements Act (Pub. L. 103–465), prohibits Federal agencies from establishing standards or engaging in related activities that create unnecessary obstacles to the foreign commerce of the United States. Pursuant to these Acts, the establishment of standards is not considered an unnecessary obstacle to the foreign commerce of the United States, so long as the standard has a legitimate domestic objective, such the protection of safety, and does not operate in a manner that excludes imports that meet this objective. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards. The FAA has assessed the potential effect of this final rule and determined that it uses ICAO international standards as its basis and therefore is in compliance with the Trade Agreements Act.

#### *E. Unfunded Mandates Assessment*

Title II of the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) requires each Federal agency to prepare a written statement assessing the effects of any Federal mandate in a proposed or final agency rule that may result in an expenditure of \$100 million or more (in 1995 dollars) in any one year by State, local, and tribal governments, in the aggregate, or by the private sector; such a mandate is deemed to be a “significant regulatory action.” The FAA currently uses an inflation-adjusted value of \$143.1 million in lieu of \$100 million. This final rule does not contain such a mandate; therefore, the requirements of Title II of the Act do not apply.

#### *F. Paperwork Reduction Act*

The Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) requires that the FAA consider the impact of paperwork and other information collection burdens imposed on the public. According to the 1995 amendments to the Paperwork Reduction Act (5 CFR 1320.8(b)(2)(vi)), an agency may not collect or sponsor the collection of information, nor may it impose an information collection requirement unless it displays a currently valid Office of Management and Budget (OMB) control number.

This final rule will impose new information collection requirements. The estimated burden of those requirements is discussed below. As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), the FAA has submitted these information collection requirements to OMB for its review. Notice of OMB approval for this information collection will be published in a future **Federal Register** document.

Under this final rule, each certificate holder operating under part 121 will develop an SMS, tailored to its unique operating environment, comprised of the four key components: Safety policy, safety risk management, safety assurance, and safety promotion. Collection and analysis of safety data is an essential part each carrier's SMS. The FAA has identified the following areas that will create information collection burdens under this final rule: Development and implementation of the SMS; implementation plan and documentation; recordkeeping requirements associated with the safety policy, safety risk management and safety assurance processes; training records, and communication records. In addition, based on comments received to the proposed rule, the FAA has also identified information collection burdens associated with expanding existing programs that may be used to satisfy the requirements of the final rule. For all information required to be submitted, documented, or collected under this final rule, the FAA does not specify how, or in what media, the documents and records must be maintained relative to the requirements of the final rule. Air carriers are encouraged to use existing mechanisms and systems to minimize the burden of the final rule. These burdens are outlined below. The cost estimates associated with these burdens are based on comments from the ARC, information from the SMS pilot program participants, and comments received in response to the NPRM.

##### *i. Expansion of Existing Programs*

The FAA has strongly encouraged air carriers to use existing programs, such as the Aviation Safety Action Program (ASAP), and the Internal Evaluation Program (IEP), to satisfy some of the requirements for the safety assurance component of SMS. The FAA expects that the 59 air carriers with existing ASAP programs will expand their programs to cover those employees currently not covered, to satisfy the employee reporting system requirement of the final rule. For the 31 remaining air carriers, the FAA expects that these carriers will use the employee reporting

<sup>9</sup> MITRE Corporation conducted a study of the pilot project participants and concluded that it took, on average, approximately one year for pilot project participants to complete implementation plans.

<sup>10</sup> While many pilot project participants are not small carriers, the large and mid-size carriers that make up a large portion of the pilot project participants had to build an SMS from the ground up. The typical implementation plan received from these carriers showed that they would be able to fully implement an SMS within three years. Because SMS is scalable, a small carrier's SMS will be less complex than a large or mid-size carrier's SMS. Accordingly, the FAA does not expect small carriers to need more time to implement an SMS than the large and mid-size carriers that were part of the pilot project.

tools in the Web-Based Application Tool (WBAT), which is a federally developed and funded software system that can be used, for example, to develop an implementation plan,

document hazards, and create an employee reporting system. Because this is a federally funded system, the FAA estimated a minimal burden for those 31 carriers using WBAT. The information

collection costs for air carriers expanding existing programs to comply with this rule are as follows.

a. Estimate Annual Cost of Expanding Existing Programs

59 .....	Part 121 Carriers with an ASAP for one or more employee groups <sup>11</sup>
1 .....	Full Time Employee (FTE) = 2000 hours per year
2 .....	FTEs per additional ASAP @ 0.2 FTE each <sup>12</sup> = 800 hours per ASAP
3 .....	Pilot ASAPs
14 .....	Mechanic and Engineering (M&E) ASAPs
18 .....	Dispatcher ASAPs
+ 32 .....	Flight Attendant (FA) ASAPs
<hr/>	
67 .....	Total Employee Group ASAPs
\$2,000 .....	Hardware/software, administration, and meeting logistics per group <sup>13</sup>
× 67 .....	Total Employee Group ASAPs
<hr/>	
\$134,000 .....	Material Cost per Year

Employee group	Annual salary	Hourly salary
Airline pilots/copilots/flight engineers salary: <sup>14</sup> .....	\$151,248	\$75.6239
Maintenance staff salary: <sup>15</sup> .....	73,606	36.8031
Dispatchers salary: <sup>16</sup> .....	70,250	35.1249
Flight attendants salary: <sup>17</sup> .....	54,290	27.1452

3 Pilot ASAPs * 800 hours: .....	2,400 hours.
14 M&E ASAPs * 800 hours: .....	11,200 hours.
18 Dispatcher ASAPs * 800 hours: .....	14,400 hours.
+ 32 FA ASAPs * 800 hours: .....	25,600 hours.
<hr/>	
Total Labor Hours per Year .....	53,600 hours.

	Hours * labor rate	In 000's
3 Pilot ASAPs .....	2,400 hr * \$75.6239 .....	\$181.497
14 M&E ASAPs .....	11,200 hr * 36.8031 .....	412.195
18 Dispatcher ASAPs .....	14,400 hr * 35.1249 .....	505.798
+ 32 FA ASAPs .....	25,600 hr * 27.1452 .....	694.917
<hr/>		
Total Labor Cost per Year .....		1,794.408
+ Total Material Cost per Year .....		134.000
<hr/>		
Total Cost per Year for Expanding Existing Programs .....		1,928.408

b. Estimated Implementation Cost of Expanding of Existing Programs

The FAA assumes that the 59 carriers expand these programs over 3 years. A third of the expansion will be completed in year one, two-thirds of the

program will be completed in year two, and the program will be fully operational by the third year.

Year 1 .....	53,600 hours * 33.3% .....	17,848.8
Year 2 .....	53,600 hours * 66.6% .....	35,697.6
+ Year 3 .....	53,600 hours * 100.0% .....	53,600.0
<hr/>		
Total Labor Hours for 3 Years ...		107,146.4

		In 000's
Year 1 .....	\$1,928.408 * 33.3% .....	\$ 642.160
Year 2 .....	\$1,928.408 * 66.6% .....	1,284.320

<sup>11</sup> <http://www.faa.gov/about/initiatives/asap> (August 23, 2011).

<sup>12</sup> ATA response to NPRM "Request for Comments" (Docket No. FAA-2009-061), Figure 3, page 35.

<sup>13</sup> Ibid.

<sup>14</sup> [http://www.bls.gov/oes/current/naics3\\_481000.htm](http://www.bls.gov/oes/current/naics3_481000.htm), <http://www.bls.gov/news.release/pdf/ecec.pdf>, BLS reports in Table A. Relative importance of employer costs for employee compensation, June 2011 that additional employer

compensation per employee is roughly 31% of an employee's salary

<sup>15</sup> Ibid.

<sup>16</sup> Ibid.

<sup>17</sup> Ibid.

		In 000's
+ Year 3 .....	\$1,928.408 * 100.0% .....	1,928.408
Total Cost for 3 Years .....	.....	3,854.888

c. Estimated Total Costs of Expanding Existing Programs

Implementation Cost: 107,146.4 labor hours and \$3.9 million over 3 years.

Average Annual Cost: 35,715.5 labor hours and \$1.28 million per year.

ii. Implementation Plan, SMS Documentation and Implementation

All 90 certificate holders will be required to develop and submit an implementation plan. The implementation plan will guide the certificate holder's implementation of SMS, as well as provide the basis for FAA's oversight during the

development and implementation phases. The SMS implementation plan is the only document or data that the certificate holder must submit to the FAA. It is a one-time submission due six months after the effective date of the final rule.

All 90 certificate holders must also develop and maintain documentation that describes the safety policy for the certificate holder. The safety policy must address, among other things, the certificate holder's safety objectives, statements about the necessary resources for the implementation of the SMS, a safety reporting policy that defines requirements for employee

reporting of safety hazards or issues, and an emergency response plan.

In addition to the safety policy, all 90 certificate holders are required under this rule to develop and maintain documentation of SMS processes and procedures, including safety risk management processes and safety assurance processes. Given that these processes and procedures will depend on the size and scope of each air carrier's operation, the amount of documentation will vary greatly amongst these certificate holders.

a. Estimated Cost of Implementation Plan and SMS Documentation

One Full Time Employee (FTE): .....	2,000 hours/yr
Research Analyst Salary: <sup>18</sup> .....	\$92,958/yr or \$46.479/hr
Material Documentation Cost (3 years): <sup>19</sup> .....	Small \$24,000
	Medium 95,000
	Large 337,500

	Hours
30 Large Carriers * 4,256 hrs/yr of labor per carrier: .....	127,680
31 Medium Carriers * 2,732 hrs/yr of labor per carrier: .....	84,692
+ 29 Small Carriers * 3,045 hrs/yr of labor per carrier: .....	88,305
Total Labor Hours per Year for 90 Carriers .....	300,677
Total Labor Hours for 90 Carriers over 3 Years .....	902,031
<hr/>	
Total Labor Hours per Year .....	300,677
× Research Analyst Hourly Wage .....	\$46.479
Total Labor Cost/Per Year for 90 Carriers .....	\$13,975,166
Total Initial Labor Cost for 90 Carriers over 3 Years .....	41,925,498
<hr/>	
30 Large Carriers * \$337,500 material cost over three years: .....	\$10,125,000
31 Medium Carriers * \$95,000 material cost over three years: .....	2,945,000
29 Small Carriers * \$24,000 material cost over three years: .....	696,000
90 Carriers Initial Material Cost Over 3 Years .....	13,766,000
<hr/>	
Initial Labor Cost for 90 Carriers over 3 Years .....	41,925,498
× Initial Material Cost for 90 Carriers over 3 Years .....	13,766,000
Initial Cost Burden Over Years 1–3 .....	55,691,498

b. Estimated Annual Cost of SMS Documentation

In comments to the NPRM, ATA estimates that small carriers will spend \$10,000 a year, medium sized carriers

will spend \$15,000, and large carriers will spend \$30,000 on SMS manual revision.

30 Large Carriers * \$30,000/yr per carrier .....	\$ 900,000
31 Medium Carriers * \$15,000/yr per carrier .....	465,000

<sup>18</sup> Bureau of Labor Statistics, <http://www.bls.gov/oes/current/oes152031.htm>.

<sup>19</sup> Initial Regulatory Evaluation Voluntary Program Participant's Survey.

+ 29 Small Carriers * \$10,000/yr per carrier .....	290,000
Document Update Costs per Year for Years 4–10 .....	\$1,655,000

iii. SMS Recordkeeping Requirements

This rule requires air carriers to record outputs from their safety risk management (SRM) processes, safety assurance (SA) processes, safety communications and SMS training. Records of outputs for SRM processes must be maintained for as long as the outputs remain relevant to the certificate holder's operation. Outputs of safety assurance processes must be maintained for 5 years. Training records must be kept for as long as the individual is employed by the certificate holder and all SMS communication records under § 5.93 must be kept for 24 months. The scope and breadth of these

recordkeeping requirements will depend on the size and complexity of the certificate holder's operation. To mitigate these burdens, the FAA has not specified how, or in what media, these records must be maintained, and has also encouraged the use of existing mechanisms. For example, the FAA has estimated the burden of maintaining employee SMS training records to be minimal since 121 certificate holders are already required to maintain training records.

Based on this information, the FAA maintains that only one additional employee will be required for carriers with several existing safety programs, 2 full time employees for large and

medium carriers with few pre-existing programs, and a part-time employee for small carriers. The FAA also maintains that there will be minimal additional material costs and training record costs since all part 121 certificate holders already maintain training records. Operating costs will begin after the development, documentation, and implementation of an SMS.

a. Estimated Annual Cost of SMS Recordkeeping Requirements:

90 Operators  
 One Full Time Employee (FTE) = 2000 hours per year  
 Research Analyst Salary<sup>20</sup> = \$92,958 per year = \$46.479 per hour

	Hours
59 Large/Medium Carriers * 1 FTE * 2,000 hours .....	118,000
9 Large/Medium Carriers * 2 FTE * 2,000 hours .....	36,000
+ 22 Small Carriers * 0.5 FTE * 2,000 hours .....	22,000
<b>Total Recordkeeping Hours per Year for 90 carriers (Years 4–10) .....</b>	<b>176,000</b>
<b>Total Recordkeeping Hours per Year for 90 carriers .....</b>	<b>176,000</b>
× Hourly Wage—Research Analyst .....	\$46.479
<b>Total Recordkeeping Cost per Year for 90 Carriers (Years 4–10) .....</b>	<b>\$8,180,304</b>
Promotional material per year per carrier <sup>21</sup> .....	\$833
× 90 Carriers .....	90
<b>Total Promotional Material Cost per Year for 90 Carriers (Years 4–10) .....</b>	<b>\$74,970</b>
<b>Total Recordkeeping Cost per Year for 90 Carriers (Years 4–10) .....</b>	<b>\$8,180,304</b>
+ <b>Total Promo Material Cost per Year for 90 Carriers (Years 4–10) .....</b>	<b>\$74,970</b>
<b>Total Annual Cost (Years 4–10) .....</b>	<b>\$8,255,274</b>

b. Estimated Total Annual Cost of SMS Recordkeeping Requirements

176,000 labor hours and \$8.3 million per year (Years 4–10).

This rule requires air carriers to implement an SMS acceptable to the Administrator within 3 years of the effective date of the final rule. The FAA offers a federally developed and funded software system, WBAT, which serves a

variety of functions in addition to aiding carriers with their ASAPs and SMS. The FAA estimates at most that it costs \$2.6 million per year to maintain WBAT.

iv. Estimated Costs to the Federal Government

v. Summary of Total Burden

a. Implementation Cost

Years 1–3 .....	Develop, Implement, Document SMS-Initial Cost Burden .....	\$55,691,498
+ Years 1–3 .....	Cost to Expand Existing Programs .....	3,854,888
Years 1–3 .....	<b>Total Implementation Cost .....</b>	<b>59,546,386</b>

b. Annual Cost

+ Years 1–10 .....	Federal Govt Cost—WBAT .....	\$ 2,600,000
Years 4–10 .....	Staffing and Promotional Material .....	\$8,255,274

<sup>20</sup> Bureau of Labor Statistics, <http://www.bls.gov/oes/current/oes152031.htm>.

<sup>21</sup> Initial Regulatory Evaluation Voluntary Program Participant's Survey.

Years 4–10 .....	ASAPs .....	1,928,408
+ Years 4–10 .....	SMS Manual Updates .....	1,655,000
Years 4–10 .....	Total Cost Per Year .....	11,838,682
Years 1–10 .....	\$ 2,600,000 * 10 years .....	\$26,000,000
Years 4–10 .....	\$11,838,682 * 7 years .....	82,870,774

### G. International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to conform to International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. The FAA has reviewed the corresponding ICAO Standards and Recommended Practices and has identified the following differences with these proposed regulations. Amendment 30 to Annex 6 part I Section 3.2 Safety Management, Paragraph 3.3.6 effective 1 January, 2009 requires that a Flight Data Analysis Program be in the SMS standard. The FAA will file a difference with ICAO.

ICAO Annex 6 part I includes a provision that part 121 air carriers operating airplanes having a maximum gross takeoff weight in excess of 27,000 kg (approximately 59,400 lbs.). “. . . shall establish and maintain a flight data analysis programme as part of its safety management system.” Flight Data Analysis Program (FDAP) is a general term encompassing a number of means by which routine flight operations data may be acquired, recorded, analyzed, and shared. Flight Operational Quality Assurance (FOQA) is one such program. FOQA is a formal voluntary program which has been implemented by 41 air carriers conducting operations under part 121. FOQA specifications include installation of extensive flight data recording systems which facilitate rapid transfer of recorded data, de-identification of that data, and agreements between pilot organizations and the air carriers which define how this information may be used.

The part 121 fleet is diverse in terms of size, complexity, and age, as well as the size of the air carriers that operate them. Many of the older aircraft would require extensive modifications to adapt them to the technical requirements of a FOQA program. The investment and expense of implementing and maintaining such a system exceeds the financial capability of many smaller air carriers. There are a number of ways to meet the requirements of an FDAP. Therefore, the FAA will not require FOQA in this rule.

### H. Environmental Analysis

FAA Order 1050.1E identifies FAA actions that are categorically excluded

from preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act in the absence of extraordinary circumstances. The FAA has determined this rulemaking action qualifies for the categorical exclusion identified in Chapter 3, paragraph 312d and involves no extraordinary circumstances.

#### I. Regulations Affecting Intrastate Aviation in Alaska

Section 1205 of the FAA Reauthorization Act of 1996 (110 Stat. 3213) requires the FAA, when modifying its regulations in a manner affecting intrastate aviation in Alaska, to consider the extent to which Alaska is not served by transportation modes other than aviation, and to establish appropriate regulatory distinctions. In the NPRM, the FAA requested comments on whether the proposed rule should apply differently to intrastate operations in Alaska. The agency did not receive any comments, and has determined, based on the administrative record of this rulemaking, that there is no need to make any regulatory distinctions applicable to intrastate aviation in Alaska.

### VI. Executive Order Determinations

#### A. Executive Order 13132, Federalism

The FAA has analyzed this final rule under the principles and criteria of Executive Order 13132, Federalism. The agency determined that this action will not have a substantial direct effect on the States, or the relationship between the Federal Government and the States, or on the distribution of power and responsibilities among the various levels of government, and, therefore, does not have Federalism implications.

#### B. Executive Order 13211, Regulations That Significantly Affect Energy Supply, Distribution, or Use

The FAA analyzed this final rule under Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use (May 18, 2001). The agency has determined that it is not a “significant energy action” under the executive order and it is not likely to have a significant adverse effect on the supply, distribution, or use of energy.

### VII. How To Obtain Additional Information

#### A. Rulemaking Documents

An electronic copy of a rulemaking document may be obtained by using the Internet—

1. Search the Federal eRulemaking Portal (<http://www.regulations.gov>);
2. Visit the FAA’s Regulations and Policies Web page at [http://www.faa.gov/regulations\\_policies/](http://www.faa.gov/regulations_policies/) or
3. Access the Government Printing Office’s Web page at <http://www.gpo.gov/fdsys/browse/collection.action?collectionCode=FR>.

Copies may also be obtained by sending a request (identified by notice, amendment, or docket number of this rulemaking) to the Federal Aviation Administration, Office of Rulemaking, ARM–1, 800 Independence Avenue SW., Washington, DC 20591, or by calling (202) 267–9680.

#### B. Comments Submitted to the Docket

Comments received may be viewed by going to <http://www.regulations.gov> and following the online instructions to search the docket number for this action. Anyone is able to search the electronic form of all comments received into any of the FAA’s dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.).

#### C. Small Business Regulatory Enforcement Fairness Act

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 requires FAA to comply with small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. A small entity with questions regarding this document, may contact its local FAA official, or the person listed under the **FOR FURTHER INFORMATION CONTACT** heading at the beginning of the preamble. To find out more about SBREFA on the Internet, visit [http://www.faa.gov/regulations\\_policies/rulemaking/sbre\\_act/](http://www.faa.gov/regulations_policies/rulemaking/sbre_act/).

### List of Subjects

#### 14 CFR Part 5

Air carriers, Aircraft, Airmen, Aviation safety, Reporting and recordkeeping requirements, Safety, Transportation.

**14 CFR Part 119**

Administrative practice and procedure, Air carriers, Aircraft, Aviation safety, Charter flights, Reporting and recordkeeping requirements.

**The Amendment**

In consideration of the foregoing, and under the authority of 49 U.S.C. 106(f) and 44701(a)(5), the Federal Aviation amends chapter I of title 14, Code of Federal Regulations, as follows:

- 1. The heading for subchapter A is revised to read as follows:

**Subchapter A—Definitions and General Requirements**

- 2. Add part 5 to subchapter A to read as follows:

**PART 5—SAFETY MANAGEMENT SYSTEMS****Subpart A—General**

- Sec.
- 5.1 Applicability.
  - 5.3 General requirements.
  - 5.5 Definitions.

**Subpart B—Safety Policy**

- 5.21 Safety policy.
- 5.23 Safety accountability and authority.
- 5.25 Designation and responsibilities of required safety management personnel.
- 5.27 Coordination of emergency response planning.

**Subpart C—Safety Risk Management**

- 5.51 Applicability.
- 5.53 System analysis and hazard identification.
- 5.55 Safety risk assessment and control.

**Subpart D—Safety Assurance**

- 5.71 Safety performance monitoring and measurement.
- 5.73 Safety performance assessment.
- 5.75 Continuous improvement.

**Subpart E—Safety Promotion**

- 5.91 Competencies and training.
- 5.93 Safety communication.

**Subpart F—SMS Documentation and Recordkeeping**

- 5.95 SMS documentation.
- 5.97 SMS records.

**Authority:** Pub. L. 111–216, sec. 215 (Aug. 1, 2010); 49 U.S.C. 106(f), 106(g), 40101, 40113, 40119, 41706, 44101, 44701–44702, 44705, 44709–44711, 44713, 44716–44717, 44722, 46105.

**Subpart A—General****§ 5.1 Applicability.**

(a) A certificate holder under part 119 of this chapter authorized to conduct operations in accordance with the requirements of part 121 of this chapter must have a Safety Management System that meets the requirements of this part

and is acceptable to the Administrator by January 8, 2018.

(b) A certificate holder must submit an implementation plan to the FAA Administrator for review no later than September 9, 2015. The implementation plan must be approved no later than March 9, 2016.

(c) The implementation plan may include any of the certificate holder's existing programs, policies, or procedures that it intends to use to meet the requirements of this part, including components of an existing SMS.

**§ 5.3 General requirements.**

(a) Any certificate holder required to have a Safety Management System under this part must submit the Safety Management System to the Administrator for acceptance. The SMS must be appropriate to the size, scope, and complexity of the certificate holder's operation and include at least the following components:

- (1) Safety policy in accordance with the requirements of subpart B of this part;
- (2) Safety risk management in accordance with the requirements of subpart C of this part;
- (3) Safety assurance in accordance with the requirements of subpart D of this part; and
- (4) Safety promotion in accordance with the requirements of subpart E of this part.

(b) The Safety Management System must be maintained in accordance with the recordkeeping requirements in subpart F of this part.

(c) The Safety Management System must ensure compliance with the relevant regulatory standards in chapter I of Title 14 of the Code of Federal Regulations.

**§ 5.5 Definitions.**

*Hazard* means a condition that could foreseeably cause or contribute to an aircraft accident as defined in 49 CFR 830.2.

*Risk* means the composite of predicted severity and likelihood of the potential effect of a hazard.

*Risk control* means a means to reduce or eliminate the effects of hazards.

*Safety assurance* means processes within the SMS that function systematically to ensure the performance and effectiveness of safety risk controls and that the organization meets or exceeds its safety objectives through the collection, analysis, and assessment of information.

*Safety Management System (SMS)* means the formal, top-down, organization-wide approach to managing safety risk and assuring the

effectiveness of safety risk controls. It includes systematic procedures, practices, and policies for the management of safety risk.

*Safety objective* means a measurable goal or desirable outcome related to safety.

*Safety performance* means realized or actual safety accomplishment relative to the organization's safety objectives.

*Safety policy* means the certificate holder's documented commitment to safety, which defines its safety objectives and the accountabilities and responsibilities of its employees in regards to safety.

*Safety promotion* means a combination of training and communication of safety information to support the implementation and operation of an SMS in an organization.

*Safety Risk Management* means a process within the SMS composed of describing the system, identifying the hazards, and analyzing, assessing and controlling risk.

**Subpart B—Safety Policy****§ 5.21 Safety policy.**

(a) The certificate holder must have a safety policy that includes at least the following:

- (1) The safety objectives of the certificate holder.
- (2) A commitment of the certificate holder to fulfill the organization's safety objectives.
- (3) A clear statement about the provision of the necessary resources for the implementation of the SMS.
- (4) A safety reporting policy that defines requirements for employee reporting of safety hazards or issues.
- (5) A policy that defines unacceptable behavior and conditions for disciplinary action.

(6) An emergency response plan that provides for the safe transition from normal to emergency operations in accordance with the requirements of § 5.27.

(b) The safety policy must be signed by the accountable executive described in § 5.25.

(c) The safety policy must be documented and communicated throughout the certificate holder's organization.

(d) The safety policy must be regularly reviewed by the accountable executive to ensure it remains relevant and appropriate to the certificate holder.

**§ 5.23 Safety accountability and authority.**

(a) The certificate holder must define accountability for safety within the organization's safety policy for the following individuals:



(1) Accountable executive, as described in § 5.25.

(2) All members of management in regard to developing, implementing, and maintaining SMS processes within their area of responsibility, including, but not limited to:

(i) Hazard identification and safety risk assessment.

(ii) Assuring the effectiveness of safety risk controls.

(iii) Promoting safety as required in subpart E of this part.

(iv) Advising the accountable executive on the performance of the SMS and on any need for improvement.

(3) Employees relative to the certificate holder's safety performance.

(b) The certificate holder must identify the levels of management with the authority to make decisions regarding safety risk acceptance.

#### **§ 5.25 Designation and responsibilities of required safety management personnel.**

(a) *Designation of the accountable executive.* The certificate holder must identify an accountable executive who, irrespective of other functions, satisfies the following:

(1) Is the final authority over operations authorized to be conducted under the certificate holder's certificate(s).

(2) Controls the financial resources required for the operations to be conducted under the certificate holder's certificate(s).

(3) Controls the human resources required for the operations authorized to be conducted under the certificate holder's certificate(s).

(4) Retains ultimate responsibility for the safety performance of the operations conducted under the certificate holder's certificate.

(b) *Responsibilities of the accountable executive.* The accountable executive must accomplish the following:

(1) Ensure that the SMS is properly implemented and performing in all areas of the certificate holder's organization.

(2) Develop and sign the safety policy of the certificate holder.

(3) Communicate the safety policy throughout the certificate holder's organization.

(4) Regularly review the certificate holder's safety policy to ensure it remains relevant and appropriate to the certificate holder.

(5) Regularly review the safety performance of the certificate holder's organization and direct actions necessary to address substandard safety performance in accordance with § 5.75.

(c) *Designation of management personnel.* The accountable executive

must designate sufficient management personnel who, on behalf of the accountable executive, are responsible for the following:

(1) Coordinate implementation, maintenance, and integration of the SMS throughout the certificate holder's organization.

(2) Facilitate hazard identification and safety risk analysis.

(3) Monitor the effectiveness of safety risk controls.

(4) Ensure safety promotion throughout the certificate holder's organization as required in subpart E of this part.

(5) Regularly report to the accountable executive on the performance of the SMS and on any need for improvement.

#### **§ 5.27 Coordination of emergency response planning.**

Where emergency response procedures are necessary, the certificate holder must develop and the accountable executive must approve as part of the safety policy, an emergency response plan that addresses at least the following:

(a) Delegation of emergency authority throughout the certificate holder's organization;

(b) Assignment of employee responsibilities during the emergency; and

(c) Coordination of the certificate holder's emergency response plans with the emergency response plans of other organizations it must interface with during the provision of its services.

#### **Subpart C—Safety Risk Management**

##### **§ 5.51 Applicability.**

A certificate holder must apply safety risk management to the following:

(a) Implementation of new systems.

(b) Revision of existing systems.

(c) Development of operational procedures.

(d) Identification of hazards or ineffective risk controls through the safety assurance processes in subpart D of this part.

##### **§ 5.53 System analysis and hazard identification.**

(a) When applying safety risk management, the certificate holder must analyze the systems identified in § 5.51. Those system analyses must be used to identify hazards under paragraph (c) of this section, and in developing and implementing risk controls related to the system under § 5.55(c).

(b) In conducting the system analysis, the following information must be considered:

(1) Function and purpose of the system.

(2) The system's operating environment.

(3) An outline of the system's processes and procedures.

(4) The personnel, equipment, and facilities necessary for operation of the system.

(c) The certificate holder must develop and maintain processes to identify hazards within the context of the system analysis.

#### **§ 5.55 Safety risk assessment and control.**

(a) The certificate holder must develop and maintain processes to analyze safety risk associated with the hazards identified in § 5.53(c).

(b) The certificate holder must define a process for conducting risk assessment that allows for the determination of acceptable safety risk.

(c) The certificate holder must develop and maintain processes to develop safety risk controls that are necessary as a result of the safety risk assessment process under paragraph (b) of this section.

(d) The certificate holder must evaluate whether the risk will be acceptable with the proposed safety risk control applied, before the safety risk control is implemented.

#### **Subpart D—Safety Assurance**

##### **§ 5.71 Safety performance monitoring and measurement.**

(a) The certificate holder must develop and maintain processes and systems to acquire data with respect to its operations, products, and services to monitor the safety performance of the organization. These processes and systems must include, at a minimum, the following:

(1) Monitoring of operational processes.

(2) Monitoring of the operational environment to detect changes.

(3) Auditing of operational processes and systems.

(4) Evaluations of the SMS and operational processes and systems.

(5) Investigations of incidents and accidents.

(6) Investigations of reports regarding potential non-compliance with regulatory standards or other safety risk controls established by the certificate holder through the safety risk management process established in subpart B of this part.

(7) A confidential employee reporting system in which employees can report hazards, issues, concerns, occurrences, incidents, as well as propose solutions and safety improvements.

(b) The certificate holder must develop and maintain processes that

analyze the data acquired through the processes and systems identified under paragraph (a) of this section and any other relevant data with respect to its operations, products, and services.

**§ 5.73 Safety performance assessment.**

(a) The certificate holder must conduct assessments of its safety performance against its safety objectives, which include reviews by the accountable executive, to:

(1) Ensure compliance with the safety risk controls established by the certificate holder.

(2) Evaluate the performance of the SMS.

(3) Evaluate the effectiveness of the safety risk controls established under § 5.55(c) and identify any ineffective controls.

(4) Identify changes in the operational environment that may introduce new hazards.

(5) Identify new hazards.

(b) Upon completion of the assessment, if ineffective controls or new hazards are identified under paragraphs (a)(2) through (5) of this section, the certificate holder must use the safety risk management process described in subpart C of this part.

**§ 5.75 Continuous improvement.**

The certificate holder must establish and implement processes to correct safety performance deficiencies identified in the assessments conducted under § 5.73.

**Subpart E—Safety Promotion**

**§ 5.91 Competencies and training.**

The certificate holder must provide training to each individual identified in § 5.23 to ensure the individuals attain and maintain the competencies necessary to perform their duties

relevant to the operation and performance of the SMS.

**§ 5.93 Safety communication.**

The certificate holder must develop and maintain means for communicating safety information that, at a minimum:

(a) Ensures that employees are aware of the SMS policies, processes, and tools that are relevant to their responsibilities.

(b) Conveys hazard information relevant to the employee's responsibilities.

(c) Explains why safety actions have been taken.

(d) Explains why safety procedures are introduced or changed.

**Subpart F—SMS Documentation and Recordkeeping**

**§ 5.95 SMS documentation.**

The certificate holder must develop and maintain SMS documentation that describes the certificate holder's:

(a) Safety policy.

(b) SMS processes and procedures.

**§ 5.97 SMS records.**

(a) The certificate holder must maintain records of outputs of safety risk management processes as described in subpart C of this part. Such records must be retained for as long as the control remains relevant to the operation.

(b) The certificate holder must maintain records of outputs of safety assurance processes as described in subpart D of this part. Such records must be retained for a minimum of 5 years.

(c) The certificate holder must maintain a record of all training provided under § 5.91 for each individual. Such records must be retained for as long as the individual is employed by the certificate holder.

(d) The certificate holder must retain records of all communications provided under § 5.93 for a minimum of 24 consecutive calendar months.

**PART 119—CERTIFICATION: AIR CARRIERS AND COMMERCIAL OPERATORS**

■ 3. The authority citation for part 119 is revised to read as follows:

**Authority:** Pub. L. 111–216, sec. 215 (August 1, 2010); 49 U.S.C. 106(f), 106(g), 1153, 40101, 40102, 40103, 40113, 44105, 44106, 44111, 44701–44717, 44722, 44901, 44903, 44904, 44906, 44912, 44914, 44936, 44938, 46103, 46105.

■ 4. Add § 119.8 to read as follows:

**§ 119.8 Safety Management Systems.**

(a) Certificate holders authorized to conduct operations under part 121 of this chapter must have a safety management system that meets the requirements of part 5 of this chapter and is acceptable to the Administrator by March 9, 2018.

(b) A person applying to the Administrator for an air carrier certificate or operating certificate to conduct operations under part 121 of this chapter after March 9, 2015, must demonstrate, as part of the application process under § 119.35, that it has an SMS that meets the standards set forth in part 5 of this chapter and is acceptable to the Administrator.

Issued in Washington, DC, under the authority provided by 49 U.S.C. 106(f), 44701(a)(5) and Sec. 215 of Pub. L. 111–216, 124 Stat. 2350 (49 U.S.C. 44701 note) on January 5, 2015.

**Michael P. Huerta,**  
*Administrator.*

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