Safety Oversight and Certification Aviation Rulemaking Committee (SOC-ARC) Recommendation Report to the Federal Aviation Administration

December 31, 2018

Prepared for
Executive Director, Aircraft Certification Service &
Executive Director, Flight Standards Service
Federal Aviation Administration
Washington, DC

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Letter from the SOC-ARC Co-Chair

December 31, 2018

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Federal Aviation Administration
800 Independence Avenue, SW
Washington, D.C. 20591

Ms. Lirio Liu
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Federal Aviation Administration
800 Independence Avenue, SW
Washington, D.C. 20591

Subject: Submittal of the Safety Oversight and Certification Aviation Rulemaking Committee (SOC-ARC) Recommendation Report

Reference: SOC-ARC Charter, Effective 1/5/2018

Dear Ms. Liu and Mr. Carter:

On behalf of the industry and FAA members of the Safety Oversight and Certification Aviation Rulemaking Committee (SOC-ARC), I am pleased to submit the enclosed recommendation report which supports implementation of the Comprehensive Strategic Plan for AIR Transformation to meet future demands on FAA safety oversight and aircraft certification.

The SOC-ARC was comprised of members and subject matter experts representing all aspects of aircraft certification and system oversight processes, analysis and regulatory compliance. It included design, manufacture and repair industry; Federal Aviation Administration labor union bargaining units, Aircraft Certification Service, and Flight Standards Service. I want to thank the members for their contributions and dedication to completing the assigned tasking. The ARC recommendations represent a collaborative consensus effort.

The ARC provided comments to FAA on the draft Comprehensive Strategic Plan for AIR Transformation and established three working groups in the identified priority areas of compliance assurance, flight standards integration and performance measures and feedback loops. The ARC's overarching recommendations are based on the WG evaluation of the aircraft certification and safety oversight system and industry's current processes and detailed findings and recommendations.

We are confident the ARC recommendations, when implemented as part of the CSP for AIR Transformation, will result in a safer, more effective, and more efficient certification process for both the FAA and industry. Furthermore, the changes recommended have the potential to facilitate increased international cooperation and efficiencies, strengthening the FAA's global aviation safety leadership and supporting the competitiveness of U.S. products.

Please direct any comments or questions you may have to Michael Thacker of this office at 817-280-6298 or e-mail mthacker@bellflight.com

Michael Thacker
Executive Vice President of
Technology and Innovation, Bell
SOC-ARC Industry Co-Chair

Executive Summary

The Safety Oversight and Certification Aviation Rulemaking Committee (SOC-ARC) was established by the FAA Administrator in January 2018 to evaluate the aircraft certification and safety oversight system and industry's current processes and provide recommendations for implementation of the Comprehensive Strategic Plan for AIR Transformation to meet future demands on FAA safety oversight and aircraft certification.

This SOC-ARC recommendation report focuses on three priority areas of compliance assurance, flight standards integration and performance measures & feedback loops and some general areas.

Recommendations of the Safety Oversight and Certification Rulemaking Committee (SOC-ARC)

Recommendation 1 – FAA/Industry Collaboration: The SOC-ARC recommends that FAA continue constructive engagement with industry to develop and implement further changes and improvements to certification and system oversight processes through an appropriate collaboration mechanism such as an ARC.

Recommendation 2 - Compliance Assurance System: The SOC-ARC recommends a framework for FAA to recognize and oversee a design approval holder/applicant organization's Compliance Assurance System to make compliance determinations that the FAA can rely upon for issuance of a design approval with consideration of the elements, procedures and phased implementation approach outlined in the Compliance Assurance Working Group report (reference Appendix C of this report).

Recommendation 3 – Integrated Program Management: The SOC-ARC recommends establishment of an integrated program management framework with responsibility and accountability for type certification and operational evaluation project planning, coordination and performance among AIR, AFX and any other FAA policy and field office necessary for issuance of design approvals and entry into service with consideration of the elements outlined in the Flight Standards Integration Working Group report (reference Appendix D of this report).

Recommendation 4 – Bilateral Cooperation of Operational Evaluations: The SOC-ARC recommends the FAA work with bilateral partners to establish procedures which maximize reliance on each other's systems for operational evaluation of new aviation products and eliminates duplication through acceptance or streamlined validation based on confidence with consideration of the elements outlined in the Flight Standards Integration Working Group report (reference Appendix D of this report).

Recommendation 5 – Metrics & Measures: The SOC-ARC recommends simplifying the measures outlined in the CSP in both total number and complexity of data and prioritizing implementation of the most impactful measures near-term and consideration of the assessment and recommendations for each measure outlined in the Performance Measures and Feedback Loops Working Group report (reference Appendix E of this report).

Recommendation 6 – System oversight: The SOC-ARC recommends the FAA engage industry in a collaborative initiative to examine current practices and implementation plans related to project and applicant risk and performance assessments, how these will evolve to align with CSP Initiatives 1 & 2 and

the 2018 FAA reauthorization requirements. The recommendation will address how FAA and industry will periodically review that the respective oversight actions and systems are functioning as intended and identify further changes that may be necessary.

Recommendation 7 – Issues Resolution: The SOC-ARC recommends a structured issues resolution process for rapidly resolving technical disagreements, such as those related to regulatory interpretation, application and acceptable means of compliance.

Recommendation 8 – Regulatory Guidance Library: The SOC-ARC recommends documentation of FAA decisions (such as issues resolution, CSI, white papers, and other policy interpretations), with the reasons for the decisions, archival of such decisions, and a searchable database of such decisions to allow both industry and FAA personnel to examine past decisions and use them to more efficiently identify compliance modes for future projects.

Recommendation 9 – Change Management: The SOC-ARC recommends FAA continue to focus on change management when implementing new policies, processes and initiatives to ensure that local office activities and performance are consistent with objectives and they achieve the intended outcomes for applicants.

Recommendation 10 – Current Initiatives: The SOC-ARC endorses the following current certification improvement initiatives which support CSP initiatives and development of implementation plans and recommends that FAA implement changes necessary to achieve intended benefits and safety outcomes taking into consideration the SOC-ARC comments: ODA Scorecard & Metric Continuous Improvement Team (ODA-CIT), FAA & Industry Guide to Product Certification (Certification Process Guide – CPG), System Recognition (formerly referred to as Applicant Showing Only), Flight Standards Air Carrier Training ARC Flight Standards Board (FSB) WG and Flight Standards Letter of Authorization Process Improvement WG (LOAPI WG).

Recommendation 11 – Systems Approach for Conformity: The SOC-ARC recommends that FAA update policy to provide for acceptance of applicant/manufacturer system for conformity and/or configuration management that satisfies 14 CFR 21.33 and 21.53 requirements in lieu of redundant FAA conformity checks.

Recommendation 12 – Electronic Data: The SOC-ARC recommends that FAA prioritize implementation of e-data submittals and responses with a national initiative to drive implementation.

Recommendation 13 – TSO Deviations: The SOC-ARC recommends that previously approved TSO deviations be included in a searchable database of regulatory and guidance information and to allow ACOs to “locally approve” deviations for local projects based on the previous approvals.

Recommendation 14 – TSO Continued Operational Safety: The SOC-ARC recommends a policy revision and/or spot amendment to Sec 45.10 TSO marking to allow for continued production and delivery in accordance with an FAA-accepted corrective action plan for TSO design deficiency that does not result in an unsafe condition. This would be consistent with how similar deficiencies are addressed in TC/STC design approvals. This is the same recommendation made in the Part 21/SMS ARC report in Appendix I “TSO Sub-team Working Group Report” and should be prioritized for implementation as soon as practical.

1.0 About the SOC-ARC

The Federal Aviation Administration (FAA) chartered the Safety Oversight and Certification Aviation Rulemaking Committee (SOC-ARC) on January 5, 2018 for the U.S. aviation community in collaboration with the FAA to conduct an evaluation of the aircraft certification and safety oversight system and make recommendations for changes to current regulations, policy and guidance material (***Appendix A***). The FAA formed the ARC to ensure industry engagement and support as FAA implemented planned changes associated with the FAA Aircraft Certification Service (AIR) Transformation.

FAA AIR Transformation is the Aircraft Certification Service's comprehensive approach to becoming more efficient and effective. Two foundational elements to successfully achieve the outcomes desired in the AIR Transformation are effective change management and industry commitment. The SOC-ARC is intended to enable both foundational elements.

The SOC-ARC consists of members invited by the FAA, representing aircraft, engine and avionics manufacturers, manufacturer associations and the FAA. The members were selected with the objective to include a wide range of stakeholders that have familiarity and experience with certification and system oversight processes, analyses and regulatory compliance. Additional subject matter experts (SME) were recruited by the ARC during the evaluation process to ensure adequate understanding of specific complex topics. The ARC members are listed in ***Appendix B***.

The final report from the SOC-ARC will be submitted to the FAA by December 31, 2018 and the FAA is committed to formally responding to the recommendations made by the ARC by March 31, 2019. The ARC will remain in effect until January 5, 2020, unless sooner suspended, terminated, or extended by the Administrator. The ARC may reconvene following the submission of the recommendation report for the purpose of providing advice and assistance to the FAA, at the discretion of the FAA Co-Chair, provided the charter is still in effect.

In the FAA Reauthorization Act of 2018, provisions were included requiring creation of a Transportation Secretary level advisory committee for Safety Oversight and Compliance (SOCAC). Many of the recommendations of the SOC-ARC have application to the FAA safety system beyond FAA AIR and should be considered for further evaluation and action by the SOCAC.

1.1 Organization of This Report

This report has four chapters. Chapter 1.0 presents a summary on the establishment of the SOC-ARC, it's composition and organization of this report. Chapter 2.0 discusses the ARC's specific tasking and the methodology, scope and considerations the ARC undertook to make its observations and develop recommendations. Chapter 3.0 presents the ARC's overarching recommendations to the FAA based on the detailed sub-team reports along with a series of general recommendations and endorsements which relate to current initiatives. These general recommendations are provided for FAA consideration of near-term collaborative efforts to develop the necessary implementation plans to achieve Transformation objectives. Chapter 4.0 contains the ARC's conclusion on its recommendations to improve the product certification process.

There are nine appendices which make up part of this report:

- Appendix A – SOC-ARC Charter
- Appendix B – SOC-ARC Members
- Appendix C – FAA Comprehensive Strategic Plan for AIR Transformation: Initiatives & Actions
- Appendix D – Aircraft Certification Process Review and Reform Recommendations
- Appendix E – Part 21 Certification & Safety Management System ARC Recommendations
- Appendix F – FAA Reauthorization Act of 2018: SOC-ARC Related Provisions
- Appendix G – Compliance Assurance Working Group Report
- Appendix H – Flight Standards Integration Working Group Report
- Appendix I – Performance Measures & Feedback Loops Working Group Report

2.0 Background

2.1 Overview

2.1.1 FAA Aircraft Certification Service (AIR) Transformation Initiative

In 2016, the FAA engaged with industry stakeholders to provide an overview of the Aircraft Certification Service (AIR) Transformation initiative and to discuss opportunities for industry to provide input toward a shared future vision for certification and oversight and the development of strategic implementation plans for the vision. The intent of AIR Transformation is to create an Aircraft Certification Safety System that is more responsive to stakeholder expectations and changes in the environment.

The AIR Transformation Strategy is presented in three layers:

1. The **Blueprint Strategic Vision** contains high level messaging of intent and approach for reforming the Aircraft Certification Safety System.
2. The **Comprehensive Strategic Plan** **(CSP)** establishes detailed requirements for achieving transformational change across all components of the Aircraft Certification Safety System. The CSP is a living document and will incorporate future changes as the aviation industry and certification evolves.
3. The **Integrated Implementation Plan (IIP)** is a set of detailed plans and measures to ensure successful implementation of the strategic intent. AIR is currently in the process of developing the individual implementation plans, which when combined, will make up the combined IIP.

As a first step towards realizing this transformation, AIR stood up the Organizational Performance Division to monitor and assess the overall internal health of AIR and provide strategic leadership for planning and change management within the organization. In July of 2017, the service further reorganized into functional divisions. This phase involved the alignment of AIR's existing local offices, such as Aircraft Certification Offices (ACOs), Standards Staffs, Technical and Administrative Support Offices, Manufacturing Inspection Offices (MIOs), and Manufacturing Inspection District Offices (MIDOs), into functional divisions.

The FAA's stated desire throughout the process has been to maintain a high level of stakeholder involvement during the course of the AIR Transformation. In September 2016, a joint FAA/industry team was established to provide an overview of AIR Transformation objectives and to develop a joint

vision for transforming the Aircraft Certification Safety System. The team, made up of representatives from the FAA, aviation industry associations, individual aerospace firms, labor partners, and MITRE, was tasked with providing input to the Transformation strategy. As an initial step, the team reviewed and endorsed the FAA draft report titled "A Blueprint for AIR Transformation" as a common vision for improving the effectiveness and efficiency of certification processes. This vision was later published by the FAA in March 2017. The team also agreed to establish four working groups to provide recommendations for incorporation into the CSP in the areas of: *The Accountability Framework*, *Risk Based Decision Making*, *International Partnerships*, and *Fostering Innovation*. The four working groups provided recommendations that were considered by the FAA for inclusion in the CSP. On July 18, 2018 the CSP was signed by AIR's executive leadership team and widely broadcast to the FAA workforce and all stakeholder groups on August 31, 2018. This collaborative effort helped reinforce the value of collaboration between the FAA and industry and provided a foundation for future cooperation through the SOC-ARC. ***Appendix C*** summarizes the CSP initiatives and complementary stakeholder actions.

2.1.2 SOC-ARC Initiation

The Safety Oversight and Certification Aviation Rulemaking Committee (SOC-ARC) was formed to serve the next phase of the AIR Transformation planning and development. In this phase, the aviation community was asked to provide final feedback for the initial release of the CSP and to provide initial recommendations for implementation plans, including changes to policy, regulations and guidance materials. An ARC is a well-established structure for the FAA to request industry input on specific topics including changes to policy and regulation. The First Edition of the FAA Comprehensive Strategic Plan for AIR Transformation, released in July 2018, states that the SOC-ARC was formed to establish a channel for AIR-Industry engagement and continued collaboration:

> Continuing AIR – Industry Engagement
>
> Transformation requires commitment to change from all parties. This strategic plan reflects the perspectives of leadership and subject matter experts throughout AIR as well as U.S. Industry. Continued engagement between AIR and Industry is critical to ensure the successful development and implementation of a thorough, well-reasoned strategy. The Safety Oversight and Certification Aviation Rulemaking Committee (SOC-ARC) was formed in January 2018 to establish a channel for this engagement.
>
> The initiatives in the CSP identify stakeholder complementary actions that are integral to Transformation. Joint implementation of the initiatives in this plan will, in many areas, require research and experimentation through limited pilot projects. The SOC-ARC will coordinate those activities, collecting lessons learned that can be employed in the next round of experimentation and contribute to recommendations for regulations and policy. Additionally, the SOC-ARC will spearhead Industry's collaboration with AIR to develop shared performance metrics and support the collection and analysis of Industry data under appropriate safeguards. The SOC-ARC will provide a channel for necessary dialogue to support coordination between AIR and Industry.
>
> *Comprehensive Strategic Plan for AIR Transformation (July 2018)*

2.1.3 SOC-ARC Charter

The FAA tasked the ARC to identify and recommend initiatives and actions to improve the efficiency and effectiveness of the certification and safety oversight system. The ARC is expected to make recommendations to address policy issues facing the aviation community that are related to FAA safety oversight and certification programs and activities, and the existing FAA regulatory structure and

changes that may improve the FAA safety oversight and certification system. The charter specifies that the ARC consider the following in making its assessment:

1. The existing FAA regulatory structure (and supporting guidance material as needed) and changes that may improve the FAA safety oversight and certification system.
2. Current industry processes for meeting standards and ensuring compliance as well as self-monitoring; self-reporting and self-correcting and the changes that are needed to implement safety management systems.

The FAA tasked the ARC to submit its recommendations to the sponsor, Executive Director of Aircraft Certification Service (AIR-1), through the FAA co-chair by December 31, 2018.

2.2 Methodology and Scope

2.2.1 SOC-ARC Considerations

The ARC took a broad view of the charter provided by the FAA, and viewed as in scope, all regulations, processes, and activities related to aircraft certification, including those on or across boundaries into other FAA functions and organizations. With the broad scope, but limited time allocated for the ARC, however, the team understood the need to bound the activities of the ARC to provide meaningful input to the FAA.

In conducting its assessment, the ARC decided to narrow the focus of the effort on a few prioritized topics while also providing general recommendations for continued or follow on efforts. To bound the scope, in the first meeting, the team identified industry priority CSP areas or initiatives, which would provide greatest near-term value for stakeholder input toward development of detailed implementation plans.

The ARC formed three working groups to conduct in-depth assessments and develop specific recommendations on the following topics:

- Compliance Assurance
- Flight Standards Integration
- Performance Measures and Feedback Loops

The FAA wishes to investigate a future model in which a company might implement a Compliance Assurance System that allows it to Determine Compliance within its sufficiently robust system. The Compliance Assurance Working Group focused on defining the elements of a Compliance Assurance System, which could permit a company to systemically determine compliance and FAA to rely on these determinations with appropriate systems oversight. The team's report details out the elements and what the expectations around each one required to have a successful system.

The Flight Standards Integration Working Group examined the current state of integration of AIR and AFS efforts to manage and coordinate the type certification process more effectively, and that AFS' role be more clearly defined. The team also examined areas of potential improvement for validation coordination and entry into service activities as it is aligned with the AIR Transformation objectives.

The Performance Measures Working Group focused on developing metrics to support the vision laid out in the CSP. They examined the four desired outcomes along with the high priority initiatives to develop

a set of recommended measurements to gauge effectiveness. The output from the team is a set of recommended measures that can be mapped back to the four desired outcomes of the CSP.

2.2.2 Previous Certification Process Reviews & Recommendations

The Aircraft Certification Process Review and Reform Aviation Rulemaking Committee (ACPRR-ARC) report submitted to FAA and Congress in 2012 included a review of previous reports that recommended changes to the certification process.

These reports were prepared by independent expert bodies such as the U.S. Aerospace Commission and National Research Council, as well as oversight agencies such as the U.S. Government Accountability Office (GAO) and the U.S Department of Transportation Office of the Inspector General (OIG). Some of these reports focused on specific FAA programs such as organization designation authorization (ODA) and risk-based resource targeting (RBRT) tools and provided recommendations to improve implementation and effectiveness of FAA program management and safety oversight. Other reports assessed the rapidly changing aviation environment (increased growth in industry activity combined with the accelerated development of new technology and products) and provided recommendations for reengineering the FAA certification processes to meet future challenges and continue to improve safety levels.

Several independent assessments of the certification process found that industry development of new aviation products and technologies is expected to continue growing at a pace that far exceeds the FAA ability to support. The reports provided recommendations to reform, streamline, and reengineer the certification process to meet future challenges. A common theme among these recommendations is shifting the FAA certification process from a detailed product approach toward a systems safety approach. This is reflected in the following two reports that served as a basis in support of the FAA Aircraft Certification Service (AIR) Transformation Initiative and the Federal Aviation Administration Reauthorization Act of 2018 on FAA Safety Certification Reform.

Aircraft Certification Process Review & Reform (ACPRR) Report to Congress – FAA accepted and submitted to Congress a report by a joint industry/FAA ARC that reviewed both the aircraft certification activity and the status of recommendations in previous reports; assessed certification and approval processes; and developed recommendations to improve efficiency and support the development of new technology and enhance the global competitiveness of the U.S. aviation industry. The FAA has limited capacity and must handle competing priorities because it supports the entire product life cycle including continued operational safety (COS), rulemaking, and certification, and must address certification of new technologies such as unmanned aircraft systems. The ARC observed many existing improvement initiatives for certification process efficiencies are already implemented or in progress. However, the FAA has not fully integrated these initiatives, overseen their implementation, measured their benefits, or clearly linked them to a future state.

Recommendations relate to streamlining the product certification process, reengineering the product certification process and improving efficiency and effectiveness within AIR to redirect resources to support aircraft certification. The ARC believes the best opportunity for efficiency gain today in the current state of the certification process is to (1) develop comprehensive implementation plans and a tracking a monitoring process to ensure effectiveness, and (2) maximize delegation to the greatest extent in current delegation systems, preparing for the future of a systems approach to certification and safety oversight such as CDO.

A summary of the following ACPRR recommendations is available in ***Appendix D***:

- Integrated Roadmap and Vision for Certification Process Reforms
- Culture and Change Management
- Comprehensive Means to Implement and Measure the Effectiveness and Benefits of Certification Process Improvements
- Enhanced Use of Delegation
- Update Part 21 to Reflect a Systems Approach for Safety
- Process Reforms and Efficiencies Needed for Other AIR Functions

Part 21/Safety Management Systems (SMS) Aviation Rulemaking Committee Report to FAA - The ARC recommends a building block approach to implementing structured approval and oversight of design organizations (DO), which includes establishing a clear accountability framework, transitioning the FAA's oversight of design activities to a centralized systematic model, optimizing use of ODA, and implementing new organizational and SMS requirements. With successful implementation of these building blocks and voluntary DO approval, the ARC supports future rulemaking to consider mandatory DO approval or certification.

A summary of the following Part 21/SMS ARC recommendations is available in ***Appendix E***:

- Full Utilization of ODA & Acceptance of Enhanced Applicant Showings
- Minimum Applicant/Holder Qualifications & Responsibilities
- Establishment of DO Requirements, Privileges and System Oversight
- SMS Requirements
- Evolution of FAA Oversight Toward Performance Based Systems Safety Approaches
- Part 21 Cleanup and TSO Modernization

2.2.3 CMT Collaboration Strategy & Bilateral Technical Implementation Procedures

The FAA, EASA, TCCA and ANAC established a governance structure for a joint 'Certification Management Team' (CMT) and signed a *CMT Collaboration Strategy* document in May 2016, which establishes an international cooperation vision among these leading state-of-design authorities "to use active confidence building initiatives and risk based validation principles to accept partner certification activities with limited or no technical involvement." The FAA press release stated that "This is a significant expansion of previous initiatives, which allows the authorities to maximize their reliance on the certificating authority as much as possible."

The CMT Collaboration Strategy establishes the vision, objectives, and strategic focus areas to improve cooperation and the performance of activities under their respective bilateral agreements by proactively managing implementation to eliminate redundant activities and reduce the level of involvement of the authorities in validating each other's work. This is the first time FAA and the partner CMT authorities have formally stated this objective in writing and specified a plan on how to significantly improve the effectiveness and efficiency of international cooperation to eliminate or reduce redundant activities and the non-value burden on industry and authority resources.

FAA implements the CMT strategy in cooperation with each respective bilateral partner authority through building and maintenance of confidence in respective certification and safety oversight systems and defined implementation procedures. Revision 6 of the EASA-FAA Technical Implementation Procedures for airworthiness and environmental certification (TIP) is the first major milestone on the

FAA-EASA Validation Improvement Roadmap to implement the CMT Strategy toward a risk-based approach to reduce and further eliminate redundant authority involvement.

One of the most important strategic focus areas of the CMT Strategy implemented by the FAA-EASA TIP6 is a three-tiered, risk-based approach for validation of all certificates and approvals:

1. **Reciprocal Acceptance** whereby the original approval is accepted in the other authority's system (e.g., initial implementation includes Technical Standard Orders for equipment, maintenance repair data and alterations on import aircraft; etc.)
2. **Streamlined Validation** where there is no technical involvement for the issuance of a validated design approvals based on risk and confidence (e.g., initial implementation for all basic design approvals, including piston engine and propeller type certificates)
3. **Validation Work-Plan approach to manage projects appropriate for** Validating Authority technical involvement due to risk, new/novel technologies and design features, or significant regulatory differences. The workplan identifies level of involvement by the validating authority, which is established upfront through risk-based principles rather than by a comprehensive review of compliance findings, and incorporates active management oversight to ensure common principles and procedures are applied to maximize reliance on the certifying authority's findings.

The CMT collaboration strategy vision "to use active confidence building initiatives and risk based validation principles to accept partner certification activities with limited or no technical involvement" is consistent with the previous recommendations for improving the effectiveness and efficiency of FAA certification processes and the objectives of the AIR Transformation and industry stakeholder groups. The SOC-ARC considered the CMT collaboration strategy and implementation procedures in the FAA-EASA TIP 6 when developing its recommendations, particularly as it related to international collaboration and global acceptance of US type certificated products and aviation equipment.

2.2.4 FAA Safety Certification Reform Provisions of the FAA Reauthorization Act of 2018

The FAA Reauthorization Act of 2018 signed into law October 8, 2018 (P.L. 115-254) includes several provisions in the sections on FAA Aircraft Certification Reform, FAA Flight Standards Reform, Safety Workforce and International Aviation, which directly relate to the scope and tasking of the SOC-ARC. A summary the provisions related to the SOC-ARC charter is provided in ***Appendix F*** and the complete Bill is available at the following link: https://www.congress.gov/115/bills/hr302/BILLS-115hr302enr.pdf.

These provisions largely reflect the ACPRR report to congress and follow-on inputs from stakeholders and certification process improvement initiatives currently underway, which were also considered by FAA and industry in developing and commenting upon the Blueprint and Comprehensive Strategic Plan for AIR Transformation. The SOC-ARC believes AIR Transformation and its recommendations are consistent with the objectives of the FAA Reauthorization Bill of 2018, but a review of the legislative text is necessary to ensure detailed provisions are addressed.

2.2.5 SOC-ARC Activities & Deliverables

The full SOC-ARC met four times during 2018 to complete the assigned tasking. Participation in ARC meetings and activities grew and evolved as the understanding of the subject areas became more

complete. Both industry and FAA participated at a high level in each of the meetings helping ensure a quality product from the team efforts.

Meeting #1 – Scoping and Planning
McLean, Virginia
3 April 2018
Primary Accomplishments:

- Scoping of assigned task and team approach
- Initial prioritization of topics
- Establishment of three (3) working groups with industry leads

The ARC formed three working groups to conduct in-depth assessments and develop specific recommendations on the following topics:

- Compliance Assurance
- Flight Standards Integration
- Performance Measures and Feedback Loops

The FAA wishes to investigate a future model in which a company might implement a Compliance Assurance System that allows it to determine compliance within its sufficiently robust system. The Compliance Assurance working group focused on defining the elements of a Compliance Assurance System that could permit a company to systemically determine compliance. The team's report details out the elements and what the expectations around each one required to have a successful system.

The Flight Standards Integration working group examined the current state of integration of AIR and AFS efforts to manage and coordinate the type certification process more effectively, and that AFS' role be more clearly defined. The team also examined areas of potential improvement for validation coordination and entry into service activities as it is aligned with the AIR Transformation objectives.

The Performance Measures & Feedback Loops working group focused on developing metrics to support the vision laid out in the CSP. They examined the four desired outcomes along with the high priority initiatives to develop a set of recommended measurements to gauge effectiveness. The output from the team is a set of recommended measures that can be mapped back to the four desired outcomes of the CSP.

Meeting #2 – Refining Scope
Arlington, Virginia
21-22 June 2018
Primary Accomplishments:

- Context of other ongoing improvement activities
- Industry feedback on Comprehensive Strategic Plan (CSP)
- Refinement of working group scope
- Confirmation of priority topics
- Addition of Subject Matter Experts (SME)

During this meeting, the ARC completed one of its specifically requested deliverables. The ARC industry members provided detailed comments on the May 2018 draft V.7 CSP document.

There is consensus support for the draft CSP recognizing the remaining challenge that this change is comprehensive and complex, and additional discussion and work is needed. It was noted that the CSP needs to do a better job in taking credit for the current state of the system and to recognize existing capability and maturity in industry compliance and FAA oversight processes where there has been significant experience and success.

The ARC identified the following areas requiring additional work and discussion to provide the information necessary to successfully advance among industry and FAA stakeholders:

- Applicant Maturity Model – key concept throughout the CSP that requires better definition and understanding. Important to identify key criteria/indicators to assess capability on this maturity model continuum. Current discussion does not adequately recognize and take credit for the significant level of capability and experience that exists and that this is a continuum on which each applicant and FAA PM can determine is appropriate based on their level of activity and resource needs.
- Risk Analysis Framework – key concept throughout the CSP so important for collaborative approach to further refine and advance risk model/tools
- Issues Resolution Processes – Additional reinforcement of Consistency and Standardization Initiative (CSI) and Partnership for Safety Plans (PSP)
- Change Management – critical to successful implementation
- Risks – it is critical to identify risks to achieve key initiatives and to take steps to mitigate those risks
- Flight Standards – integration into transformation planning, implementation and performance
- Schedule – Audience for AIR Transformation CSP will expect more information on specific implementation actions and expected outcomes

<u>Meeting #3 – Full Team and Sub-team Working Sessions</u>
Fort Worth, Texas
13-14 September 2018
Primary Accomplishments:

- Early review of draft sub-team content and recommendations
- First draft of general recommendations
- Tasks assigned for completing a draft of the final report by the end of November
- During this meeting, FAA provided a briefing update summary on the following key FAA initiatives and processes related to the priority areas identified by ARC for discussion: Current risk models (RBRTa, RBRTo, FAR risk prioritization, etc)
- Transformation initiatives/actions to revise/update risk models to align with the vision, blueprint and CSP
- Innovation center concept and how it integrates and affect certification process and traditional applicant/FAA interface. Plans for implementation
- Compliance library concept and objectives/expectations on how it affects certification process
- Transformation business architecture

Meeting #4 – Final Report Comments Prior to Submittal
Arlington, Virginia
10 December 2018
Primary Accomplishments:

- Full draft review and comments
- Assignment of final editing tasks
- Concurrence for report submittal

3.0 Recommendations

The primary focus of efforts during the SOC-ARC meetings was on the prioritized topics addressed by the sub-teams established by the ARC in the areas of Compliance Assurance, Flight Standards Integration and Metrics & Measures. A summary of each team's detailed findings and recommendations along with the ARC's overall recommendations is captured in this section. The complete sub-team reports are included in the appendices as they provide detailed information for consideration by FAA in addressing the ARC's overall recommendations. There were several additional important topics identified and briefly discussed by the ARC but time and resource constraints did not allow for deliberate consideration. However, the ARC prioritized those that warrant near-term consideration for collaborative FAA/industry discussion as they relate to current implementation and industry/FAA initiatives. These topics along with other policy, communication, organization and implementation recommendations are provided as general recommendations at the close of this section.

The SOC-ARC notes that its recommendations for AIR Transformation and the objectives and initiatives outlined in the Blueprint and Comprehensive Strategic Plan identifies numerous improvement opportunities which are very broad to encompass FAA organizations and processes beyond the Aircraft Certification Service (AIR). The development, implementation and oversight of recommendations and initiatives necessary to realize the objectives of AIR Transformation will require ongoing FAA-Industry collaboration far beyond the 2-year charter of this SOC-ARC. This should include the recommendations of this ARC and its working groups as well as current improvement activities endorsed by the ARC in this report and related future activities by both FAA and industry necessary to realize the benefits of a systems-based approach to certification and safety oversight. Therefore, the first recommendation focuses on the importance of FAA continuing constructive engagement with industry to implement further changes and improvements through an appropriate collaboration vehicle.

> **Recommendation 1 – FAA/Industry Collaboration:** The SOC-ARC recommends that FAA continue constructive engagement with industry to develop and implement further changes and improvements to certification and system oversight processes through an appropriate collaboration mechanism such as an ARC.

3.1 Compliance Assurance Working Group Summary

The Compliance Assurance Working Group developed recommendations for a scalable structure underpinning a systems-based approach to compliance assurance. By using a systems-based approach, the ARC hopes that the design oversight function of the FAA will be able to enjoy many of the same safety and oversight-efficiency advantages that the FAA has enjoyed through a systems-approach to production approval.

The Working Group report enclosed as ***Appendix G*** provides a detailed description of the following three elements which serves as the basis for the ARC recommendation:

- FAA adopt a path for companies to implement FAA-recognized Compliance Assurance Systems. Under a Compliance Assurance System, a design approval applicant would be able to use its system to make compliance determinations. Successful implementation of a Compliance Assurance System by a design approval applicant would permit the FAA to rely on such audits as means of mitigating risk, and to permit the FAA to conclude that designs that are determined compliant by a properly functioning system would inherently comply with the requirements of FAA regulations. The team report recommends the specific elements of such a system. These elements describe a system that is sufficiently robust to ensure (1) an accurate determination of compliance, (2) a system capable of being audited by the FAA, and (3) a safety risk mitigation upon which the FAA may rely in making safety decisions.
- FAA adopt procedures for oversight of Compliance Assurance Systems, as well as a description of the privileges associated with such systems.
- FAA consider a phased approach to implement Compliance Assurance Systems, using a pilot program followed by a voluntary compliance program in advance of a certificated program.

Recommendation 2 - Compliance Assurance System: The SOC-ARC recommends a framework for FAA to recognize and oversee a design approval holder/applicant organization's Compliance Assurance System to make compliance determinations that the FAA can rely upon for issuance of a design approval with consideration of the elements, procedures and phased implementation approach outlined in the Compliance Assurance Working Group report (reference Appendix G of this report).

3.2 Flight Standards Integration Working Group Summary

When reviewing the draft AIR Business Architecture which maps the certification process from a functional perspective, the ARC noted that interfaces and coordination with Flight Standards, particularly the Aircraft Evaluation Group (AEG), are not clearly defined. Manufacturers work closely with AEG offices and have working relationships and processes, but these can be inconsistent and not typically integrated as part of type certification program which often results in redundant activity and issues which impact type certification program cost and schedule. In addition, discussion highlighted the importance that this WG consider all activities necessary for development of new aircraft to include certification design approval through entry into service of new products as manufactures have

experienced significant impact in the effectiveness and efficiency of delivering newly type certificated aircraft and support entry into service by customers worldwide.

The Flight Standards Integration Working Group was established to review current policy and experiences regarding Aircraft Certification and Flight Standards roles and integration for conducting activities to support type certification, operational evaluation/suitability and entry into service of new aircraft. This includes requirements, policy and processes for type certification activities and functions conducted by the Aircraft Evaluation Group (AEG) and Flight Standards District Office (FSDO) such as acceptance of Aircraft Flight Manual (AFM) and Instructions for Continued Airworthiness (ICA); conducting Flight Operational Evaluation Board (FOEB); establishment of Master Minimum Equipment List (MMEL) and aircraft evaluation for issuance of operational Letters of Authorization (LOA).

The WG found that there is not a clear understanding of requirements nor detailed processes and guidance for AFS integration with AIR and applicant/manufacturer during development of new products. For example, there is not a process for early definition of requirements, acceptable means of compliance and schedule as part of certification planning early in a program to facilitate the ability for applicants to effectively and efficiently obtain the desired approvals and FAA documents necessary to support certification, delivery and operation of new products.

The Flight Standards Integration WG focused their discussion in three priority areas: type certification program management, international coordination and validation with bilateral partners, and streamlined operational evaluation processes. The Working Group report enclosed as ***Appendix H*** provides a detailed description of the issues and proposals which serves as the basis for the ARC recommendations.

3.2.1 Aircraft Type Certification Program Management

The first area addressed by the WG is aircraft type certification program management including coordination, responsibility and accountability for project specific certification planning and performance to the plan. Focus areas are the regulatory requirements associated with type certification that are performed by the AEG (i.e. AFM, ICA and associated supplements). In general, the WG recommends that AIR and AFS manage and coordinate the type certification process more effectively from the beginning of a program and that the role of AFS be more clearly defined in FAA guidance. The following summarizes the WG's findings in this area and the ARC recommendation.

- Policy and guidance regarding the type certification process (i.e. AIR Order 8110.4, AFX Order 8100.9, etc) and even the FAA & Industry Guide to Certification (CPG) identifies specific activities that must be coordinated or conducted by AEG, but do not provide appropriate processes or instructions regarding roles & responsibilities as part of certification project planning, performance and management.
- AIR and AFS should manage and coordinate the type certification process more effectively with the project ACO and AEG functioning as an integrated program management unit and the role of AFS should be more clearly defined in FAA guidance.
- A single AIR program manager should be designated with full responsibility for certification project performance (Note: AEGs would continue to function within the Flight Standards organization; however, AEG representatives assigned to a certification project would have a dotted line reporting relationship to the certification project manager),

- FAA resources should be focused on new/novel design features and higher-risk activities while increasing the use of applicant compliance assurance systems and expanding delegations of operational activities,
- AEG activities should be completed in parallel with TC activity to the maximum feasible extent,
- Airworthiness and operational issues should be identified early in a certification project and late changes that adversely impact the timing of the project and/or delay aircraft delivery, entry into service and/or customer operations should be discouraged.

ARC discussion noted that stronger ties are needed between flight standards and aircraft certification and that AFX/AEG/AFS need to engage early in a certification project to define applicable requirements, establish agreed certification plan (including method of compliance, delegation planning and schedule), and determine systems oversight (i.e. level of project involvement in critical path versus post review). In addition, the ARC noted that integration and coordination necessary to support the development and entry into service of new aircraft and technologies should include any and all necessary safety organizations and not be limited to AIR & AFX. For example, there are some current product development activities for emerging aircraft, technologies and operational models which require system level safety considerations for requirements and oversight with the ability to shift traditional mitigation approaches between vehicle, operations and airspace to achieve the desired safety outcomes.

Therefore, the ARC recommendation is for an integrated program management framework for new product development certification and entry into service and the importance of enhancing regulatory consistency and system oversight through integration across FAA functional divisions: vehicle, operations and airspace. The desired outcome is not about an organizational reporting structure, but the ability of FAA project managers to work an entire certification project, including coordination and management of issues and resources from across FAA organizations. To be effective and successful, the project managers need to have the responsibility, authority and accountability to work project management issues. Recognize that FAA SME engagement from different offices that report through different organizational management structure (i.e. ACO, Standards staff, MIDO, AEG, AGC, etc.), but program manager needs responsibility, authority and accountability to manage all FAA aspects of the program. The necessary internal processes/mechanisms needed to ensure engagement of SMEs (i.e. AEG) at appropriate phases of program, performance to agreed schedules and issues resolution through appropriate management chain to address/resolve issues/performance when needed.

> **Recommendation 3 – Integrated Program Management:** The SOC-ARC recommends establishment of an integrated program management framework with responsibility and accountability for type certification and operational evaluation project planning, coordination and performance among AIR, AFX and any other FAA policy and field office necessary for issuance of design approvals and entry into service with consideration of the elements outlined in the Flight Standards Integration Working Group report (reference Appendix H of this report).

3.2.2 International Coordination and Validation

The second area addressed by the WG is international coordination and validation of flight standards activities for certification and entry into service of new products. The following summarizes the WG's findings in this area and the ARC recommendation.

In general, the WG recommends that FAA implement the principles outlined in the Certification Management Team (CMT) Strategy agreement between FAA, EASA, TCCA and ANAC and accelerate the establishment of procedures and maintenance of confidence necessary for mutual acceptance of AFM, ICA and operational evaluations and approvals to include MMEL. The FAA-EASA Technical Implementation Procedures (TIP Rev. 6) establishes a framework for this level of cooperation but flight standards specific implementation procedures are necessary to realize the intended benefits. The desired outcome is for bilateral partners to rely on the Certificating Authority to the maximum extent possible for operational evaluation aspects to eliminate duplicate technical evaluations through mutual acceptance or streamlined validation. This would include EASA acceptance of FAA operational evaluations to meet their Type Certificate requirements for Operational Suitability Data (OSD) to include flight crew type rating, approved training syllabi, simulator data and MMEL.

> **Recommendation 4 – Bilateral Cooperation of Operational Evaluations:** The SOC-ARC recommends the FAA work with bilateral partners to establish procedures which maximize reliance on each other's systems for operational evaluation of new aviation products and eliminates duplication through acceptance or streamlined validation based on confidence with consideration of the elements outlined in the Flight Standards Integration Working Group report (reference Appendix H of this report).

3.2.3 Streamline Operational Evaluation Processes – Current Initiatives

The third area addressed by the WG is a review of operational evaluation processes relating to entry into service for new design aircraft, delivery of new production aircraft and support for customer operations to identify opportunities to streamline and improve effectiveness and efficiency. The focus is on processes for development and issuance of the following:

- MMEL – including consideration of making it a TCH document similar to EASA/TCCA
- Flight Standardization Board (FSB) - operational evaluation/suitability activities to include coordination with function & reliability flight testing and schedule for release of type rating and training information necessary to support customer entry into service, and
- Letters of Authorization – to eliminate redundant and inconsistent AFS review of aircraft airworthiness and better leverage FAA approvals and certification documents

Most of the issues and proposals discussed by the WG were identified in various letters and briefings that manufacturers and manufacturing industry trade associations have raised with Flight Standards over the past couple years. At the September 2018 ARC meeting, Flight Standard provided a briefing to the ARC on a response it sent to the manufacturing industry associations dated August 10, 2018 with a consolidated action plan to address each of the issues raised. In addition, some joint FAA/industry initiative been chartered to develop detailed recommendations to specific issues which are fully supported by the Flight Standards Integration WG: ODA Continuous Improvement Team AEG Flight Manual Supplements (FM-S WG), Air Carrier Training ARC – FSB WG and Letter of Authorization Process Improvement WG (LOAPI WG).

To minimize duplication of effort and ensure an integrated industry collaboration and input to FAA, the SOC-ARC decided to endorse and support these current initiatives and is not providing specific recommendations in this area. The WG report provides a summary of specific issues and

recommendations being considered by these current initiatives and the ARC General Recommendation 10 provides its endorsement and support for these activities.

3.3 Performance Measures and Feedback Loops Working Group Summary

The Performance Measures and Feedback Loops Working Group reviewed the CSP measures for each of the four desired outcomes: 1) manage operational risk across the safety continuum, 2) reduce the time for approval decisions, 3) increase schedule predictability of approval decisions, and 4) increase AIRs productivity. The WG assessed each measure and report enclosed as ***Appendix I*** provides a detailed assessment and recommendations on any proposed changes and examples of how data could be captured and presented. The following provides a high level summary which serves as the basis for the ARC recommendation:

- Monitor progress of FAA/Industry efforts to put in place elements that support safety and a Just Culture such as the increase in industry approvals of voluntary SMSs, PSPs and monitor performance of the voluntary disclosure reporting program, FAA compliance philosophy, and AD compliance
- Implement simple measures to increase the efficiency and effectiveness, specifically quality and timeliness (or flow time), of critical project tasks such as issue papers, responses to project specific certification plans, responses to compliance submittals, and finally, level of FAA involvement by project based on measured risk
- Well defined measures assist in shifting the culture and help encourage ideas to complete work in more efficient and effective ways while also showing performance to targets. These are the measures most worth putting in place.
- Consider focusing on fewer of the 10 initiatives first and monitoring progress as well as external factors such as lessons learned on 14 CFR Part 23 performance based regulations and validation roadmaps prior to taking on additional improvements.
- Measures aren't necessary to show progress for each desired outcome. The team made observations in how the desired outcomes interact and contribute to one another and how focusing on Lean principles will likely lead to a more productive AIR. That productivity could be observed in how resources are utilized on focus areas such as global leadership and validation or developing high priority regulations and policy. See the Performance Measures and Feedback Loops report for more detail.

In addition, ARC discussion highlighted some of the WG's general observations which are applicable across the full scope of the ARC and WGs. Several initiatives reference bilateral partners and their systems in terms of acceptance, streamlined validation and validation however no measures of success or what a desired outcome should be is associated specifically with these efforts. When discussing applicant maturity, it is noted use of term maturity could be misunderstood. This was reinforced in a briefing by the CPG-IT who conducted a workshop at the Fort Worth regional office and received the same feedback. ARC discussion suggests the FAA CSP should use a more appropriate term than 'applicant maturity' such as 'applicant capability' along with a more specific description to define the necessary attributes of how to define capability against increased applicant privileges that would serve to reduce workload on the FAA for those applicants with a strong Just Culture and capable of showing compliance. The WG notes the importance that all success measures and initiatives need to be scalable from a smaller applicant with fewer projects to a larger OEM that has many projects. In addition, these

must stay in alignment with other goals such as encouraging industry to voluntarily implement SMS, efforts to increase visibility and utilization of PSPs, ODA Scorecard, FAA and Industry Guide to Product Certification or CPI Guide, etc.

> **Recommendation 5 – Metrics & Measures:** The SOC-ARC recommends simplifying the measures outlined in the CSP in both total number and complexity of data and prioritizing implementation of the most impactful measures near-term and consideration of the assessment and recommendations for each measure outlined in the Performance Measures and Feedback Loops Working Group report (reference Appendix I of this report).

3.4 General Recommendations

During the deliberations of the SOC-ARC, several important issues were raised by members which are beyond the narrow scope of focused working groups. The ARC discussed the issues and those determined to be priorities are identified below as general recommendations which warrant near-term consideration by FAA. Sections 3.4.1 through 3.4.3 are recommendations (6 through 9) for systemic process improvements. Section 3.4.4 and recommendation 10 provides the SOC-ARC's endorsement for current initiatives already underway which should be prioritized consistent with the CSP. Sections 3.4.5 through 3.4.7 are recommendations (10 through 14) for new actions/initiatives for FAA consideration.

3.4.1. System Oversight:

Current State – Existing models used for assessing project, applicant risk and applicant performance may not reflect the current state of industry capability or regulatory oversight philosophy. This is discussed in detail in CSP Initiative 2 to establish system oversight of compliance assurance systems which is essential to successfully implementing and achieving the intended benefits of industry compliance assurance systems as discussed in CSP Initiative 1 and SOC-ARC recommendation 2. In addition, a system oversight model that integrates AIR's domestic and international processes Reference CSP Initiative 2A) would support implementation of the Flight Standards Integration WG recommendations.

> **Recommendation 6 – System oversight:** The SOC-ARC recommends FAA engage industry in a collaborative initiative to examine current practices and implementation plans related to project and applicant risk and performance assessments, how these will evolve to align with CSP Initiatives 1 & 2 and the 2018 FAA reauthorization requirements. The recommendation will address how FAA and industry will periodically review that the respective oversight actions and systems are functioning as intended and identify further changes that may be necessary.

3.4.2. Regulatory Consistency & Issues Resolution:

Current State – Industry has identified inconsistent interpretation and/or application of regulatory requirements as one of the leading impacts on performance of certification program planning and execution. For example, requirements can be made more restrictive through guidance, policy, issue papers and personnel interpretation that reflect regulatory "Creep" or rulemaking by policy where acceptable means of compliance significantly change over time or across projects without any change to the regulation itself. In general, an acceptable means of compliance should always continue to be an

acceptable means of compliance on future projects unless there has been specific determination of a non-compliance and design discrepancy and such decision being made available. The Consistency of Regulatory Interpretation ARC and associated FAA report to Congress in July 2013 identified the need for clear regulatory requirements, regulatory application training and culture as the root causes for ongoing inconsistent interpretation by and between AIR and AFS. It is important to address these issues and mitigating root causes to facilitate regulatory consistency as we transition to systems approach to certification and oversight. In the event of a disagreement at the program level that cannot be resolved in a timely manner, the SOC-ARC recommends that there be a written issue resolution process that the applicant is encouraged to use, without fear of retribution.

Recommendation 7 - Issues Resolution: The SOC-ARC recommends a structured issues resolution process for rapidly resolving technical disagreements, such as those related to regulatory interpretation, application and acceptable means of compliance.

Recommendation 8 - Regulatory Guidance Library: The SOC-ARC recommends documentation of FAA decisions (such as issues resolution, CSI, white papers, and other policy interpretations), with the reasons for the decisions, archival of such decisions, and a searchable database of such decisions to allow both industry and FAA personnel to examine past decisions and use them to more efficiently identify compliance modes for future projects.

3.4.3. Change Management

Current State - Implementation of new policies and processes do not consistently result in desired improvement initiatives do not consistently result in at the project and field office level share common experiences of workforce behavior and culture not consistent with intended improvements. Some examples of recent initiatives in which change management principles would have been beneficial in implementation and realizing the intended improvements include:

- Agreed definition and execution of project management responsibility & accountability for planning and performance – both FAA and ODA managed projects
- ICA delegation authority,
- System recognition (i.e. ASO),
- No-PNL
- Streamlined avionics approvals. and
- Consistent use of issue papers

Recommendation 9 - Change Management: The SOC-ARC recommends FAA continue to focus on change management when implementing new policies, processes and initiatives to ensure that local office activities and performance are consistent with objectives and they achieve the intended outcomes for applicants.

3.4.4. Endorsement of Current Certification Improvement Initiatives

Current State – During the development of the CSP, FAA and industry identified some current certification improvement initiatives underway that are important activities which serve as a foundation for effective and efficient certification processes and consistent with the principles and objectives of AIR Transformation. During the SOC-ARC deliberations these were referred to as pre-CSP initiatives which should continue to be supported by FAA and industry to facilitate successful implementation and that

performance be assessed to ensure desired improvements and outcomes are realized. In addition, the Flight Standards Integration WG identified the Flight Standards Air Carrier Training ARC Flight Standards Board (FSB) WG and Flight Standards Letter of Authorization Process Improvement WG (LOAPI WG) as significant collaborative initiatives with the manufacturing industry which should be prioritized as consistent with the CSP and ARC recommendations. The ARC discussed each of these initiatives as it relates to the CSP and identified various comments/inputs for consideration by FAA and the respective joint FAA/industry teams.

A) ODA Scorecard & Metric Continuous Improvement Team (ODA-CIT)

- There has been great progress on addressing policy related issues that limit delegation and establishment of related success measures/metrics, all of which are improving. Additional work needed to ensure that ODA managed programs achieve the level of performance and efficiency intended to be realized. Continue to identify opportunities to address areas of high FAA involvement impacting critical path both in performance of FAA required activities such as certification basis, certification plan approval and issue papers; and FAA elective involvement in delegated areas such as review/approval of test plans, test witnessing, flight test, and late delegation decisions at the end of a program.
- Prioritize clarification of FAA ODA policy and training related to:
  - Oversight approaches – post document review vs participation vs retention
  - Retention - OMT rationale for retention should include the level of detail, information and understanding necessary to achieve the intent of providing coaching to the ODA for continuous improvement such that the activity would not be retained on the next program
  - ODA managed programs - certain FAA tasks/involvement appropriate for FAA managed programs (i.e. UM activities/performance) are conducted by the ODA.
- Consider development of next generation ODA success measures and metrics which capture certification and oversight system performance related to CSP desired outcomes to:
  - Manage Operational Safety Risk Across the Safety Continuum
  - Reduce the Time for Approval Decisions
  - Increase the Schedule Predictability of Approval Decisions
  - Increase AIR's Productivity

B) FAA & Industry Guide to Product Certification (Certification Process Guide – CPG)

- Prioritize the CSP activity for The FAA and Industry Guide to Product Certification (CPG) – "CPG Implementation focuses on broadly applying the principles of the guide in a consistent and sustainable manner within FAA and Industry. It educates FAA and Industry on the benefits of the CPG, reinforces the education through follow-up activities, and measures how effectively the CPG has been applied. The implementation also includes the creation of a process to regularly update the CPG to ensure its continued relevancy… It allows companies that demonstrate competence to have more control over the certification process, supports effective teaming between FAA and Industry, supports more predictable schedules, and provides transparency in decision making."

C) System Recognition / Applicant Showing Only (ASO)

- Some delegated organizations have revised their ODA Procedures Manual (OPM) to add ASO procedures but have not been able to gain traction with their OMT to gain approval for a matrix providing guidance on what regulations and areas applicant showing can be used for. While the FAA originally provided a list of low risk regulations that could be used for ASO, these rules are typically used in conjunction with other rules, thereby negating the majority of the benefit and still requiring Unit Member (UM) review and approval. Additionally, delegated organizations have concerns about the additional work and oversight required for limited benefit.
- Prioritize the CSP activity for Applicant Showing Only (ASO) – "This activity conducts a root cause assessment of the current ASO policy to identify the reasons for low industry adoption of the program. It will deliver a recommendation on whether to continue ASO development and how the program aligns with AIR's future state, specifically in the area of refreshing the certification strategy… It supports clarity in Industry and FAA roles in the certification process. It also supports moving toward a systems approach to safety, targeting AIR's involvement to the areas of highest safety risk and reducing AIR involvement in the certification process where Industry demonstrates competence."

D) Operational Evaluation Process Review and Streamlining Initiatives

- Flight Standard response to the manufacturing industry associations dated August 10, 2018 provide a consolidated action plan to address operational evaluation issues and proposals which is the same list considered by the Flight Standards Integration WG.
- The following joint FAA/industry initiatives have been chartered to develop detailed recommendations to specific issues: ODA Continuous Improvement Team (ODA-CIT) AEG Flight Manual Supplements, Air Carrier Training ARC – FSB WG and Letter of Authorization Process Improvement WG (LOAPI WG).

Recommendation 10 – Current Initiatives: The SOC-ARC endorses the following current certification improvement initiatives which support CSP initiatives and development of implementation plans and recommends that FAA implement changes necessary to achieve intended benefits and safety outcomes taking into consideration the SOC-ARC comments: ODA Scorecard & Metric Continuous Improvement Team (ODA-CIT), FAA & Industry Guide to Product Certification (Certification Process Guide – CPG), System Recognition (formerly referred to as Applicant Showing Only), Flight Standards Air Carrier Training ARC Flight Standards Board (FSB) WG and Flight Standards Letter of Authorization Process Improvement WG (LOAPI WG).

3.4.5. Prototype and Test Article Conformity:

Current State - FAA Order 8110.4C establishes a requirement for redundant FAA conformity inspections for test articles and test setups for Type Certificate, Supplemental Type Certificate, and Parts Manufacturer Approval projects. FAA conformity serves as an oversight spot check of 14 CFR 21.33 and 21.53 requirement for applicants to make all inspections and tests necessary to determine that materials, parts and products conform to type design and provide a statement of conformity before compliance test and certification. The FAA conformity process is extremely administratively burdensome for both industry and FAA and requires FAA personnel or its specially authorized designees to travel all over the U.S. and the world to conduct the redundant inspections. Bilateral partners EASA

and TCCA rely on approved/accepted manufacturer configuration management systems largely based on PAH quality system and first article inspection processes and do not conduct redundant conformity checks.

AIR Transformation and the CSP calls for the recognition and oversight of an applicant's system which should include conducting conformity in accordance with 14 CFR 21.33 and 21.53 allowing for an alternative to the policy requirement for redundant FAA conformity checks. This should provide for the acceptance of applicant system capabilities for specific functions/activities (i.e. AS9102 First Article Inspection and a First Article Inspection Report) up to a complete quality system for all certification activities to include materials, parts, products and test setup.

Recommendations for FAA acceptance and oversight of a manufacturer system for conformity have been provided by: ARAC in the 'ARAC Input to Support Regulatory Reform of Aviation Regulations – ARAC Addendum Report' (September 2017), Part 21/SMS ARC in the report 'Recommendations on Certification Procedures for Products and Parts' report (October 2014), and Part 23 Reorganization ARC report on 'Recommendations for increasing the safety of small general aviation airplanes certificated to 14 CFR part 23' (June 2013).

> **Recommendation 11 – Systems Approach for Conformity:** The SOC-ARC recommend that FAA update policy to provide for acceptance of applicant/manufacturer system for conformity and/or configuration management that satisfies 14 CFR 21.33 and 21.53 requirements in lieu of redundant FAA conformity checks.

3.4.6. Electronic Data Submittals and Responses:

Current State – Members of the FAA (ACOs, FSDOs, MIDOs) often direct industry to submit data via paper, a.k.a. "hard copy". The reasons range from having no budget to print out paper for their files, to not having the ability to store electronic copies for the required time. This is in spite of the existence of the Electronic Signatures in Global and National Commerce Act (ESIGN, Pub.L. 106-229, 114 Stat. 464, enacted June 30, 2000, 15 U.S.C. ch. 96). This is a federal law that allows the use of electronic records and electronic signatures.

> **Recommendation 12 – Electronic Data:** The SOC-ARC recommends that FAA prioritize implementation of e-data submittals and responses with a national initiative to drive implementation.

3.4.7. TSO Approvals:

Current State – *Pre-approval* - Even though a deviation has been previously approved, applicants for TSO authorization approvals are required to request approval for the same TSO deviation (or deviations) again for any current or future applications. Further, multiple companies often request the same TSO deviation, and each has to be approved separately, and repeatedly.

> **Recommendation 13 – TSO Deviations:** The SOC-ARC recommends that previously approved TSO deviations be included in a searchable database of regulatory and guidance information and to allow ACOs to 'locally approve' deviations for local projects based on the previous approvals.

Current state - *Post-approval* – TSO design approval procedures and requirements do not provide effective and efficient means for FAA and TSO design approval holders (DAHs) to address design

deficiencies identified post-approval. The wording in 14 CFR Part 45, Subpart B "Marking of Products and Articles" -- specifically in §45.10 (b) – says, "No person may mark a product or article in accordance with this subpart unless— …(b) That product or article conforms to its approved design, and is in a condition for safe operation; and, for a TSO article; that TSO article meets the applicable performance standards." If you can't mark a part as "TSO'd", you can't manufacture and ship it. Stated differently, the current TSO part marking requirements in §45.10 (b) -- do not provide for risk-based safety approaches for continued operation. This results in a complete stoppage of production and delivery of articles --*even when there is no safety impact*. That, in turn, often results in significant operational and economic impacts on production, including stopping delivery of new aircraft and grounding of aircraft in service. The Part 21/SMS ARC "TSO Sub-team Working Group Report" (reference summary in Appendix E of this report) provided a recommendation that FAA issue policy and/or spot amendment to Sec 45.10 TSO marking to allow for continued production and delivery in accordance with an FAA-accepted corrective action plan for TSO design deficiency that does not result in an unsafe condition. This is consistent with how similar deficiencies are addressed when identified in TC/STC design approvals. The SOC-ARC recommends that this be prioritized for implementation as soon as practical.

> **Recommendation 14 – TSO Continued Operational Safety:** The SOC-ARC recommends a policy revision and/or spot amendment to Sec 45.10 TSO marking to allow for continued production and delivery in accordance with an FAA-accepted corrective action plan for TSO design deficiency that does not result in an unsafe condition consistent with how similar TC/STC design approval deficiencies are addressed.

4.0 Closing Remarks

The industry stakeholders would like to commend the FAA leadership for the collaborative approach taken on its course through the FAA Aircraft Certification Service (AIR) Transformation Initiative. The chartering of this ARC was born out of ongoing collaborative efforts between industry and FAA to enhance aviation safety while reducing bureaucratic burden where possible. Industry recognizes that the FAA is engaged in substantial work on numerous fronts to streamline and improve the future state of the Aircraft Certification process and commends the FAAs commitment to ongoing engagement of both the workforce and industry stakeholders to realize the vision of the Transformation Initiative to meet the needs of the general public and aviation industry stakeholders.

Continuous engagement of both workforce and industry has been a key theme for the ARC and for the FAA. This report provides the ARC's recommendations for the priority areas of Compliance Assurance, Flight Standards Integration and Performance Measurement & Feedback Loops along with the detailed analysis and findings made by the respective working groups of subject matter experts on which the recommendations are based. In addition, the ARC identified several important areas for near-term actions and makes some general recommendations for collaborative efforts to develop the necessary implementation plans to achieve Transformation objectives.

While the FAA and its industry stakeholders have made great strides towards realizing the vision laid out by the FAA Aircraft Certification Service (AIR) Transformation Initiative, there is much work to be done to fully realize the intended outcomes and benefits. It is highly desired that the FAA and industry

stakeholders continue this collaboration through the SOCAC to take the system oversight ideas and principles and apply them across all aspects of the FAA safety system.

Appendices

Appendix A – SOC-ARC Charter

Appendix B – SOC-ARC Members

Appendix C – FAA Comprehensive Strategic Plan for AIR Transformation: Initiatives & Actions

Appendix D – Aircraft Certification Process Review and Reform Recommendations

Appendix E – Part 21 Certification & Safety Management System ARC Recommendations

Appendix F – FAA Reauthorization Act of 2018: SOC-ARC Related Provisions

Appendix G – Compliance Assurance Working Group Report

Appendix H – Flight Standards Integration Working Group Report

Appendix I – Performance Measures & Feedback Loops Working Group Report

Appendix A – SOC-ARC Charter

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Aviation Rulemaking Committee Charter

Effective Date: 1/5/2018

SUBJECT: Safety Oversight and Certification Aviation Rulemaking Committee

1. **PURPOSE.** This charter creates the Safety Oversight and Certification Aviation Rulemaking Committee (SOC-ARC) according to the Administrator's authority under Title 49 of the United States Code (49 U.S.C.) § 106(p)(5). The ARC will provide a forum in which Industry may evaluate the aircraft certification and safety oversight system and make recommendations for changes to the current regulations and guidance material. The sponsor of the ARC is the Executive Director of the Aircraft Certification Service. This charter outlines the ARC's organization, responsibilities, and tasks.

2. **BACKGROUND.** The aviation system is rapidly changing, placing greater demands on its participants. It is more complex, more interconnected, and more reliant on new technologies. Thus, the aircraft certification system in use today may strain to meet future demands, which could impact the ability of organizations in the aerospace industry (Industry) to continue to reach new global markets, without potential unnecessary delays, costs, or variations in service. Such inefficiencies may discourage innovation and jeopardize the development of future products that could further improve aviation safety.

   The FAA must engage Industry to obtain recommendations on how to best meet future demands on safety oversight and aircraft certification.

3. **OBJECTIVES AND TASKS OF THE ARC.** The purpose of the SOC-ARC is to provide a venue for Industry stakeholders to identify and recommend initiatives to improve the efficiency and effectiveness of the certification and safety oversight system.

4. **TASKS OF THE ARC.** The tasks of the SOC-ARC are:

   a. Review all components of the certification and safety oversight system, including:

      (i) The FAA's existing regulatory structure (and supporting guidance material as needed) and changes that may improve the FAA's oversight and certification system.

      (ii) Industry's current processes for meeting standards and ensuring compliance as well as self-monitoring; self-reporting and self-correcting and the changes that are needed to implement safety management systems.

   b. By December 31, 2018, submit a recommendation report that addresses:

      (i) Policy issues facing the aviation community that are related to FAA safety oversight and certification programs and activities, and

Initiated By: AIR-1

(ii) The FAA's existing regulatory structure (and supporting guidance material as needed) and changes that may improve the FAA's oversight and certification system.

The Industry Co-Chair sends the recommendation report to the FAA Co-Chair and the Director of the Office of Rulemaking. The FAA Co-Chair determines when the recommendation report and records, pursuant to paragraph (5), will be made available for public release.

The SOC-ARC is comprised of members from key stakeholders in the aerospace industry.

The SOC-ARC Co-Chairs may establish task groups (temporary subgroups within the ARC) to solve individual issues and report back to the full ARC on findings.

5. ARC PROCEDURES.

a. The ARC acts solely in an advisory capacity by advising and providing written recommendations to the FAA Co-Chair.

b. The ARC may propose related follow-on tasks outside the stated scope of the ARC to the FAA Co-Chair.

c. The ARC may reconvene following the submission of the recommendation report for the purposes of providing advice and assistance to the FAA, at the discretion of the FAA Co-Chair, provided the charter is still in effect.

6. ARC ORGANIZATION, MEMBERSHIP, AND ADMINISTRATION. The FAA will set up a committee of members from the aviation community. Members will be selected based on their familiarity and experience with the certification and system oversight process, analysis and regulatory compliance. Membership will be balanced in viewpoints, interests, and knowledge of the committee's objectives and scope.

The provisions of the August 13, 2014 Office of Management and Budget (OMB) guidance, "Revised Guidance on Appointment of Lobbyists to Federal Advisory Committees, Boards, and Commissions" (79 FR 47482), continues the ban on registered lobbyists participating on Agency Boards and Commissions if participating in their "individual capacity." The revised guidance allows registered lobbyists to participate on Agency Boards and Commissions in a "representative capacity" for the "express purpose of providing a committee with the views of a nongovernmental entity, a recognizable group of persons or nongovernmental entities (an industry, sector, labor unions, or environmental groups, etc.) or state or local government." For further information, refer to the OMB Guidance at 79 FR 47482.

Membership is limited to promote discussion. Attendance, active participation, and commitment by members is essential for achieving the objectives and tasks. When necessary, the ARC may set up specialized and temporary working groups that include at least one ARC member and invited subject matter experts from industry and government.

The ARC will consist of members from Industry. FAA and other Agency subject matter experts may be requested to participate as Observers and to provide technical support to the ARC members.

a. The FAA Sponsor will select the FAA Co-Chair, who will:

1. Select and appoint industry and the FAA participants as members,
2. Select the Industry Co-Chair from the membership of the ARC,
3. Ensure FAA participation and support from all affected lines-of-business,
4. Provide notification to the members of the time and place for each meeting, and
5. Receive any status report and the recommendations report.

b. The Industry Co-Chair will be appointed by the FAA from the industry members of the ARC. Once appointed, the Industry Co-Chair will:

1. Coordinate required ARC meetings in order to meet the objectives and timelines,
2. Establish and distribute meeting agendas in a timely manner,
3. Keep meeting notes, if deemed necessary,
4. Perform other responsibilities as required to ensure the objectives are met,
5. Provide status reports, as requested, in writing to the FAA Co-Chair, and
6. Submit the recommendation report to the FAA Co-Chair and the Director of the Office of Rulemaking.

7. **PUBLIC PARTICIPATION.** Meetings are not open to the public. Persons or organizations outside the ARC who wish to attend a meeting must get approval in advance of the meeting from the Industry Co-Chair and the FAA Co-Chair.

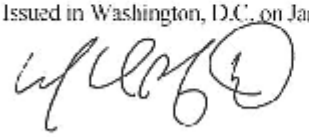
8. **AVAILABITY OF RECORDS.** Consistent with the Freedom of Information Act, Title 5, U.S.C., § 552, records, reports, agendas, working papers, and other documents that are made available to or prepared for or by the ARC will be available for public inspection and copying at the Office of Rulemaking, FAA Headquarters, 800 Independence Ave. SW, Washington, D.C. 20591. Fees will be charged for information furnished to the public according to the fee schedule published in Title 49 of the Code of Federal Regulations, part 7.

You can find this charter on the FAA Committee Database website at: http://www.faa.gov/regulations_policies/rulemaking/committees/documents/.

9. **DISTRIBUTION.** This charter is distributed to executive director-level management in the Office of the Associate Administrator for Aviation Safety, the Office of the Chief Counsel, the Office of Aviation Policy and Plans, and the Office of Rulemaking.

10. EFFECTIVE DATE AND DURATION. The ARC is effective upon issuance of this charter and will remain in existence for 24 months, unless the charter is sooner suspended, terminated, or extended by the Administrator.

Issued in Washington, D.C. on January 5, 2018.



Michael P. Huerta
Administrator

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SAFETY OVERSIGHT AND CERTIFICATION ARC

Proposed Member Organizations

CO-CHAIRs: Chris Carter, FAA; Industry co-chair tbd

Members from Industry:

Aeronautical Repair Station Association (ARSA)
Aerospace & Defence Industries Association of Europe (ASD)
Aerospace Industries Association (AIA)
Aircraft Electronics Association (AEA)
American Federation of State, County and Municipal Employees (AFSCME)
Bell Helicopters
Boeing
Duncan Aviation
Garmin
General Aviation Manufacturers Association (GAMA)
General Electric
Gulfstream
HEICO
Modification and Replacement Parts Association (MARPA)
National Air Traffic Controllers Association (NATCA)
Pratt & Whitney/United Technologies Corporation (P&W/UTC)
Professional Aviation Safety Specialists (PASS)
Rockwell Collins
Small Business Astronautics
Textron Aviation
Wipaire

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Appendix B – SOC-ARC Members

Co-Chairs:

Mr. Chris Carter, Co-Chair, Federal Aviation Administration, Aircraft Certification Service

Mr. Michael Thacker, Co-Chair, Bell

Members from Industry:

Mr. Bob Benjamin, Pratt & Whitney/United Technologies Corporation

Mr. Walter Desrosier, General Aviation Manufacturers Association (GAMA)

Mr. Jason Dickstein, Modification and Replacement Parts Association (MARPA)

Mr. Tony Fazio, US Crest, Aerospace & Defense Industries Association of Europe (ASD)

Mr. Marshall Filler, Aeronautical Repair Station Association (ARSA)

Mr. Robert Glasscock, Gulfstream

Mr. Michael Gries, Rockwell Collins

Mr. John Hunter, HEICO

Mr. Jeff Lake, Duncan Aviation

Mr. Doug May, Textron Aviation

Mr. Tony Murphy, General Electric Aviation

Mr. Robert Murray, Garmin

Mr. Ric Peri, Aircraft Electronics Association (AEA)

Mr. David Silver, Aerospace Industries Association (AIA)

Ms. Christine Thompson, Boeing Commercial Airplanes

Mr. Jeffrey Williams, Astronautics Corporation of America

Mr. Chuck Wiplinger, Wipaire

Members from FAA Bargaining Units:

Mr. Greg Maund, American Federation of State, County and Municipal Employees (AFSCME)

Mr. Scott Odle, National Air Traffic Controllers Association (NATCA)

Mr. James Pratt, Professional Aviation Safety Specialists (PASS)

Members from FAA:

Ms. Colleen D'Alessandro, Aircraft Certification Service, Organizational Performance Division

Mr. Robert Duffer, Flight Standards Service, Office of Safety Standards

Mr. Jeffrey Duven, Aircraft Certification Service, System Oversight Division

Mr. Lance Gant, Aircraft Certification Service, Compliance & Airworthiness Division

Dr. Michael Romanowski, Aircraft Certification Service, Policy & Innovation Division

Mr. Amer Younossi, Aircraft Certification Service, International Division

Ms. Suzanne Chandler, Aircraft Certification Service, Enterprise Operations Division

Appendix C – FAA Comprehensive Strategic Plan for AIR Transformation

The Strategy for AIR Transformation | First Edition, July 2018

Summary of CSP Initiatives & Complementary Stakeholder Actions

First Edition, July 2018

Initiative 1. Implement clear roles and responsibilities for Industry's compliance assurance systems

A. Establish a model that prescribes AIR's *retention* of responsibilities as a function of demonstrated applicant/holder capabilities (*maturity model*)
B. Incorporate applicant/holder maturity assessments and corresponding responsibilities in working agreements with AIR
C. Establish expectations for collaboration and feedback

Complementary Stakeholder Actions

- Industry leadership prioritizes engagement in these roles, responsibilities, and practices within their organizations.
- Industry shares responsibility by proactively demonstrating commitment to safety through compliance.
- Industry establishes consistent and robust practices and systems to ensure compliance across the product lifecycle.
- Industry utilizes and expands the compliance library to build AIR's confidence in the proposed certification basis.
- Industry monitors safety performance to assess the effectiveness of risk and safety controls throughout the product lifecycle.

Initiative 2. Establish system oversight of compliance assurance systems

A. Create a system oversight model that integrates AIR's domestic and international processes.
B. Conduct system oversight.
C. **Coordinate the identification and mitigation of corrective actions between appropriate stakeholders.**

Complementary Stakeholder Actions

- Industry develops compliance assurance systems and the supporting performance monitoring programs to ensure continued airworthiness of products.
- Industry continues to demonstrate commitment to safety through compliance.
- Industry continuously matures compliance assurance practices.
- Industry and bilateral partners demonstrate accountability to commitments documented in working agreements with AIR.
- Industry and bilateral partners share safety data and collaborate on COS.

Initiative 3. Cultivate just culture

A. Formalize expectations for Industry self-correction and voluntary disclosure.
B. Monitor and improve system safety and *performance*.
C. Incorporate the Compliance Philosophy into international agreements.

Complementary Stakeholder Actions

- Industry is transparent and systematic in disclosing and correcting safety issues and noncompliances.
- Industry monitors system and safety performance to identify risks and assess the effectiveness of safety controls throughout the product lifecycle.
- Industry continuously matures their systems.

Initiative 4. Establish early engagement between AIR and stakeholders

A. Establish a process for applicant engagement with AIR well in advance of project application.
B. Create and implement a compliance library.
C. Encourage *early engagement* by *new entrants*.
D. Engage stakeholders to identify areas of innovation.
E. Develop a process to manage the risks from innovations across the product lifecycle.

Complementary Stakeholder Actions

- Industry shares knowledge about their compliance assurance systems, product lifecycle risks, and the effectiveness of safety controls.
- Industry leverages early engagement mechanisms.
- Industry uses the compliance library to conduct regulatory gap analyses and shares results with AIR.

Initiative 5. Shift toward performance-based regulations and policy where practical

A. Incorporate the principles of systems thinking in the prioritization of rulemaking and policy development.
B. Catalog opportunities to apply performance-based regulations and policy.
C. Revise regulations and policy to performance-based standards, where practical.

Complementary Stakeholder Actions

- Industry supports and advises efforts to revise Parts 21, 25, 26, 27, 29, 31, 33, 34, and 35 to performance-based regulatory frameworks where appropriate.
- Industry identifies emerging technologies and practices that can inform future needs for regulations and policy.
- Industry resources the development of consensus standards in new areas.
- Industry and AIR engage outside of projects on broad areas of innovation to build AIR knowledge and inform the evolution of regulations and policy.

Initiative 6. Actively promote partnerships among international stakeholders

A. Establish common practices among bilateral partners for assessing confidence in safety systems.
B. Engage foreign CAAs to develop globally acceptable standards, policies, and methods of compliance.
C. Enhance the oversight capabilities of foreign CAAs.
D. Maximize the recognition of bilateral partners' safety systems to reduce duplicative certification activities.
E. Promote the acceptance of safety and efficiency enhancing standards and best practices within ICAO.
F. Demonstrate commitment to FAA and AIR's international strategies and goals.

Complementary Stakeholder Actions

- Bilateral partners adhere to agreements and associated roadmaps.
- ICAO supports the issuance of coordinated and universally applicable standards and recommended practices.
- Industry collaborates with foreign CAAs, standards bodies, and ICAO to support the development and coordination of standards and practices.

Initiative 7. Implement a consistent risk analysis governance over the product lifecycle

A. Create a governance that integrates risk analyses across the product lifecycle.
B. Partner with industry in the development and application of the risk analysis governance.
C. Encourage stakeholders to voluntarily share data and analyses pertaining to safety.
D. Apply the risk analysis governance to proactively manage product and system risks.
E. Establish processes to allocate resources across the product lifecycle consistent with the risk analysis governance.

Complementary Stakeholder Actions - Industry and bilateral partners…

- align with the risk analysis governance to promote transparency and engage in meaningful dialogue with AIR.
- align with the risk analysis governance to reach decisions with an understanding of AIR decision-making criteria.
- manage risk holistically across the product lifecycle.
- voluntarily share data and support the analysis of safety risks, controls, and system performance.
- participate in the development and training of the risk analysis governance.

Initiative 8. Make relevant information accessible to decision makers.

A. Establish governance to actively manage knowledge and information.
B. Establish agile and efficient acquisition processes for information management tools.
C. Provide information management solutions that maximize efficiency and eliminate redundancy.
D. Capture knowledge continuously to enhance workforce development, succession planning and mentoring.

Complementary Stakeholder Actions

- Industry engages AIR to explore data sharing needs, requirements, and stipulations.
- Bilateral partners collaborate on global data sharing capabilities.

Initiative 9. Create a framework to enhance collaboration internally and externally

A. Incorporate the principles of systems thinking in training and policy development.
B. Identify collaboration opportunities and formalize expectations for collaboration with stakeholders, including academia.
C. Develop effective collaboration as a core workforce competency.
D. Incorporate collaboration and knowledge sharing expectations in employee performance management.
E. Establish crosscutting communities to foster mutual learning.

Complementary Stakeholder Actions

- Initiate collaboration in anticipation of needs.
- Conduct joint training with AIR and academia.

10. Empower our people with the resources necessary to effectively perform their roles

A. Develop policy, processes, and tools to support decision making at the appropriate level.
B. Develop AIR's leadership capability.
C. Institutionalize continuous feedback and After Action Reviews (AAR).
D. Create a comprehensive employee development program.
E. Refine AIR's organizational structure and processes.

Complementary Stakeholder Actions

- Industry follows the CSI process to question or dispute AIR decisions.
- Stakeholders participate in AARs after major projects.

Appendix D – Aircraft Certification Process Review and Reform (ACPRR)

August 13, 2012 - FAA Report to Congress
July 31, 2013 - FAA Detailed Implementation Plan to Congress

Summary of FAA Organizational Recommendations

Integrated Roadmap and Vision for Certification Process Reforms
The ARC recommends the FAA, with input from affected stakeholders, develop an integrated, overarching vision of the future state for certification procedures and a roadmap that clearly shows how initiatives/programs support the future state and provides gates or phases with clear milestones and success criteria.

Culture and Change Management
The ARC recommends the FAA develop and implement a comprehensive change management plan that takes full advantage of training development capability to prepare the workforce for its new and evolving roles and responsibilities in a systems safety approach to certification and oversight. The SMS principles, data analysis, evaluation of safety systems, and root cause analysis should be required training for those AIR staff overseeing safety systems.

Comprehensive Means to Implement and Measure the Effectiveness of Implementation and Benefits of Certification Process Improvements
The ARC recommends the FAA develop comprehensive implementation plans for certification process improvement initiatives that address: people (KSA; roles/responsibilities; and culture change), process, tools, training and implementation (change management) and a means to track and monitor these initiatives to ensure effectiveness of implementation, including metrics for measuring expected benefits.

Summary of FAA Certification Process Recommendations

Enhanced Use of Delegation
The ARC recommends the FAA continue to improve the effectiveness of delegation programs to achieve full utilization as a priority and realize the safety benefits of leveraging FAA resources and improved efficiency of the certification process by: implementation of the ODA action plan, appropriate training for oversight and audit of delegation programs and removing ODA programs from sequencing.

Update Part 21 to Reflect a Systems Approach for Safety
The ARC recommends the FAA undertake a review to update 14 CFR part 21 certification procedures to reflect a system safety approach to product certification processes and oversight of design organizations which includes consideration of minimum qualification and organizational requirements for design approval applicants and holders including responsibilities and privileges and implementation of the Certified Design Organization (CDO) concept.

Process Reforms and Efficiencies Needed for Other AIR Functions
The ARC recommends AIR undertake a review of COS and rulemaking processes and implement reforms necessary to improve efficiency, including—

- Increased design approval holder responsibilities for continued operational safety activities
- Strengthening the effectiveness of validation programs under bilateral agreements
- Implementing recommendations of the Rulemaking Prioritization Working Group ARAC
- Implementing recommendations of the Consistency of Regulatory Interpretation ARC
- Implementing recommendations of the Part 23 Restructuring ARC

Appendix E – Part 21 Certification & Safety Management System ARC (21ARC)

October 4, 2014 – ARC Recommendation Report to FAA

Recommendation 1) Phased Implementation of a Systems Approach to Certification
The ARC recommends a building block approach to implementing DO, which includes establishing a clear accountability framework, transitioning the FAA's oversight of design activities to a centralized systematic model, optimizing use of ODA, and implementing new organizational and SMS requirements. With successful implementation of these building blocks and voluntary DO, the ARC supports future rulemaking to consider mandatory Design Organization approval/certification.

1.a) Full Utilization of ODA & Acceptance of Enhanced Applicant Showings
The ARC recommends that the FAA issue policy and guidance to promote the understanding of the accountability framework as a basis for a systems approach to certification and facilitate voluntary approaches to implementation through FAA recognition and acceptance of applicant enhanced showings.

1.b) Minimum Applicant/Holder Qualifications & Responsibilities
The ARC recommends establishing minimum requirements for design approval applicant/holder qualification and responsibilities to ensure they fully understand the type certification process and how they intend to carry them out.

1.c) Establishment of Design Organization Requirements, Privileges and System Oversight
The ARC recommends establishing regulatory requirements for the issuance and oversight of voluntary certificated DOs, including the necessary compliance assurance, safety management, and controls to make all compliance determinations through applicant showing and verification processes. Through FAA DO certificate management oversight and direct project involvement in defined risk-based areas, the FAA may rely on the DO compliance determinations to make its finding for the issuance of a design approval. This report builds on the recommendations submitted to the FAA by the CDO ARC in 2008.

Recommendation 2) SMS Requirements for Design and Production Approval Holders- The ARC recommends establishing regulatory requirements for implementing SMS consistent with the proposed part 5 for design and production approval organizations. This new requirement should apply to organizations that design or manufacture type certificated products and those that design or manufacture articles (TSO/PMA) or make changes to products (STC) that could directly prevent continued safe flight and landing if they fail.

Recommendation 3) Evolution of FAA Oversight Toward Performance Based Systems Safety (SMS) Approaches - The ARC recommends development of a performance-based single surveillance oversight approach by a central FAA oversight organization that aligns with proposed changes to design and production organizational requirements and a systems approach to certification. The three key oversight areas are: (1) Organizational—transition from traditional show/find compliance to organizational PBO model; (2) Product and Articles—transition from the FAA's traditional role of direct project involvement to a LOPI approach focused on performing governmental functions and enhanced showing capabilities; (3) Post Certification (COS)—transition from a traditional reactionary approach to a systemic (process based) surveillance model.

Recommendation 4) Part 21 Cleanup and TSO Modernization - The ARC recommends FAA consideration of several proposed changes and updates to various part 21 regulations, which primarily reflect clarifications to eliminate confusion, modernization to reflect current practices, and updates to align with other recommendations in this report for a systems approach to certification.

Appendix F – FAA Reauthorization Act of 2018

Provisions Related to SOC-ARC Charter Objectives & Tasks (reference (H.R. 302, Pub.L. 115–254)

Provision	Description
	TITLE II—FAA SAFETY CERTIFICATION REFORM **Subtitle A—General Provisions**
Section 202 **Safety Oversight and Certification Advisory Committee**	DOT Secretary to establish Safety Oversight and Certification Advisory Committee to provide advice on policy-level issues facing the aviation community that are related to FAA safety oversight and certification programs and activities to include certification processes and efforts to streamline them, safety management systems, risk based oversight and utilization of delegation authorities. Recommendations to include consensus national goals, strategic objectives, and priorities for the most efficient, streamlined, and cost-effective certification and safety oversight processes in order to maintain the safety of the aviation system and, at the same time, allow the FAA to meet future needs and ensure that aviation stakeholders remain competitive in the global marketplace.
	Subtitle B—Aircraft Certification Reform
Section 211 **Aircraft certification performance objectives and metrics.**	In collaboration with the Advisory Committee, the FAA Administrator shall establish performance objectives and metrics for the FAA and the industry on aircraft certification. Focuses on eliminating delays, increasing accountability, improving safety and the acceptance of certification actions between FAA and bilateral partners.
Section 212 **Organization designation authorizations**	FAA Administrator shall require a procedures manual that addresses all procedures and limitations on functions to be performed by each individual ODA holder. FAA must delegate fully to the ODA holder each function permitted in the procedures manual unless safety requires limitation. Establishes a centralized ODA office to provide oversight and ensure consistency of the FAA's audit functions. Responsibility includes requiring the ODA holder to establish corrective action plans as necessary and work with them to develop capability and performance to remove limitations and facilitate full utilization of ODA.
Section 213 **ODA review**	Establishes an expert panel to assess ODA and certification program performance, including a survey, and make recommendations on whether processes and procedures function as intended, training activities for ODA and FAA oversight personnel, and best practices and improvements.
Section 214 **Type certification resolution process**	Requires FAA to establish an effective, timely, and milestone-based issue resolution process for type certification activities which provides for automatic elevation for major certification process milestones not completed or resolved within a time-period agreed to by Administrator and applicant.

Provision	Description
Section 216 **ODA staffing and oversight**	FAA report to Congress on ODA Oversight Staffing needs and risk-based tools to help ODA team members target their ODA safety activities, with the goal of ensuring full utilization of ODA.
	Subtitle C—Flight Standards Reform
Section 221 **Flight standards performance objectives and metrics**	In collaboration with the Advisory Committee, the FAA Administrator shall establish performance objectives and metrics for the FAA and the industry relating to flight standards activities. Focuses on eliminating delays, achieving full utilization of delegation, implementing risk management principles and a systems safety approach, eliminating inconsistent regulatory interpretation and improving training.
Section 222 **FAA task force on flight standards reform.**	Establishes a task force on Flight Standards Reform to identify best practices and provide recommendations with respect to streamlining regulatory processes, ensuring timely response for type certification, operational evaluation, and entry into service of newly manufactured aircraft, achieving consistent regulatory and oversight activities and FAA aviation safety inspector standards, performance and training opportunities.
Section 223 **Centralized safety guidance database**	Requires establishment of centralized safety guidance database that is publicly accessible and searchable. This includes all interpretative and guidance materials such as orders, manuals, circulars, policy statements, legal interpretation memorandums and rulemaking documents with a link to the regulatory provision to which the document relates.
Section 224 **Regulatory Consistency Communications Board**	Requires establishment of a Regulatory Consistency Communications Board that enables FAA personnel and regulated stakeholders to submit regulatory interpretation questions, including previous opinions. RCCB resolutions are to be made publicly available.
	Subtitle D—Safety Workforce
Section 231 **Safety workforce training strategy**	FAA must review and revise its safety workforce training strategy to ensure that it aligns with an effective risk-based approach to safety oversight, fosters a workforce that has the necessary oversight skills and allows such training to be completed before conducting ODA program audits.
Section 232 **Workforce review**	GAO is to conduct a review to assess the workforce and training needs of FAA Office of Aviation Safety in the anticipated budgetary environment.

Provision	Description
	Subtitle E—International Aviation
Section 241 **Promotion of United States aerospace standards, products, and services abroad**	Secretary shall promote aerospace-related safety standards abroad, facilitate and defend US approvals, utilize bilateral safety agreements to improve validation and enhance mutual acceptance, and streamline validation and coordination processes with safety authorities of foreign countries.
Section 242 **Bilateral exchanges of safety oversight responsibilities**	Facilitates acceptance of foreign airworthiness directives (AD) if country is the state-of-design for the product subject to AD, the U.S. has a bilateral aircraft certification agreement with the country, and the safety authority has an aircraft certification system with a level of safety equivalent to FAA and the issuance of the AD is an open and transparent notice and comment process. FAA may also accept alternative means of compliance approved by the safety authority.
Section 243 **FAA leadership abroad**	FAA provide a report to congress on a strategic plan to promote US safety standards, reduce redundant regulatory activity, and facilitate acceptance of FAA design and production approvals. This shall include attaining greater expertise in dispute resolution, intellectual property issues, and export control laws; establishing appropriate metrics to measure the success of bilateral aviation safety agreements; and tracking validation programs and provide assistance when there are delays.

Appendix G – Compliance Assurance Working Group Report

Compliance Assurance Report

A SOC-ARC Working Group

Contents

Project Parameters

Task

Describe what a Compliance Assurance System looks like, with maturity criteria implications.

Team

The following team members participated in the discussions and deliberations that led to the preparation of this Report:

Name	**Organization**
Bob Benjamin	Pratt & Whitney
Tom Brooks	Bell Helicopter
Jason Dickstein (Chair)	MARPA
Jeff Duven	FAA
Lance Gant	FAA
Mike Gries	Rockwell Collins
James Harris	Bell Helicopter
John Hunter	Heico
Robert Murray	Garmin
Christine Thompson	Boeing

Executive Summary

The FAA wishes to investigate a future model in which a company might implement a Compliance Assurance System that allows it to Determine Compliance within its system. If such a system was sufficiently robust, then the FAA could rely on the system as a risk mitigation, and could reflect the risk mitigation in the FAA's own decisions about oversight.

This Report details the elements of a Compliance Assurance System which could permit a company to systemically Determine Compliance. The elements include processes to support such conclusions and processes designed to ensure the System works properly, like internal auditing.

The Compliance Assurance System is analogous to the production quality system found in Part 21, Subpart G of the FAA's regulations (and is specifically analogous to 14 C.F.R. 21.137). The FAA's current production quality system regulations allow it to audit the system, and in doing so the FAA is relieved from an obligation to inspect each product and article that comes from those systems (although the FAA retains the right to inspect as necessary in support of its safety mission).

The FAA would be able to audit each Compliance Assurance System to ensure that it is functioning properly, and that it has processes that will allow it to reach acceptable conclusions. The Compliance Assurance System is meant to permit the FAA to rely on such audits as means of mitigating risk, and to permit the FAA to conclude that the results of a properly functioning system (a compliant design) will conform to the requirements of the FAA's regulations.

This sort of systems-based approach to Determining Compliance could allow the FAA to better allocate its aircraft certification resources (transitioning resources away from transactional-based review of designs, to a systems-level audit). The FAA may be able to shift aircraft certification engineering resources away from rote oversight of non-complex designs, to allow FAA engineers to focus on projects that demand a greater level of FAA attention, like those involving new technologies, those being advanced by neophyte applicants, or those that for any reason might pose higher risks.

Traditional Model

In the traditional design approval model, the applicant shows compliance ("showing") and the FAA makes a finding of compliance ("finding"). The showing is required by the current regulations. The finding is based on tests and inspections that the FAA is authorized to pursue, but is not required to pursue. The FAA therefore has discretion in the traditional model. This discretion has typically been implemented in the form of three differing levels of FAA involvement (note that the applicant's obligation remains the same in all three levels):

Traditional Model	
What Does the Applicant Do?	**What Does the Government Do?**
Applicant showing of compliance	FAA retained finding of compliance based on review of application
Applicant showing of compliance	Delegation of the finding of compliance to a designee
Applicant showing of compliance	Applicant showing, alone, is sufficient to support FAA finding of compliance

Assumptions and Discussions About a Compliance Assurance System

The Compliance Assurance Committee was asked to develop a list of elements that would make up a Compliance Assurance System. The following discussion represents a summary of some of the Committee's discussions that underlie the Committee's conclusions about a Compliance Assurance System.

Legal Authority

49 U.S.C. § 44704(e) authorizes the FAA to issue a certificate to a design organization to authorize the organization to certify compliance of products and appliances with the FAA's requirements and minimum standards. We have chosen to call this a Compliance Assurance System Certificate. When the holder of a Compliance Assurance System Certificate certifies compliance of a design that falls within the Certificate-Holder's Ratings, the FAA may rely on this certification of compliance when making FAA determinations for issue of type certificates, supplemental type certificates, production certificates and airworthiness certificates. 49 U.S.C. § 44704(e)(3).

The current legal authority for PMAs and TSOAs is derived from regulations like CAR 3.18, which were published in the airworthiness standards. E.g. *Certification Procedures for Products and Parts*, 29 FR 14562 (October 24, 1964). The FAA has no separate statutory authority for issuing PMAs and TSOAs, and the legal basis for these approvals is based in a finding of compliance with the FAA's requirements and minimum standards, so it is appropriate for the Compliance Assurance System to be applicable to the approval of PMA and TSOA, as well.

The purpose of a Compliance Assurance System is to form the systemic basis of a Compliance Assurance System Certificate. Of course, other detailed elements may be necessary in addition to the systemic elements (for example, application in a form and manner acceptable to the Administrator).

Although this report identifies the Compliance Assurance System in the form of a Compliance Assurance System Certificate, it would be possible to create a Compliance Assurance System without an FAA certificate. In order to facilitate the development of formal Compliance Assurance Systems, it may be necessary to create the FAA infrastructure for supporting formal Compliance Assurance Systems in advance of any certificate authority.

How is this Different from CDO?

Previously, an FAA Aviation Rulemaking Committee developed a Certified Design Organization (CDO) Report. A Compliance Assurance System has some similarities to the CDO concept from the CDO Report, but it is also different from the CDO Report. These similarities should not cause confusion between the CDO Report and this report.

The earlier CDO Report has been criticized for proposing a system that could be cumbersome for many smaller companies. The Committee took this into account in its deliberation and sough to strip the system down to only those elements that are necessary to a Compliance Assurance System.

Significant differences between the CDO Report concept and this Compliance Assurance System include (but are not limited to) scalability (a Compliance Assurance System is designed to be scalable), prescriptiveness (CDO was more prescriptive, and the Compliance Assurance System attempts to establish performance standards), and administrative burden (CDO included a higher administrative burden which may not have brought concurrent safety value, while the Compliance Assurance System has been tailored to minimize administrative burden to the minimum deemed appropriate to support FAA oversight of the system).

Relationship to a Safety Management System

The Committee examined several implementation models for SMS, including NAS 9927. The team agreed that NAS 9927 is a good tool for implementation of SMS; but, it appears that SMS - as a stand-alone system - is not a replacement for a Compliance Assurance System.

The Committee resolved that a Compliance Assurance System is different from a Safety Management System (SMS). An SMS is an environment in which a Compliance Assurance System may be established, but an SMS, alone, is neither sufficient nor necessary to a Compliance Assurance System.

- It is not sufficient because the team concluded that there are required elements for an effective Compliance Assurance System that do not exist in a traditional SMS. A traditional SMS, for example, does not address method of compliance.
- It is not necessary because the team concluded that an effective Compliance Assurance System could be developed and implemented without an SMS. An effective Compliance Assurance System can be implemented without the SMS element of emergency response planning, because the Compliance Assurance System is typically not authorized to suspend its processes and operate in an emergency mode.

This does not mean that there is no possible relationship between SMS and a Compliance Assurance System. An SMS may reflect an environment in which an effective Compliance Assurance System may be implemented. Where a Compliance Assurance System is implemented in an SMS environment, it is possible that the FAA may give the Compliance Assurance System Certificate applicant “credit” for the SMS environment in which it is implemented, on the grounds that the SMS provides certain risk mitigations that facilitate the operation of the Compliance Assurance System.

Relationship to Risk Assessment

The Committee considered whether to include an element about safety (or risk) assessment. The Committee decided that it was not necessary for the Compliance Assurance System to perform an independent safety assessment, because the regulations already require safety assessment as an airworthiness standard. E.g. 14 C.F.R. § 25.1309. Compliance with these safety assessment regulations is typically achieved through a process for identifying hazards, assessing risks associated with those hazards, and ensuring that such risks are appropriately mitigated. Compliance with this requirement is a compliance element to be checked by the Compliance Assurance System Person(s).

Because this design element should be checked by the Compliance Assurance System , it is not an independent element to be managed within the Compliance Assurance System Person. The Committee concluded that an independent hazard identification/risk assessment process within the Compliance Assurance System was not something necessary for the Compliance Assurance System Person to properly function.

Of course, a company with a Compliance Assurance System would be permitted to use that system to manage a hazard identification/risk assessment process that feeds compliance data back to the Compliance Assurance System in order to support the System's conclusions about compliance. This would be at the discretion of the implementer, and the choice of implementing compliance assurance in this way is likely to be related to the Compliance Assurance System Certificate Holder's choices about resource allocation.

Scope of the Compliance Assurance System

The Committee discussed the fact that companies typically "find compliance" to many different standards and requirements, ranging from customer requirements to commercial expectations like fuel consumption expectations and weight requirements. The Committee resolved that these other forms of "compliance" were outside of the scope of the Compliance Assurance System. The sole purpose of the Compliance Assurance System is to make a finding of compliance to the FAA's airworthiness standards.

This resolution led to a discussion about how the FAA could use a company's systemic approach to compliance assurance (and FAA audits of that system) to shift the risk posed by the company's designs in a way that allows the FAA to conclude that the company's compliance assurance system mitigates the risk of design-based non-compliance.

The Committee examined specific design systems, like NASA's design system, and members' own design systems, and found that they tend to encompass elements outside of our (more limited) scope because they grow to serve more than one purpose.

While it would be acceptable for a company's Compliance Assurance System to grow to address issues outside of the FAA's regulatory purview, the FAA's regulations addressing Compliance Assurance Systems should be limited only to a finding of design compliance in support of FAA's aviation safety goals.

What Does a Compliance Assurance System Look Like?

Main Pieces

The Committee originally identified three major pieces of a Compliance Assurance System:

- The procedures for finding compliance ("the system elements")
- The procedures for the company's own internal oversight of the system ("the system auditing mechanism")
- The procedures for FAA audit/oversight of the system ("the system oversight mechanism")

The first two of these three elements were described as System processes. The primary focus of the Committee, and of this Report, is limited to these System processes. The third element, procedures for FAA audit/oversight of the system, is outside of the scope of this report; FAA's oversight processes should be addressed in a separate group's analysis.

The Committee initially concluded that the system elements must define a set of processes that accomplish certain important tasks:

- Define the regulatory requirements that apply to the design being proposed;
- Validate the defined list of regulatory requirements (ensure that the list is correct and complete);
- Verify compliance to each defined/applicable regulatory requirement (ensure that the data generated shows that the design meets each identified regulatory requirement);
    - This may include validation of the anticipated methods of showing compliance;
    - This may include validation that the methods of showing compliance were used properly;
    - This may include verification of the actual compliance data.

The elements formed the core of the list of elements, and other elements were identified to support these core processes. The Committee sought to limit the elements to those deemed necessary to support the important tasks that confirm design compliance.

Benefits of a Compliance Assurance System

An additional item was identified as (a) important to real-world implementation, but (b) not intrinsically necessary to the theoretical development of the System. This was the description of the benefits received by the entity that implements and uses a formal Compliance Assurance System. Identification

of the benefits of implementation of a formal Compliance Assurance System will be necessary in order to generate interest in the development of such systems.

Prima facie, a company that implements a Compliance Assurance System may benefit from a greater level of assurance that its designs comply with the FAA's regulations; however companies may look for additional tangible benefits before investing in the development of a formal Compliance Assurance System that meets FAA requirements (or – for many companies - investing in a modification to the company's existing compliance assurance system, so that the system meets FAA expectations).

Such benefits might include FAA recognition that the Compliance Assurance System effectively mitigates risk, and that therefore the company can be trusted to approve data or even issue approvals/certificates under the Compliance Assurance System. Sample language accomplishing this can be found in Appendix A to this Report.

A concurrent benefit for both the applicant and the FAA is that the FAA can focus resources on auditing the Compliance Assurance System, and can trust the results of the Compliance Assurance System (thus meaning that the FAA can start to shift its oversight focus away from transactional-level approval of designs, and use those resources more efficiently in systems-level oversight). In this way, the Compliance Assurance System becomes analogous to a production quality system (whose elements are described under 14 C.F.R. § 21.137): in which the FAA Manufacturing Inspection District Office audits the production quality system, relies on the findings of that system, and therefore does not need to individually inspect each part released from the approved production quality system.

Allowing companies to make their Determination of Compliance within the context of a Compliance Assurance System does not necessarily alleviate the direct burdens associated with compliance – the effort necessary to successfully Determine Compliance will still need to be expended – but it should allow companies to exercise greater control over the timing of their projects through the assignment of appropriate resources to permit the Determination of Compliance. This could alleviate ancillary expenses such as unexpected project delays attributed to delays in government findings of compliance.

Integration Between Compliance Assurance and the Applicant's Design Development

One issue that was discussed by the Committee was whether the Compliance Assurance System should be integrated with an applicant's design development process, or whether it should be separate from the applicant's design development process. The Committee recognized that both models were potentially valid.

The Committee has developed the elements of a Compliance Assurance System with the intent to offer flexibility in how the Compliance Assurance System is structured, as well as scalability to meet the needs of a variety of different business models.

The Committee thinks that a more advanced Compliance Assurance System is likely to be more tightly integrated with an applicant's design development process, but this is based on the industry experience of the Committee members, rather than on a detailed examination of the pros and cons of such integration.

An FAA Implementation Mechanism

Here is a proposed outline of a program for implementing Compliance Assurance Systems.

1. Prototype the Compliance Assurance System through a pilot program that would be managed by FAA headquarters offices working cooperatively with FAA field offices
    a. Assess whether the program is truly scalable by selecting a variety of business models for the program
    b. Gather data on successes and failures. For each failure, perform a complete root cause analysis. Capture the results of these root cause analyses as a tool for improving the elements of the Compliance Assurance System
    c. Assess whether the system is sufficiently robust to meet FAA needs, and if the answer is "no" then identify specific elements that should be added to the Compliance Assurance System
    d. Identify what privileges would be appropriate to provide to those entities that successfully implement a Compliance Assurance System
    e. Test sample privilege sets by running parallel systems for comparison (e.g. one system where the company performs all compliance assessments, and is delegated the privilege of issuing its own design approvals, and a parallel FAA compliance assessment confirming the compliance assessments, and a comparison of the work of the two systems)
2. Based on pilot investigations, identify privileges that would be appropriate to offer to entities that successfully implement a Compliance Assurance System
3. Based on pilot investigations, identify how the FAA plans to manage and oversee Compliance Assurance Systems
4. Reorganize FAA to the extent necessary and develop infrastructure to permit FAA oversight (including guidance to support oversight of Compliance Assurance Systems, training for existing FAA personnel who will audit Compliance Assurance Systems, and hiring protocols for future FAA personnel who will audit Compliance Assurance Systems)
5. Initiate a voluntary program that would be open to any person who wishes to successfully implement a Compliance Assurance System; pieces of the voluntary program might include:
    A. Advisory Circular recommending practices for developing a Compliance Assurance System
    B. Order describing how to assess and approve a Compliance Assurance System
    C. Enforcement guidance for malfeasance, including administrative action parameters (amending 2150.3)
    D. Training materials for both industry and FAA personnel (a common set of materials so that FAA employees and industry personnel are all operating from the same training foundation)

E. Educational materials for foreign authorities (particularly for bilateral partners) to ensure they understand how Compliance Assurance Systems enhance safety, and also understand that FAA continues to oversee designs through a systems approach under the Compliance Assurance Systems program (and therefore foreign authorities can continue to enjoy the same level of trust in the results of the FAA's system)

6. Once enough data has been gathered from the voluntary program, the FAA should consider developing Regulatory Language to cement the Compliance Assurance System as a part of the FAA's regulatory system; such language should be influenced by the lessons learned during the pilot program and during the voluntary program

Summary: Proposed Elements of a Compliance Assurance System

The team investigated the question of "What does a company **need** to have a successful Compliance Assurance System?" The ensuing discussions led to the following list of elements which are thought to represent the core elements of a Compliance Assurance System:

(a) Each major Person of the Compliance Assurance System must be identified (hereinafter "Compliance Assurance System Persons"). A company can develop Compliance Assurance System Persons that are self-contained or these elements can intermingle with the design development. If the Compliance Assurance System Persons are NOT self-contained (e.g. the company relies on its design team to support one or more of the Compliance Assurance System Persons, or the company relies on external resources to support the Compliance Assurance System), those Persons must be identified as part of the compliance assurance system.
(b) A process for assessing and identifying Compliance Assurance System Persons, and a process for internal management of these Persons.
(c) A process for identifying the anticipated FAA level of involvement in each project. This should include a method of notification to the FAA about new projects, but only requires direct FAA engagement to the extent found in the company's FAA-acceptable system.
(d) A process for identifying each FAA airworthiness requirement that applies to the design for each project
(e) A process for validating the list of FAA airworthiness standards that applies to the design (including a process for re-validating in response to change); to ensure it is both complete and correct
(f) A process for identifying a method of compliance for each FAA airworthiness standard that applies to the design, recognizing that a single method of compliance (e.g. one test or one calculation) might be capable of demonstrating compliance to more than one standard, and some airworthiness standards might require more than one calculation or test to show compliance.

(g) For each airworthiness standard identified to be relevant to a design, a process for assessing the data that purports to show compliance, to verify that compliance is shown.

(h) A process for internal auditing of each Compliance Assurance System Person to ensure it is functioning according to the system's expectations.

(i) One or more processes for ensuring appropriate skills are represented within the Compliance Assurance System:

(1) A process for identifying the technical skills necessary for each Person who has compliance assurance responsibilities in a Compliance Assurance System, and updating that identification to reflect changing circumstances;

(2) A process for ensuring that each Person who has compliance assurance responsibilities within a Compliance Assurance System meets the identified technical skills;

(3) A process for ensuring that each Person who has compliance assurance responsibilities within a Compliance Assurance System continues to maintain an appropriate technical skill level, e.g. through testing, recurrent training, OJT, etc.

(j) A change control system to identify all design changes that arise between the time that design compliance parameters are first identified, and the time that final design compliance is found. This system should assess each design change's impact on compliance, and (where there is a possible impact on compliance) the system should either confirm compliance, or it should require revision to the compliance system protocols that apply to the project and then apply the revised protocols, as necessary.

(k) If a method of compliance library will be used, then processes for managing the method of compliance library, including amending, maintaining, reflecting new FAA policies, etc.

(l) A process for identifying records that are required to be made, and retained. The process should identify:

(1) What records need to be kept by the Holder;

(2) What records need to be transmitted by the Holder to the FAA;

(3) Who is responsible for creating the record;

(4) Who is responsible for keeping the record;

(5) What are the record retention requirements; and,

(6) How the Holder will ensure that records are made and kept in compliance with applicable regulatory requirements.

Discussion of the Elements of a Compliance Assurance System

Identification of Persons

Element

Each major Person of the Compliance Assurance System must be identified (hereinafter "Compliance Assurance System Persons"). A company can develop Compliance Assurance System Persons that are self-contained or these elements can intermingle with the design development. If the Compliance Assurance System Persons are NOT self-contained (e.g. the company relies on its design team to support one or more of the Compliance Assurance System Persons, or the company relies on external resources to support the Compliance Assurance System), those Persons must be identified as part of the compliance assurance system.

Discussion

The term "Person" is meant to have the definition found in section 1.1 of the FAA regulations. The term "Person" is used to indicate that the Compliance Assurance System should be made up of one or more entities that can be identified, for example they could be identified on an organizational chart (which is one way, but not the only way, to capture the information required by this element). There could be only one individual in a small Compliance Assurance System. Each Compliance Assurance System Persons could be an individual, or it could be an entity (such as an outside corporate entity providing Compliance Assurance support.

An element like this is needed in order to identify who exactly is involved in the process, who is authorized to make determinations and decisions reflecting compliance on behalf of the Compliance Assurance System, and who has responsibilities within the Compliance Assurance System.

The goal is to recognize company capability. In order to do that you need to have certain controls in place. You need a defined process. If the organization changes – particularly if it changes the resources assigned to the Compliance Assurance System - then the company might change in its compliance assurance capabilities (shifting to a higher or lower level of capability reflecting the available ad committed resources). The identification in this element helps to define what gives the organization the ability to find compliance.

In addition, the FAA needs to accept the Compliance Assurance System, so they need to know what they are accepting. This identification facilitates the FAA's understanding of the Compliance Assurance System that is being accepted.

Not all Compliance Assurance System Persons are equally important to the Compliance Assurance System, nor do all Compliance Assurance System Persons have the same functions in the Compliance Assurance System. Therefore, changes to Compliance Assurance System Persons may have varying

impacts on the effectiveness of the Compliance Assurance System. It is expected that individuals who are Compliance Assurance System Persons in the Compliance Assurance System might be defined in the system by titles or roles, rather than by names.

Flexibility

Every company may be different in how it structures the Compliance Assurance System Person(s). This identification element allows the FAA and the Compliance Assurance System to know what THIS particular system looks like.

In order for a system to be successful, the company needs to know who is accountable for what actions. By first identifying the Persons, the company has identified entities to which accountability may be assigned.

In order for the FAA to be able to accept a system, it also needs to understand that the Compliance Assurance System Applicant/Holder has control of the accountabilities.

A small system might be made up of a single individual. A large system might rely on individuals, departments, and even separate corporate entities to perform roles within the system.

Where segregation is intended to be a part of the Compliance Assurance System, segregation of the functions of the Compliance Assurance System may be accomplished through segregation of Persons (e.g. someone different) or though segregation of processes (which might be related to the way that the process is accomplished or the way that it is documented, even though two different functions might be accomplished by the same person). This can be important in situations where the Compliance Assurance System is made up of only one Person; it can also be important in situations where the design approval applicant's showing of compliance merges with the determination of compliance by the Compliance Assurance System.

The Committee recognized that design work may be accomplished outside the United States. The Compliance Assurance System Persons, and the system in which they operate, may need to consider this international aspect in the development of the Compliance Assurance System.

Assess, Identify and Oversee Persons

Element

A process for assessing and identifying Compliance Assurance System Persons, and a process for internal management of these Persons.

Discussion

The prior element identifies roles in the System ("who does what"). This element describes the process for assessing those who perform the roles ("how do we make sure they are right for the job"), and the process for internal management of them ("how do we make sure they do it right").

The Compliance Assurance System Persons might be individuals, entities, or even a combination of these. The System should have a method for determining what qualifications are necessary within the Compliance Assurance System Persons, and for identifying who is qualified to serve as a Compliance Assurance System Person. There needs to be a mechanism for performing oversight, which mechanism might include internal auditing, in order to ensure that the Compliance Assurance System Persons continue to maintain their qualification to perform within the system, and continue to perform properly within the system.

Committee members examine that in their own systems, they found that corporate culture played a role in this element. Many members felt that people should have "ownership" and "accountability." Many Committee members reported that their own systems for ensuring compliance included mechanisms for encouraging self-reporting, and mechanisms to facilitate self-correction of the system. This was thought of as being analogous to continuous improvement in normal quality assurance systems.

Flexibility

In a very small Compliance Assurance System, oversight of Persons may be simple; but as the Compliance Assurance System gets bigger, using more Compliance Assurance System Persons with a wider variety of distinct roles, the management process grows.

The Compliance Assurance System management process should be able to ensure that some Person in the system is accountable for each of the system's responsibilities. Traditional methods, like auditing, are *prima facie* valuable in today's world, but the regulatory language should be broad enough to facilitate new oversight models and management models in the future.

Identify FAA level of Involvement

Element

A process for identifying the anticipated FAA level of involvement in each project. This should include a method of notification to the FAA about new projects, but only requires direct FAA engagement to the extent found in the company's FAA-acceptable system.

Discussion

This element will be a systems-level discussion of how the Compliance Assurance System determines FAA level of involvement in projects. It might describe rules for determining where FAA has no project-level involvement; it might describe rules identifying where FAA retains project-level involvement; and it might be rules of engagement for identifying the FAA level of involvement in each project.

The Compliance Assurance System will need to judge the project-level risk based on the rules and guidelines found in this element. This may influence what the Compliance Assurance System's compliance privileges and obligations are on the project. The FAA involvement may depend in part on the project-level risk. If the Compliance Assurance System is assessing compliance on a project that is very much like something they do all the time, then FAA level of involvement may be much lower than FAA level of involvement in a project doing something completely novel.

In each case, it is likely that this element will explain how the Compliance Assurance System identifies projects that are subject to a lower of higher level of FAA involvement.

When the Compliance Assurance System judges the project-level risk (based on the rules found in this element), the Compliance Assurance System should recognize that there are two different types of risk in projects:

- Safety risk is the hazard to the aircraft (how important is this factor the airworthiness of the aircraft?); and,
- Compliance risk is the risk that the system will fail to determine compliance accurately (e.g. the design fails to meet FAA regulations but the system finds it compliant). This can be thought of as risk in terms of the System's ability to demonstrate compliance. For example, something that requires a great deal of skill in order to demonstrate compliance may create a compliance risk because if no one knows how to perform a complicated test then this creates an independent compliance risk.

This "Identify FAA Level of Involvement" element may need to recognize these two different types of project-level risk and treat them differently.

This element is a process for defining when the FAA is comfortable with the entity judging compliance itself. Defining when the FAA level of involvement remains higher, helps the entity to know its limits. This process helps to establish a stable and predictable mechanism for compliance. The FAA will continue to audit the process, but may not need to remain involved in project-level compliance findings within the scope of this procedure.

Flexibility

One of the goals of a Compliance Assurance System is to allow the FAA to withdraw from analyses that do not add safety value, so that it can focus its resources on the analyses for which FAA involvement remains necessary to add safety value. In companies, having clear guidelines on what the FAA expects to remain involved-in, and what the FAA no longer needs to explicitly review, and how to distinguish

between these categories, can be very useful in the smooth day-to-day operation of a Compliance Assurance System.

The scope of authority of the Compliance Assurance System, and its scalability, may be related to the FAA's level of involvement. For a less advanced Compliance Assurance System (such as a new and inexperienced System), it is possible that the FAA might accept a very broad scope of authority for the System (it can cover many subjects), but the FAA might retain a higher level of inspection and test (level of involvement) as part of its initial oversight process, and diminish this level of involvement on a planned schedule as Compliance Assurance System development milestones are reached.

The Committee expects that the Compliance Assurance System will have the ability to expand the range of subjects on which it can determine compliance and/or to continue to minimize FAA level of involvement as it gains experience and demonstrates capability.

Identify Airworthiness Requirements

Element

A process for identifying each FAA airworthiness requirement that applies to the design for each project

Discussion

Identifying FAA airworthiness requirements is a task officially performed by the FAA. But in real life projects it is already normal for the applicant to be prepared with ta list of applicable regulations when they bring a project to the FAA's attention.

Identifying the applicable FAA airworthiness requirements is an important baseline. Once compliance regulations are identified, then it becomes possible to begin thinking about how to find compliance with those regulations.

The FAA needs to know (and have control over) the way that the company is identifying the right requirements to which to find compliance.

This process may include identification of applicable regulations and it may also include identification of applicable FAA interpretation of those regulations.

The Committee discussed that the process of identification is not the end – the System also need to be able to ensure that the appropriate standards are communicated internally and also externally (such as to the FAA, to external partners, etc.) as needed.

When the applicant plans a change to a design, the applicant needs to understand how the design change modifies the compliance showing to the applicable regulations. The applicant needs to have a process for evaluating the effect of the change on the original compliance showing, in order to assess

where additional showings may be needed, or earlier showing may be invalidated by the change. For a change to a product, a material design change can represent a harder process under this element, because the applicant has to be able to assess how the change affects the determination of compliance (or must simply make a fresh Determination of Compliance if the prior determination can no longer be relied upon).

It will be important for the Compliance Assurance System to identify the application date from the applicant's application or other FAA-accepted mechanism for opening a project, which will serve as the relevant point in time for determining certification basis. If the applicant did not otherwise communicate this date to the FAA, then the Compliance Assurance System must make sure that this date is communicated to the FAA.

Flexibility

The Committee explained that a Compliance Assurance System might be able to review and approve data independent of a specific project. This could be part of a library of approved data. The approved data could then be used in subsequent projects, subject to a determination that the determination of compliance was to a regulation that is part of the subsequent project's certification basis. In such a case, following the process would require identification of the regulations (and revision levels) to which the data has been found compliant (in the absence of a specific project).

Validate the List of FAA Airworthiness Standards

Element

A process for validating the list of FAA airworthiness standards that applies to the design (including a process for re-validating in response to change); to ensure it is both complete and correct

Discussion

The prior element shows how to choose applicable requirements. This process is a check on that prior element, designed to ensure that the initial selection is correct and complete. It is necessary because an incorrect definition of the applicable regulations can either cause unnecessary work (if the list includes unnecessary regulations) or it can yield safety jeopardy if material requirements are omitted, and therefore compliance is never tested.

This is meant to be a review process. It is different from the *ab initio* selection of regulations. It can be a check list of

- what did you consider?
- What thought process did you apply?
- Understanding the thought process of the selector of the requirements helps to assess whether they approached the issue in a correct manner.

Review is not just an ad hoc approach – it must be a controlled process of reviewing to a set of criteria for evaluating the selection of requirements.

Example: Companies typically identify and validate customer requirements at the front end of the project, so that the end result will meet those requirements. In this context, you can do modeling to ensure that you design and build the right article for the customer.

Flexibility

A company with a very robust compliance library may be able to quickly and easily review a project with which it is familiar; while a new or novel project might require more scrutiny.

The Committee felt that the way that you handle review of customer requirements should serve as a model for the way that you review compliance requirements.

The Committee identified ARP 4754 rev. A as a possible guide for how to model the process, but felt that this standard was far too complex a process for an applicant performing smaller projects.

Real world implementations have shown that different people can come up with different standards – Committee members had stories about two different FAA offices disagreeing with one another about the right regulatory standard to use on a project. Thus a mere different approach might not necessarily invalidate the model being proposed for the list of regulations. This should be recognized in the airworthiness standards validation process.

Identify Methods of Compliance

Element

A process for identifying a method of compliance for each FAA airworthiness standard that applies to the design, recognizing that a single method of compliance (e.g. one test or one calculation) might be capable of demonstrating compliance to more than one standard, and some airworthiness standards might require more than one calculation or test to show compliance.

Discussion

The methods of compliance are the ways that industry proves that a design meets the requirements. Choosing methods of compliance sets the path for FAA involvement in everything, because each method of compliance is currently where FAA typically has the most involvement in today's systems.

Methods of compliance can be the most disputed element, and therefore a process for adequately identifying them helps to ensure that they are properly identified in a manner that can be justified, and that is acceptable to the FAA.

We recommend documenting that method for choosing, and the results of that choosing, to provide both clarity and auditability.

Having the process adequately documented provides the company with the ability to oversee this work and ensure it is developed consistent with the plan for supporting this work. Auditability is important, so having it tied to specific methods permits a closed loop system to verify that the company has correctly identified the methods.

Having the methods documented provides accountability of each Person because it removes the ambiguity of what success looks like. The people executing the compliance assessment will know what they are expected to do. This gives them credibility to stand behind their work.

The United States' bilateral partners have looked at the FAA system and accepted it. So this element is the way that we will articulate to other authorities how companies will demonstrate compliance in a way that is sufficiently consistent with the FAA's system to remain acceptable to bilateral partners.

Flexibility

The Committee admits that the mechanisms for identifying methods of compliance remain somewhat difficult to specifically define. Some have described methods of compliance as being like a set of books on a shelf – the applicant could pull the books off the shelf to identify known and acceptable methods of compliance. But this is merely an analogy. The actual "library" containing methods of compliance is more amorphous, and the processes for choosing methods of compliance may help identify which methods of compliance will be acceptable for the Compliance Assurance System to use.

There can be a grey area between where the applicant's showing stops and the method of compliance starts.

If you go too far in constraining the Compliance Assurance System's allowable methods then you can inhibit innovation, so it is important to allow flexibility.

An agreement between the FAA and applicant on the process for selecting a method can be useful, because it can help to resolve potential disagreements before they happen.

A system can allow variation to methods. There might be more than one way to demonstrate compliance. There might be variations to the methods that the company uses. So there needs to be a method for deviating from a previously-used method without having to run to the FAA every time you want to make a minor deviation to your methods. The FAA needs to account for the exceptions.

There might be company-specific methods that are different between two companies, but the FAA has recognized both as being sufficient.

In current practice, if an applicant can successfully make the argument that a compliance element is sufficiently similar to a compliance element from a previous project, then the FAA may let the applicant use data or showing-methods from the prior project. The final rules need a way to permit Compliance Assurance Systems to be able to do this internally, within bounds established by the FAA-approved system, when analysis shows that the prior data or method is appropriate for use in the present project.

Assess Data to Verify Conclusions

Element

For each airworthiness standard identified to be relevant to a design, a process for assessing the data that purports to show compliance, to verify that compliance is shown.

Discussion

In a traditional model, the applicant for a design approval is required to show compliance ("showing"). 14 C.F.R. §§ 21.33(b), 21.310(b). In response, the FAA is permitted to make any tests or inspections it deems necessary to find compliance ("finding"). 14 C.F.R. §§ 21.33(a), 21.310(a), 21.610.

The Compliance Assurance System modifies this traditional model, and does so within the bounds of the existing regulations. It allows the FAA to waive the need to make findings of compliance in cases where the risks of non-compliance are mitigated to such a low level that the FAA is satisfied that the applicant's substantiation alone is sufficient to provide a sufficient likelihood of compliance.

This element is analogous to the "finding" piece of the analysis that is usually performed by the FAA, or the FAA's designee, in a traditional model.

Even if we trust the process, it is normal to have checks that verify that the process is leading to a correct result. Typically, companies do not blindly trust the process. So this element formally implements the idea of checking to ensure that the method of compliance process correctly found compliance.

In the future, a person looking back at the data should be able to see how the method of compliance led to a showing of compliance.

Flexibility

The level of the checks applied to a process can vary based on complexity and likelihood of the showing being valid. So the process can accept the showing (alone) as adequate, where that is appropriate.

Relying on "showing only" is more likely in a more advanced system that has robust processes for selecting methods of compliance and performing the related tests and inspections

In a more advanced system, you will have feedback systems for self-correcting. In the most mature systems, you would have very little inspection because the system (and its auditing components) would be adequate. If you are not ever finding things in inspection, then inspection becomes obsolete and auditing becomes the controlling mechanism. Quality becomes "built-in" in the system.

Applicants need to be accountable in a system where the showing is adequate, and their auditing and feedback systems become part of that accountability.

Internal Auditing

Element

A process for internal auditing of each Compliance Assurance System Person to ensure it is functioning according to the system's expectations

Discussion

In a mature system, auditing discovers issues before those issues lead to escapes.

The culture of self-reporting can be a valuable component, here, because self-reporting should precede auditing (in a mature "safety culture," self-reports identify issues before they are discovered in an audit, so auditing can be used to find the 'hidden' issues as well as to assess corrective action).

Auditing (and self-reporting) should help to identify issues and permit mitigation of those issues before those issues lead to escapes.

The ultimate regulatory language that implements this idea may need to also encompass the elements that are typically related to auditing, such as root cause analysis and corrective action.

The risk mitigation process typically takes hazards (and potential hazards) that are identified, and subjects them to root cause analysis. The root cause analysis allows the company to identify root causes that can be corrected in order to achieve a broader and more satisfying risk-mitigation result from corrective action. Corrective action is then targeted at the root cause, to correct the identified hazards

and potential hazards in a systemic manner. Subsequent auditing is normally used to gauge the effectiveness of such corrective action.

This process results in a continuous improvement of the Compliance Assurance System.

Note that element (a) identifies roles in the System ("who does what") and element (b) describes the process for assessing those who perform the roles ("how do we make sure they are right for the job"), and the process for internal management of those persons ("how do we make sure they do it right"). This element works with those two in order to validate that their performance through auditing ("how do we confirm that everything is functioning as we expect it function").

Flexibility

It is desirable to be able to communicate system findings and systemic corrective actions across an entire system, so that in a large company a corrective action within one system can be applied where relevant to other systems that could benefit proactively from the same risk mitigation.

There are typically different levels of findings. The article/product may still be compliant, but a variation from process might nonetheless create risks that need to be mitigated. So a mature system may be looking deeper than mere regulatory compliance, and the FAA should not penalize it for looking deeper. Nor should the FAA penalize a system for failing to look beyond regulatory compliance, when its system is adequately ensuring compliance.

Personnel and Skills

Element

One or more processes for ensuring appropriate skills are represented within the Compliance Assurance System:

(1) A process for identifying the technical skills necessary for each Person who has compliance assurance responsibilities in a Compliance Assurance System, and updating that identification to reflect changing circumstances;

(2) A process for ensuring that each Person who has compliance assurance responsibilities within a Compliance Assurance System meets the identified technical skills;

(3) A process for ensuring that each Person who has compliance assurance responsibilities within a Compliance Assurance System continues to maintain an appropriate technical skill level, e.g. through testing, recurrent training, OJT, etc.

Discussion

A Compliance Assurance System Certificate Applicant needs to show the FAA how the Compliance Assurance System will select the people and entities trusted to act under the system. It is necessary to have a formal mechanism to ensure that people or entities are competent before they are entrusted with roles within the system.

The first step in this element is to identify the skills needed. The process should also show how the Compliance Assurance System will identify the skill(s) needed in order to accomplish the tasks of the Compliance Assurance System.

In aviation, businesses change. Business models can change. Their roles and responsibilities can change. Technologies can force changes. The products and articles that the business produces can changes. Also compliance technologies can change and interpretations of the regulations (and the regulations themselves) can change. These changes can infuse new risks. They can also change the facts and control systems upon which the Compliance Assurance System relies.

Industry needs to ensure that the Compliance Assurance System continues to function properly within the environment of these changes. In order to accomplish this, the skill set of the Compliance Assurance System (and its Persons) needs to evolve to meet the changing expectations and environment of the Compliance Assurance System.

The process under this element should show how the needed skills are assessed and updated so that the skill set does not remain static as the expectations and environment of the Compliance Assurance System grow and change.

In a Compliance Assurance System with more than one Compliance Assurance System Person, the total sum of the skill required by the Compliance Assurance System might be divided in to roles, and different Compliance Assurance System Persons might fulfill different roles. The first sub-element will help to facilitate the identification of the critical roles in the Compliance Assurance System. The identified skills should be assigned to the roles, so that it is clear what skills each Compliance Assurance System Person requires.

The second sub-element shows how the Compliance Assurance System will demonstrate competence of Compliance Assurance System Persons. Their competence should be judged against the required skills associated with their roles.

The third sub-element shows how the Compliance Assurance System will maintain competence of Compliance Assurance System Persons. This might be through recurrent training, periodic testing to ensure competence levels, or some combination of mechanisms. The goal is to maintain competence to the required skills associated with the Person's roles, and as those skills change (either because of a change in the roles or because of new skills deemed necessary to the Compliance Assurance System), to ensure competence in the new skills required of the Person.

Flexibility

In today's systems, it can take months to add someone to an ODA as a unit member. There is a tremendous amount of paperwork which retards this process. Industry would like to allow a Compliance Assurance System to streamline this process. Knowing what skills are needed allows a metric for assessing competence of proposed Compliance Assurance System Persons.

Also, knowing what skills are necessary for various roles helps to create a pipeline of future Compliance Assurance System Persons, because you can train them in the skills that would be necessary for them to later join as Compliance Assurance System Persons.

The processes should also define who is qualified to identify the technical skills needed. In a brand new Compliance Assurance System, associated with a brand new company and a brand new design, the person who invents an aircraft might be the only one who has relevant knowledge until additional skills are identified, and training is provided to others. This helps to illustrate, though, that skill sets can be obtained through methods other than traditional training.

In order to be more dynamic, the Compliance Assurance System may include procedures that permit the Compliance Assurance System to exercise new skills within the scope set by the FAA's assigned ratings. The process might include a process of self-evaluation and risk assessment, which would rely on objective evidence. Successful completion of this process could permit the Compliance Assurance System Certificate Holder to Determine Compliance with respect to something that it hasn't previously done in the past, but that still falls within the boundaries set by the FAA-authorized System. This might be analogous to the self-evaluation process performed by repair stations before adding a new capability to the capabilities list (except the Compliance Assurance System is identifying the necessary skills and ensuring those skills exist among the appropriate Compliance Assurance System Persons).

This process should also help the Compliance Assurance System to identify when it has a potential current or future weakness in a specific skill set area, and to make plans to support those required skill sets before losing personnel to retirement or other loss.

Change Control System

Element

A change control system to identify all design changes that arise between the time that design compliance parameters are first identified, and the time that final design compliance is found. This system should assess each design change's impact on compliance, and (where there is a possible impact on compliance) the system should either confirm compliance, or it should require revision to the compliance system protocols that apply to the project and then apply the revised protocols, as necessary.

Discussion

Project parameters can change.

The role of the Compliance Assurance System is to ensure compliance to FAA regulations. If the project parameters change in a way that affects the mechanisms for Determination of Compliance, the change control system needs to be able to identify that change and assess how it impacts the compliance determinations.

For example, the launch customer can change their requirements. These sort of changes can impact compliance. This step requires an assessment to identify whether the proposed change to the project will impacts the assessment of compliance. If it does, then it should force a modification to the system in order to properly reflect any changes that do impact compliance. Thus, the impact of project changes on the Determination of Compliance is managed within the compliance system.

In many existing companies, there are processes in place for change impact assessment whenever an engineering change is introduced into the system. This Change Control System process is analogous to the change impact assessment program, but it is limited in scope to an assessment of how the change impacts the Determination of Compliance.

Another important change that could be managed under this system arises where the Compliance Assurance System determines that the intended process for compliance need to be changed. For example, an identified method of compliance could require a test. The design might fail the test. The Compliance Assurance System may determine that the test was not the correct test. If the methods of compliance need to be changed, then this process should manage that change (Note that a compliance method failure may suggest a need for root cause and corrective action).

An open question that will need to be addressed by systems is to identify when a change is sufficiently important to warrant treatment under this element, and when it falls below the threshold for treatment under this element. The FAA will need to manage this so that the standards are uniformly implemented across the industry.

This is different from a change management system, in which changes are managed within the entity such as through flow-downs and training. Other changes to the applicant's systems are likely to be addressed under the applicant's existing change management systems. It is only the changes to the project that might invalidate or change the method of compliance that need to be checked by the Compliance Assurance System. Despite the difference, a company could choose to implement the Change Control System process of the Compliance Assurance System as one component of a larger system that manages change.

Flexibility

A company might only apply the Compliance Assurance System after the design development is substantially completed (design changes only arise before the design is submitted to the Compliance Assurance System in the business model). Similarly, when a design change happens, some companies

might separately submit each change to the Compliance Assurance System. In such a company, the idea of a design change during the activities of the Compliance Assurance System might be a foreign concept. In such a company, the Compliance Assurance System might define this element such that the Compliance Assurance System would only have to use its change control system where there was a change to the assumptions or the plan for compliance.

Management of Methods of Compliance

Element

If a method of compliance library will be used, then processes for managing the method of compliance library, including amending, maintaining, reflecting new FAA policies, etc.

Discussion

A Compliance Library is a compilation of documented methods of compliance authorized by (or published by) the FAA in any form.

The Compliance Library concept is an evolving concept. The Committee believes that a company's "compliance library" includes FAA publications and common industry practices that are used for Compliance Determinations. It may also include other tools and procedures as authorized by the FAA.

Once a tool or procedure is authorized by the FAA, it should be useable within the parameters that were authorized by the FAA.

The Compliance Assurance System need to determine on a project basis whether a compliance method found in its library is applicable to the specific intended use on the project. Therefore a compliance method might incorporate FAA-authorized assumptions.

As an example, in a galley project, the compliance library might include a method for performing pull-tests and it might have a template that is completed with the findings that need to be made in each galley project.

An authorized method of compliance might include a set of data to be acquired, a process to plug the data into, and minimum standards for what the process should yield.

The FAA may need to implement corollary mechanisms (such as their own library of authorized compliance methods to serve as an internal resource, or procedures that the FAA uses for assessing compliance methods) to ensure that compliance method authorizations are decided on a uniform and consistent basis.

Records

Element

(l) A process for identifying records that are required to be made, and retained. The process should identify:

(1) What records need to be kept by the Holder;

(2) What records need to be transmitted by the Holder to the FAA;

(3) Who is responsible for creating the record;

(4) Who is responsible for keeping the record;

(5) What are the record retention requirements; and,

(6) How the Holder will ensure that records are made and kept in compliance with applicable regulatory requirements.

Discussion

Records are likely to be necessary in order to permit the FAA to effectively audit the Compliance Assurance System.

Those records will need to follow a uniform mechanism in order to (1) standardize FAA oversight of Compliance Assurance Systems and (2) permit the FAA to obtain appropriate OMB approval of required records.

Minimum records standards should be clearly outlined, while the details of how to meet those standards should be left to the Compliance Assurance System.

Challenges, Yet to Be Addressed

These are questions that arose during discussions, and that ought to be addressed at some point, but the Committee was not able to fully address during its deliberations:

- How do we coordinate a Compliance Assurance System with an existing ODA?
- What privileges will the fully functioning Compliance Assurance System enjoy? The Committee agreed that privileges need to be clearly stated, and the specific requirements for obtaining those privileges need to be clear as well, for this program to be successful.
- When a method of compliance has been authorized by the FAA, can the data be licensed, sold, or otherwise transacted as intellectual property by the Compliance Assurance System?

- How can the FAA analyze data from a Compliance Assurance System in a risk-based FAA system that helps to determine the appropriate FAA oversight resources to assign to the Compliance Assurance System (including the interval between full audits)?
- What do the ratings (and limitations) look like? What are the industry expectations of those ratings?
- It is possible that the FAA may choose to expand the scope of a Compliance Assurance System, at the FAA's discretion (e.g. to include subsequent approvals necessary during the design's life-cycle): what standards could the FAA use in deciding to expand the scope of a System? Such standards may help the FAA in describing the scalability of the system.

Definitions and Nomenclature

"**Airworthiness Standard**" means an FAA regulation described as an airworthiness standard, such as those regulations found in Parts 23, 25, 26, 27, 29, 31, 33, 34, 35, and 36.

"**Article**" has the meaning assigned to it by 14 C.F.R. § 21.1(b)(2).

"**Determine Compliance**" is a phrase used to describe what the Compliance Assurance System Certificate Holder accomplishes, and to distinguish it from the traditional showing and finding responsibilities.

"**Person**" has the meaning assigned to it by 14 C.F.R. § 1.1.

"**Product**" has the meaning assigned to it by 14 C.F.R. § 21.1(b)(6).

Appendix A: Sample Language Implementing FAA Recognition of Compliance Assurance System Certificate

21.xxx. Compliance Assurance System Results for a Product.

For a product design that falls within the ratings of the Compliance Assurance System Certificate, If that Compliance Assurance System Certificate Holder certifies to the Administrator that:

(i) all tests and inspections identified under the [** reference to System requirements in the regulations **] have been performed; and,
(ii) the design meets the applicable regulations and minimum standards issued by the Administrator;

then the applicant may, without any further tests or inspections, obtain a type certificate from the Administrator upon the applicant's presentation of the certification required under section 21.53.

21.xxx. Compliance Assurance System Results for a PMA Article.

For any article design, that falls within the ratings of the Compliance Assurance System Certificate, except for an article intended to meet the requirements of a Technical Standard Order, If that Compliance Assurance System Certificate Holder certifies to the Administrator that:

(i) all tests and inspections identified under the [** reference to System requirements in the regulations **] have been performed; and,
(ii) the design meets the applicable regulations and minimum standards issued by the Administrator;

then the Administrator shall rely on this certification in lieu of the findings described under section 21.311 of this Chapter.

21.xxx. Compliance Assurance System Results for a TSOA Article.

For any article design, that falls within the ratings of the Compliance Assurance System Certificate, and that is intended to meet the requirements of a Technical Standard Order, If that Compliance Assurance System Certificate Holder certifies to the Administrator that

(i) all tests and inspections identified under the [** reference to System requirements in the regulations **] have been performed; and,
(ii) the design meets the applicable regulations and minimum standards issued by the Administrator;

then the Administrator shall rely on this certification in lieu of the findings described under section 21.611 of this Chapter.

Appendix H – Flight Standards Integration Working Group Report

Flight Standards Integration Working Group
Report to the SOC-ARC
Rev. 1, November 17, 2018

I. Summary of Recommendations

The Flight Standards Integration Working Group's (FSI-WG) report addresses the subject areas summarized below. High-level recommendations were discussed in the WG meetings and presented to the SOC-ARC on Sept. 14, 2018. The Federal Aviation Administration (FAA) has agreed to implement many of the industry's recommendations but has yet to develop a road map for doing so.[1]

A. **Aircraft Type Certification Program Management and Performance: Coordination, Responsibility and Accountability.** Focus areas are the regulatory requirements associated with type certification that are performed by the Aircraft Evaluation Groups (AEG) (i.e., Aircraft[2] Flight Manual (AFM), Instructions for Continued Airworthiness (ICA) and associated supplements).

The WG recommends that AIR and AFS manage and coordinate the type certification process more effectively from the beginning of a certification project, and that the role of AFS be more clearly defined in FAA guidance.

High-level recommendations include (1) integrating Aircraft Certification (AIR)-Flight Standards (AFS) program management, including appointing a single Office of Aviation Safety (AVS) program manager with full responsibility for certification project performance, 2) removing barriers that preclude the completion of AEG activity in parallel with TC activity (3) focusing FAA resources only on new/novel design features and higher-risk activities, (4) increasing the use of, and reliance on, delegation and applicant compliance assurance systems[3], (5) identifying airworthiness and operational issues early in a certification project, (6) maximizing the synergies between compliance showings and operational suitability evaluations, (7) increasing predictability and transparency, (8) developing consistent and consolidated AFS guidance relating to certification, (9) reducing late changes in certification and operational activities, (10) developing clearly defined guidance for all AEG activity, and (i) implementing performance metrics.

[1] See AFX-1 letter dated Aug. 10, 2018.
[2] For ease of reference the term Aircraft Flight Manual includes the Airplane Flight Manual and the Rotorcraft Flight Manual required by 14 CFR part 21 and the pertinent airworthiness standards.
[3] Although compliance assurance systems are not currently required, their potential use and content is being evaluated by another SOC-ARC WG.

B. **Validation Coordination.** This area focuses on obtaining design and operational approvals from Certification Management Team (CMT) authorities[4] through reciprocal acceptance or streamlined validation. High-level recommendations include (1) eliminating duplicate technical evaluations, (2) encouraging the mutual acceptance of the certificating authority's (CA) compliance determinations for AFMs, ICA, Master Minimum Equipment List (MMEL) and other operational evaluation/suitability documents, and (3) the full and expedited implementation of FAA-European Aviation Safety Agency (EASA) Technical Implementation Procedures (TIP) rev. 6.

C. **Supporting current Flight Standards integration initiatives/activities relating to entry into service (EIS) for new/amended type designs**, **aircraft delivery and customer operations.** These matters are being addressed in ongoing FAA-industry WGs, some of which were initiated prior to the formation of this WG.[5] Nevertheless, they are of high interest to the SOC ARC because they relate directly to type certification and validation coordination and are consistent with AIR Transformation objectives.

   High-level recommendations include (1) applying the accountability framework to operational evaluation documents, (2) expediting the approval of MMEL, pilot training syllabi, pilot type rating requirements, and aircraft inspection programs, (3) facilitating and streamlining letters of authorization (LOAs) for TC holder and customer pilots, and (4) streamlining the issuance of LOAs generally.

[4] The CMT authorities are ANAC of Brazil, EASA, the FAA and Transport Canada.
[5] The names and activities of some of these WGs are described later in this document.

II. Aircraft Type Certification Program Management and Performance: Coordination, Responsibility and Accountability

A. Integrated program management

1. Summary of the Issue

Type certification project management roles and responsibilities for certification plan development, approval and performance are not adequately coordinated between AIR and AFS. In particular, AEG activities are not fully integrated into the design approval process nor are their overlapping evaluations coordinated and managed consistent with other applicable requirements.

Process mapping of the roles, responsibilities, authorities and accountabilities between AIR and AFS (and within AEG) is needed to support industry understanding of these critical interfaces so timely design and associated operational approvals can be obtained.

Flight Standards AEG activities required for type certification, such as the review and acceptance of ICA and AFM/S, should be integrated into the AIR transformation roadmaps which are being developed and implemented in collaboration with industry.

2. Impact on Applicant and Customers

The absence of effective coordination between AIR and AFS leads to duplication of effort between the ACOs and AEGs. This delays the design approval process, increases costs to applicants and adversely affects aircraft delivery and entry into service.

The fact that AFS-200 and other headquarters Flight Standards divisions are responsible for establishing policy while the AEG is responsible for implementation has also caused delays on specific projects.

3. Recommendations

(a) Integrate AIR-AFS program management including the use of a single AVS program manager with full responsibility for certification project performance,
(b) Focus FAA resources only on new/novel design features and higher-risk activities,
(c) Increase the use of and reliance on delegation and applicant compliance systems,
(d) Identify airworthiness and operational issues as early as possible in certification projects,
(e) Maximize the synergies between compliance showings and operational suitability evaluations,

(f) develop consistent and consolidated AFS guidance relating to certification,
(g) reduce late changes in certification and operational activities, and
(h) remove barriers to enable FSB flight activity and F&R activity to be conducted during the same flights;
(i) develop and use performance measures

4. Expected Outcomes

(a) Improved coordination between AIR and AFS in certification-related activities,
(b) Increased predictability, transparency and consistency of process and schedule for aircraft type certification, validation, aircraft delivery and entry into service,
(c) Elimination of duplicate activities by regulatory authorities, particularly when contemplated by the applicable bilateral agreement,
(d) Early identification of issues related to airworthiness and operations, and
(e) Collection of the data that will enable the FAA and industry to monitor the effectiveness of the changes
(f) Ability to complete all AEG activity, including FSB, in parallel with and without negatively impacting the type certification schedule.

B. Aircraft Flight Manuals

1. Summary of the Issue

There is a duplication of efforts by the AEG and ACO in their review, comment, and approval of the aircraft flight manual (AFM) or associated supplement (S) prior to type certification, particularly if the Flight Standardization Board (FSB) is also in progress. On most TC and STC projects, the AEG will review the AFM(S) for operational suitability. The current policy is unclear regarding when such a review is required and what it is intended to address. The review typically happens late in the certification project due to the maturity of the manual or supplement.

Currently, there appears to be no standard other than “experience” that defines what makes an acceptable AFM(S) from an operational suitability perspective. The absence of defined criteria and/or job aid leads to inconsistent applications among the AEGs and will make future delegation of the AFM/S review function extremely difficult.

2. Impact on Applicant and Customers

The ODA scorecard shows that the AEG review of the AFM(S) is the most common reason that AFS participates in certification projects. The certification program is therefore dependent on the availability of limited AEG resources at a critical time in the project. There are many new AFM(S) or changes to AFM(S) where the AEG has little to no input, yet the review is required and can adversely impact the project’s schedule.

3. Proposed recommendation(s)

Identify the policy changes necessary to implement the following recommendations (currently an ODA CIT[6] AEG FM(S) task group item) --

(a) Define the AEG's function within the certification process with respect to the AFM/S,
(b) Determine the appropriate level of AEG's involvement, if any, using risk-based decision making and a systems safety approach (currently an ODA CIT AEG FM(S) group item)
(c) Establish an AEG job aid that defines what must be considered when reviewing the operational aspects of an AFM(S),
(d) Clarify Orders 8900.1 and 8110.4 to state that the ACO is responsible for approving the AFM/S for type certification purposes. The ACO may, however, consider operational inputs from the AEG prior to certification. During the FSB, the AEG should direct operational suitability changes to the AFM to the ACO.
(e) Improve the coordination between the ACO and AEG with respect to AFM(S) review, thereby reducing unnecessary duplication,
(f) Establish a means to effectively utilize the FAA's delegation system to perform AEG AFM/S functions, including a means to oversee those authorizations (currently an ODA CIT AEG FM(S) group item)

4. Expected Outcomes

Improved guidance and coordination between the ACO and AEG, increased predictability and transparency in AFM and ICA reviews.

C. Certification Flight Tests and Operational Suitability Evaluations (see section IV).

[6] Organization Designation Authorization Continuous Improvement Team

III. Validation Coordination

A. Summary of the Issue

The purpose and benefit of a Bilateral Aviation Safety Agreement (BASA) is to enhance the acceptance of the certificating authority's (CA) approvals and findings of compliance without any further technical review by the Validating Authority (VA), thereby maximizing reliance on the CA. Globalization of aviation business and emerging certification countries trigger growing resource demands on civil aviation authorities. The maximum use of the BASA and full recognition of the capabilities of CAs are essential to reduce the efforts required for validation.

The WG believes more should be done to accelerate the acceptance of products and services between the United States and Europe, Canada and Brazil - the other states of design with which the United States has signed BASAs. Specifically, the committee believes mutual acceptance should be accelerated for operational approvals associated with the MMEL and extended to other operational approvals. Reciprocal operational suitability approvals elements such as flight crew type rating, approved training syllabi and simulator approvals are lagging and delaying the entry into service (EIS) of newly type certificated airplanes.

B. Impact on Applicant and Customers

To date, the majority of validation activities associated with bilateral agreements have focused on a product's type certification. While some progress has been made to reduce duplicative activities, more should be done. For example, the FAA and EASA have developed processes and procedures limiting the validating or importing authority's technical involvement. Under TIP rev. 6, the FAA and EASA have agreed to mutually accept TSO/ETSOs and procedures are being developed to fully accept STCs and other design approvals. EASA has agreed to accept the vast majority of Parts Manufacturer Approvals and all repair designs without a further technical showing. This leads to faster approvals and is less burdensome to applicants. Most importantly, it maintains the exceptionally high level of safety achieved by the industry working in collaboration with the regulatory agencies.

Unfortunately, regulatory differences between bilateral partners in the area of operational approvals often delay the delivery and entry into service of aircraft. However, the majority of technical activity associated with operational approvals is very similar and should be easily accepted by the VA. The United States and Europe have recognized this and TIP rev. 6 contains a provision allowing validation of an initial or revised MMEL when approved by the CA. The TIP recognizes that validation should occur concurrently with the CA's MMEL development as far as practicable, to optimize efforts and resources of both Authorities. While discussions have taken place between FAA and EASA on this issue, little progress has been made to achieve the principal goal of validation.

In the United States, MMEL approvals are overseen by the AEGs through the Flight Operations Evaluation Boards (FOEB). Often, the MMEL is developed late in the program or in some cases, after the type certificate is issued, thereby contributing to delays in the entry into service of the affected aircraft. When approvals are developed separately or serially, a manufacturer is often faced with issuing two different manuals. This redundancy leads to no improvement in safety while creating a significant cost burden to manufacturers and ultimately leads to delivery delays for the operator.

FAA operational approvals can take anywhere from days to months after the aircraft receives its type certificate. U.S. aircraft manufacturers often have customers ready to operate the aircraft yet they cannot do so until these approvals are issued. The problem has been so severe that there have been cases where a U.S. aircraft manufacturer will receive an EASA (validated) type certificate before receiving its U.S. operational approvals for the aircraft.

The EASA has combined the operational approvals with the type certification of the aircraft. These approvals are developed by the original equipment manufacturer (OEM) which is the most knowledgeable about the aircraft's performance. FAA should explore methods to delegate more of the operational approvals to the OEM.

C. Proposed Recommendations

There should be reciprocal streamlined validation/acceptance of the AFM, Instructions for Continued Airworthiness (ICA) and operational suitability documents across CMT bilateral partners.

FAA should establish a roadmap by March 1, 2019 to meet the commitments contained in AFX-1's letter of Aug. 10, 2018, including providing regular status briefings to industry and affected bilateral partners.

D. Expected Outcomes

FAA should establish policies and procedures with its bilateral partners similar to the Maintenance Review Board (MRB) validation process it has with EASA. The FAA and EASA have agreed that the CA's approval/acceptance of an MRB or Maintenance Type Board (MTB) report shall be automatically accepted by the VA. Similar policies and procedures should be enacted as soon as possible for MMELs, flight crew training, type ratings, simulators and ICAs.

The WG recommends that immediate steps be taken to achieve the full implementation of FAA/EASA TIP rev. 6 for MMEL approvals. The following areas should be implemented quickly:

- Restart MMEL "beta test" exercises with formal agreement of working group methodologies.
- Develop basic/non-basic matrix for reciprocal validation
- Harmonize FAA Policy Letters with EASA CS-MMEL
- Consistent with the recommendation in section IV.A.3(d) of this document, amend TIP rev. 6 to eliminate paragraph 3.6.3.1(h)[7]

Eliminate duplicate activities: Since the majority of regulations and procedures are similar with each of the bilateral partners, immediate adoption of TIP rev. 6 for MMEL and future validation of other operational approvals will lead to reduction in duplicative efforts among bilateral partners. This will free up authorities' resources to focus on known safety risk areas.

Develop a collaborative harmonization roadmap leading to full transfer of responsibility of all operational suitability items to include TC/STC holders: FAA and EASA recognize that the ultimate objective under a risk-based validation approach is to achieve full acceptance by the VA, without any technical assessment or issuance of a validation approval. Both authorities have committed to a Validation Implementation Roadmap (VIR) to achieve this end. The VIR aims to accomplish this by developing and applying risk-based principles to reduce the level of technical involvement by the VA. To date, however, the operational elements necessary for entry into service have not been addressed. The committee encourages the FAA to expand the VIR to include these operational approvals.

This will result in an associated reduction of FAA and EASA certification resources while assuring a high degree of safety and promoting regulatory cooperation and harmonization between the EU and the U.S.

IV. Support for EIS of New/Amended Design Aircraft

A. MMEL (FOEB)

1. Summary of the Issue

The regulations and guidance have not kept up with advancements in technology and industry practices as it relates to conducting operations with certain equipment inoperative. Many key personnel from industry and the FAA have "tribal knowledge" of the MMEL process because they developed the methods used to perform these tasks. However, many have left the agency without documenting these practices.

Further, there is no connection between the MMEL and 14 CFR part 21. References to the MMEL and MEL are contained in the various operating rules in 14 CFR;

[7] TIP paragraph 3.6.3.1(h) provides: "The MMEL validation procedure when EASA is the CA shall allow for FAA public comment period and FAA internal coordination."

however, there is no mention of the MMEL in part 21. EASA's adoption of the OSD concept solved this problem by making the MMEL part of the aircraft's type certificate. This results in less delivery and entry into service delays because the operational suitability evaluations are coordinated with the engineering approvals.

2. Impact on Applicant and Customers

Current AEG employees are following the outdated, yet current MMEL guidance where it exists. This has a negative impact on industry.

The fact that the MMEL is not adequately grounded in part 21 contributes to entry into service delays because, as a practical matter, operators must await the MMEL's approval before the aircraft enters into revenue service.

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3. Recommendations

The WG recommends amending existing regulations and guidance to reflect "best practices" and current regulatory requirements from other aviation authorities. This includes:

(a) Issue new regulations in part 21 and the pertinent airworthiness standards making the MMEL a requirement to obtain a type or supplemental type certificate and/or make it part of the certification basis of the aircraft.[8]

[8] EASA's OSD working group has discussed separating OSD data from the issuance of the TC/STC to avoid potential program delays caused by incomplete OSD data. Manufacturers endorsed a connection between the design approval and OSD data, but also a separation which is recognized in EASA rules and guidance (i.e., 21.A.21 (f)): "By derogation from point (e), and at the request of the applicant … an aircraft type certificate may be issued before compliance with the applicable operational suitability data certification basis has been demonstrated, subject to the applicant demonstrating compliance with the operational suitability data certification basis before the operational suitability data must actually be used."

GM to 21.A.21(f), 21.A.23(b) and 21.A.103(a)4 Approval of OSD
It is acknowledged that it may not always be possible to have the operational suitability data available at the date of the issuance of the type certificate (TC), change approval or STC. The derogation provided by points 21.A.21(f), 21.A.23(b) and 21.A.103(a)4 are intended for that case. The TC, change approval or STC can be issued before compliance with the operational suitability data certification basis has been shown, provided the applicant declares the date that the OSD will be available. The OSD should be approved before the data must be used by a training organisation for the purpose of obtaining a European license, rating or attestation, or by an EU operator. This is normally at the entry into service of the first aircraft by an EU operator but could also be later for some of the elements such as the data for simulators which should only be available when a simulator has to be qualified.

However, there may be a need to make one or several OSD elements available before the entry into service, or even before the TC is issued. For example, there may be a need to start training activities before all elements contained in the OSD application can be approved.

Therefore, before the availability of a complete and fully compliant OSD, the Agency can certify partial compliance of only one or several provisional OSD elements under the TC, change approval or STC, the use of which can then be limited to specific purposes. (emphasis added)

(b) Issue guidance that describes the development, submittal, review and approval process for MMELs/MELs.
(c) Develop and conduct training of FAA and industry personnel on the new guidance
(d) Transfer ownership of the MMEL from the FAA to the TC/STC holder if required to eliminate the public comment period that occurs after the proposed MMEL has been developed. Regardless of MMEL ownership, retain industry stakeholders' opportunity to participate in the MMEL's development, the FOEB's public meetings and the availability of the FAA-approved MMEL to the public.
(e) Establish FAA delegations for organizations and individuals to review and approve MMELs and MELs on behalf of the FAA.
(f) Conform the MMEL/MEL to ICAO Annex 6 and eliminate the OpsSpecs D095 LOA.[9]
(g) Harmonize MMEL Policy Letters with EASA CS-MMEL and CS-GEN-MMEL
(h) Allow the TC/STC holder to publish Temporary Changes/Revisions to address issues found after MMEL approval.

4. Expected Outcomes

(a) Similar level of guidance as is present in the certification arena
(b) Increased predictability and consistency of requirements, process and schedule for operational evaluation activities
(c) Clarification of roles, responsibilities and interface between FAA stakeholders
(d) Increased use of and reliance on delegation and applicant compliance systems
(e) Apply accountability framework to operational evaluation documents

B. FSB Report (FSBR) and Impact on Type Rating and Air Carrier Training

1. Summary of the Issue

Note: Most of the content below was provided by members of the FSI-WG. However, the new FSB WG under the ACT ARC is just being formed and will meet in early December 2018 to begin its consideration of these issues. The information below is provided as a resource for the FSB WG.

In some cases, operational suitability flights in the FSB are duplicative of the Functional and Reliability (F&R) test flights, often conducted to the same airport, same FBO and with engines shutdown for the same amount of time. This WG recognizes that the ACO and AEG have different responsibilities when flights are conducted for the purpose of showing compliance with the airworthiness standards vs. operational suitability evaluations. However, some AEGs are more efficient at coordinating operational

[9] The FAA has briefed industry that it does not plan to eliminate the D095 LOA due to the administrative burdens it would impose on the agency and industry. Instead, the FAA plans to issue guidance to streamline the process for LOA issuance.

suitability flights with F&R test flights. Although this is consistent with current FAA policy, it is not uniformly applied.

After the FSB but prior to the issuance of the formal type rating, AEG-assigned employees give LOA check rides to OEM and training provider pilots. This allows OEM pilots to perform production test flights, completion and delivery flights. However, the number of check rides is lower than needed to support aircraft delivery and entry into service.

The current process results in manufacturers, operators, and training providers being unaware when the original type rating will be established and the pilot training process can begin This makes planning for OEM pilot training, customer training and aircraft scheduling very difficult.

It is common for AEG pilots conducting operational suitability evaluations to question whether the training syllabus provides adequate time to accomplish the training objectives. In some cases, these observations are valid. In others, they reflect the pilot's lack of proficiency in the aircraft. Consequently, when time is added to the training program to address the agencies' concerns, it is unnecessarily long.

FAA and industry recognize that FSB reports developed by different AEGs have varied in terms of content. The FAA worked internally to develop a standardized FSBR template in 2016-2017, but did not coordinate with industry to ensure the new template contains both FAA required content and material used by industry and other regulators. In response to feedback from industry in early 2018, the FAA is standing up a new working group under the ACT ARC to update the FSBR template and address a number of issues that will help facilitate the use of the report.

2. Impact on Applicant and Customers

It is difficult to plan OEM pilot training, customer pilot training and aircraft scheduling when industry does not have adequate information about when the official type rating will be established.

Duplicative F&R test flights and FSB/operational suitability flights delay aircraft delivery and entry into service.

Training programs may be modified even when not required to achieve the stated training objectives.

Manufacturers are concerned that content has been removed from the new FSBR template that is used by non-FAA entities including non-US regulators. The impact of these proposed unilateral changes by the FAA would have resulted in operators not seeing material they have relied on for previous similar models. Additionally, during the roll-out of the new FSBR template, industry experienced long delays in new and/or modified FSB reports.

The process for approving the initial report and its revisions is too long and difficult. A jointly developed FSBR template and updated processes that include consideration of FAA-versus industry ownership of the documents may help address these delays.

3. Proposed Recommendations

The FAA should consider whether LOAs or temporary certificates can be issued to customer pilots in advance of the issuance of a formal type rating.

Orders 8110.4C and 8900.1 should clearly spell out the post-FSB flow and approval processes, including specific FAA organizational responsibilities as well as expected timelines for new type ratings to be approved. The details should be specific enough that the OEMs and Part 142 training providers know which FAA offices are involved, the responsibility of each and when the type rating will be finalized. Such transparency would enable industry to better plan when the required training activities can begin.

The WG recommends that AEG/EASA Operational Suitability flights be conducted in conjunction with F&R flights to the maximum extent possible – either by having FSB/OSD members participate in the F&R flights or delegating operational suitability evaluations to the ACO test pilot.

The FSB process could be improved by soliciting feedback from the Part 142 training centers. (Note: The FAA has proposed inclusion of Part 142 training centers in the Training Standardization Board (TSB) process in draft AC 142-SCC. Industry recommends that the proposed TSB process be fully integrated into the FSB evaluation to avoid the creation of duplicative activities for the FAA, operators, and training providers.)

An amendment should be added to the FSB and OSD charters that state all members assigned to an FSB/OSD must attend a proficiency course (in the aircraft for which they are rated) not later than 30 days prior to attending the FSB/OSD. Doing so would help ensure basic airmanship skills were on a level with the customer's pilots who will receive the training.

4. Expected Outcomes

Recommendations to the FAA on both the content and process used to develop/approve FSBs, better coordination between F&R testing and operational suitability flights, improved agency guidance on the post-FSB flow and approval process, standardized content for the FSB report and increased proficiency of government pilots who approve training syllabi for use by part 142 training centers

V. Support for Aircraft Delivery and Customer Operations (Letters of Authorization)

A. Summary of the Issue

Modern transport category airplanes have a set of mostly standard communications, navigation, surveillance, and other equipment. For many aircraft, operators are required to obtain letters of authorization from the FAA to conduct operations using this equipment.

The LOA Process Improvement (LOAPI) WG has been chartered by AFS and GAMA to make recommendations that would eliminate redundant and inconsistent AFS review of aircraft airworthiness in support of operational LOAs. The working group will investigate how to better leverage FAA approvals and certification documents as part of individual operator's requests for authorization to conduct certain operations.

The group will determine the opportunities to improve the LOA process for new airplanes (i.e., current production). The group will focus on Part 91 operators in the near-term, but also determine if any of the recommended processes are applicable to Part 135 operators.

B. Impact on Applicant and Customers

Existing processes result in delays and inefficient use of resources by creating repetitive work by FAA and industry to authorize operators to conduct operations in similarly-configured aircraft.

C. Proposed Recommendations

The LOAPI WG will submit its recommendations to the FAA by the end of FY2019.

D. Expected Outcomes

The LOAPI WG hosted its first meeting on September 12-13, 2018 in Washington, D.C. The group has a one-year charter to provide recommendations to the FAA by September 30, 2019 about how to improve the process for LOA issuance and to aircraft and avionics OEMs about how to document aircraft capabilities in support of FAA processes. The group will also develop a plan for and support outreach and education as part of implementation of the recommendations.

The plan is to establish industry and FAA processes through which aircraft OEMs produce a statement of compliance/aircraft eligibility to support certain operations. The training (i.e., Part 142) participants are developing similar statements for the required pilot training and qualifications.

According to the charter, the LOAPI WG will address the following questions:

(1) How do original equipment manufacturers (OEMs) document relevant aircraft capabilities as part of type certification?
(2) How do OEMs document continued airworthiness instructions to ensure the validity of aircraft CNS capabilities?
(3) What mechanisms should operators, in coordination with the FAA, use to document aircraft compliance for new and recent production airplanes for which documentation has been accepted by the FAA as part of type certification?
(4) How do training providers document compliance with advisory circulars concerning LOAs and FSB reports?

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Appendix I – Performance Measures & Feedback Loops Working Group Report

Safety Oversight and Certification (SOC) Aviation Rulemaking Committee (ARC)

Performance Measures and Feedback Loops Task Team Report

REVISION	DATE
NEW	**12-18-2018**

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Executive Summary

After reviewing the comprehensive strategic plan, the four desired outcomes and proposed measures for the outcomes, recommendations are provided for simplifying the measures in both total number and complexity of data, implementing the most impactful measures first, and encouragement to review and implement the best practices from the ODA Scorecard and other FAA efforts underway such as performance based oversight (PBO). It is recommended the following actions be addressed.

- Monitor progress of FAA/Industry efforts to put in place elements that support safety and a Just Culture such as the increase in industry approvals of voluntary SMSs, PSPs and monitor performance of the voluntary disclosure reporting program, FAA compliance philosophy, and AD compliance

- Implement simple measures to increase the efficiency and effectiveness, specifically quality and timeliness (or flow time), of critical project tasks such as issue papers, responses to project specific certification plans, responses to compliance submittals, and finally, level of FAA involvement by project based on measured risk

- Well defined measures assist in shifting the culture and help encourage ideas to complete work in more efficient and effective ways while also showing performance to targets. These are the measures most worth putting in place.

- Consider focusing on fewer of the 10 initiatives first and monitoring progress as well as external factors such as lessons learned on 14 CFR Part 23 performance based regulations and validation roadmaps prior to taking on additional improvements.

- Measures aren't necessary to show progress for each desired outcome. The team made observations in how the desired outcomes interact and contribute to one another and how focusing on Lean principles will likely lead to a more productive AIR. That productivity could be observed in how resources are utilized on focus areas such as global leadership and validation or developing high priority regulations and policy. See the Performance Measures and Feedback Loops report for more detail.

It is a core value that any improvements undertaken must not have any impact on the compliance and safety of our system.

1 Tasking

The tasking for the Performance Measures and Feedback Loops team was as follows:

- Review the Comprehensive Strategic Plan (CSP), the proposed measures for the four (4) desired outcomes and provide feedback on the proposed measures
- Provide feedback on proposed measures, input on any additional or changed measures and offer examples of how measures could be captured and presented
- Identify any potential recommendations for the SOC ARC's consideration
- Identify next steps for the performance measures task team

1.1 Approach

Basic assumption is no action taken can negatively impact compliance or safety. Every action taken must be reviewed with this core value in mind.

Tasking was completed using the following steps.

- Review each initiative and proposed outcomes from an earlier pre-release of the CSP. Record observations.
- Review updated initiatives and brief recommendations for consideration of measures in released CSP. Record observations.
- Invited MITRE representatives to describe how the proposed measures were derived from assembling earlier inputs from teams working on some of the core principles of the Blueprint.
- Following review and observations of proposed measures, brainstormed other potential options for measures that may simplify collection and reporting.
- Using a review of the impact of proposed measures against the complexity to collect the metric, proposed a priority for consideration
- Gathered examples of ways metrics can be represented both as an aggregate across AIR as well as locally across branches

2 General Observations

While all ten proposed initiatives are well thought out and valuable, it may be more worthwhile to select fewer more impactful initiatives to start, monitor progress in those areas and use additional data to determine when might be the best time to launch additional initiatives. After reviewing and discussing the initiatives in the CSP, the performance measures task team proposed the following impact level by initiative. The higher the impact, the more progress towards the desired outcomes when taking into consideration the complexity to accomplish the task against the improvement intended.

Table 2-1 Recommended Initiative Focus for Impact

Initiative		Potential Highest Impact[1]	Rationale
1	Implement clear roles and responsibilities for Industry's compliance assurance systems	5	
2	Establish system oversight of compliance assurance systems	4	
3	Cultivate a just culture	6	
4	Establish early engagement between AIR and stakeholders	3	Innovation center and early requirements development supports earlier development of requirements before application and design.
5	Shift toward performance-based regulations and policy where practical.	Mid transformation start	Allow more time to learn lessons from 14 CFR Part 23 effort. Consider starting new or updated requirements with focus on performance based.
6	Actively promote partnerships among international stakeholders	Later effort	There are roadmaps in place or planned for several key regulatory agencies. Monitor progress.
7	Implement a consistent risk analysis governance over the product lifecycle	Later effort	Recommend utilization of existing risk based tools first.
8	Make relevant information accessible to decision makers	2	All stakeholders working from common data set easily maintained and located supports other initiatives
9	Create a framework to enhance collaboration internally and externally	Mid transformation start	
10	Empower our people with the resources necessary to effectively perform their roles	1	Empowering your team provides high value.

[1] Where a number is referenced, this initiative was determined to have high impact with opportunity to start action now.

The four desired outcomes interact in a way that may inform the FAA how to prioritize actions within the CSP when deciding which initiatives to prioritize and which measures to put in place first. The relative relationship between the desired outcomes and the initiatives, when focusing on those initiatives identified as having the highest impact can be represented by the figure below, See Figure 2-1. In order to reduce time and increase the schedule predictability of approval decisions a focus on Lean Principles is recommended. Principles such as:

- Optimize value streams by eliminating non-value added work and creating standard work to the greatest extent
- Do not create, pass along or accept defects (eliminate rework)
- Ensure work continues to flow

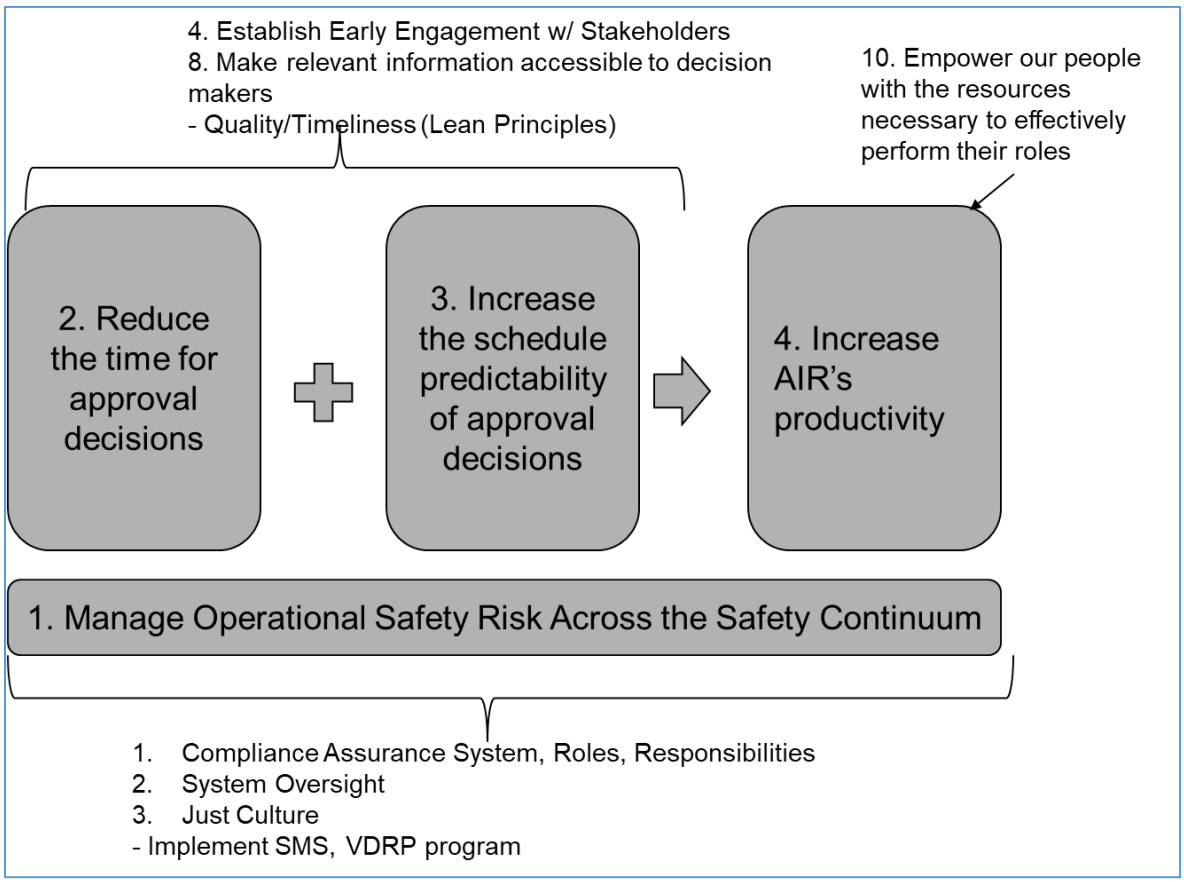

Figure 2-1.Representation of the Desired Outcomes and Most Impactful Initiatives

Throughout the team review of the initiatives and desired outcomes, a couple of additional observations are noted.

Several initiatives include many references to bilateral partners and their systems however no measures of success or what a desired outcome should be is associated specifically with these efforts.

When discussing applicant maturity, it is noted use of term maturity could be misunderstood. Consider using a more specific description, such as capability or applicant capability. A capability roadmap could be put together to define the necessary attributes of how to define capability against increased applicant privileges that would serve to reduce workload on the FAA for those applicants with a strong Just Culture and capable of showing compliance.

Significant opportunity to increase efficiency in the system seems to be available if a national target was established to significantly increase the use of e-data submittals and responses.

As measures are identified, it is important to keep in mind the measures need to be scalable from a smaller applicant with fewer projects to a larger OEM that has many projects year after year. As measures are rolled up to show overall progress, the larger applicant data if not normalized would overtake the smaller project scale applicants.

It is important to keep in mind all success measures and initiatives must stay in alignment with other goals such as encouraging industry to voluntarily implement SMS, efforts to increase visibility and utilization of PSPs, ODA Scorecard, FAA and Industry Guide to Product Certification or CPI Guide, etc. Any misalignment of these initiatives would serve to potentially disrupt the progress towards AIR's desired outcomes.

3 Measures Proposed for Comprehensive Strategic Plan (CSP) Desired Outcomes

The proposed measures for showing success for the desired outcomes under the Comprehensive Strategic Plan include: monitoring safety performance; safety confidence; and safety resource allocation.

Refer to the FAA AIR Transformation website for "Transformation Outcome Metrics" at https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/air/transformation/csp/outcomes/. That is a supplement to the CSP that describes how AIR plans to measure success in achieving the four AIR Transformation Outcomes. You will find four links, one for each of the four outcomes.

3.1 Manage Operational Safety Risk across the Safety Continuum

To see the proposed measures for showing success with this measure, refer to the information found at "Manage operational safety risk across the Safety Continuum" here: https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/air/transformation/csp/media/outcome_metrics_manage_operational_safety_risks.pdf.

The measures proposed in that document relating to this outcome are as follows:

1.1. Safety Performance: Early resolution of noncompliance and potential unsafe conditions		
1	**Transformation Outcome**	Manage operational safety risk across the Safety Continuum.
2	**What it Measures**	The ratio of corrective actions that used early and voluntary methods relative to corrective actions that required emergency or other FAA mandated action.
3	**What it Indicates**	The extent to which the system approach is resolving serious noncompliance and potential unsafe conditions early in the lifecycle of a system failure, including self-disclosure and correction. Issues left unresolved may lead to emergency or mandatory action that is inefficient and representative of unacceptable safety risk in the system.
4	**Target/Direction**	Increase in the ratio of early and voluntary corrective action relative to emergency or FAA mandated action.
5	**Calculation**	For COS, the number of SAIBs and final rule ADs after NPRM or SNPRM to the number of FRRFCs and emergency ADs. For Oversight, the number of informal and formal compliance actions relative to administrative actions.
6	**Unit of Measure**	The ratio of the number of actions relative to another type of action.
7	**Data Source**	RGL; EIS; C & E Action Tracking SharePoint
8	**Data Quality Issues**	Informal compliance actions resolved verbally may be difficult to track
9	**Reporting Frequency**	Quarterly, Annually
10	**Additional Information**	Further study of timely resolution of ADs could be analyzed by comparing the "Time Until Control Program Risk Guideline is Reached" (defined in Order 8110.107A) to the date the AD is published and the corrective actions are incorporated in the fleet. This analysis could provide a risk-based assessment of timely resolution of ADs.

Figure 3-1. Safety Performance Measure
1.1 Early resolution of noncompliance and potential unsafe conditions

1.2. Safety Confidence: Maturity level of Industry safety systems		
1	**Transformation Outcome**	Manage operational safety risk across the Safety Continuum.
2	**What it Measures**	Average level of confidence in applicant/holder systems derived from risk-based assessments, system oversight, and performance data.
3	**What it Indicates**	Confidence in Industry compliance and safety systems is a leading indicator of improved future operational safety performance. It enables AIR to focus on areas where we have less confidence.
4	**Target/Direction**	Increase in average confidence level for each sub-population.
5	**Calculation**	The distribution of confidence levels is aggregated from risk-based assessments of how well different populations of the aviation industry are assuring compliance. The confidence ratings can be represented as AIR's confidence that the organization can detect and correct any compliance or safety risk issues without complementary actions by AIR.
6	**Unit of Measure**	Non-dimensional rating on a 1 – 5 scale
7	**Data Source**	For certificate management: RBRT rating from ACAIS For certification (FAA-managed projects): RBRTa For certification (ODA-managed projects): RBRTo and ODA Scorecard
8	**Data Quality Issues**	Lack of standardization in level of rigor used in assessing company maturity.
9	**Reporting Frequency**	Annually
10	**Additional Information**	Assessments of confidence allow AIR to adjust engagements to be more value-added by complementing deficiencies in safety systems. The analysis of confidence by population will help prioritize those engagements. The populations can be further sorted by product type across the safety continuum. The metric could be aggregated as a weighted average of the populations.

Figure 3-2. Safety Confidence: Measure 1.2 Maturity level of Industry safety systems

1.3. Safety Resource Allocation: Alignment to risk		
1	**Transformation Outcome**	Manage operational safety risk across the Safety Continuum.
2	**What it Measures**	The ratio of resources allocated by AIR on high, medium and low risk activities
3	**What it Indicates**	AIR's attention shifts from companies with demonstrated performance to those with less-established safety systems; accordingly, AIR's involvement shifts from low-risk activities to high-risk safety assurance tasks.
4	**Target/Direction**	Decreased percentage of projects in which AIR is more involved than the risk indicates.
5	**Calculation**	The time spent on each type of task is tracked. Tasks are associated with a risk level based on the circumstances. The percentage of time spent on high and low risk activities can be calculated for: FAA-managed design approval projects: Percentage of projects in which FAA makes no findings of compliance (ASO) For ODA-managed TC/STC projects: Percentage of projects with FAA involvement in which ICA is listed as a reason Percentage of projects with FAA involvement in which EWIS is listed as a reason Percentage of projects with PNL requiring FAA involvement For certificate management: Percentage of companies whose RBRT risk rating is changed from level 2 to level 1.
6	**Unit of Measure**	Percentage
7	**Data Source**	RBRT rating from ACAIS; ODA Scorecard; TBD.
8	**Data Quality Issues**	Lack of standardization in level of rigor used in assessing risk
9	**Reporting Frequency**	Annually
10	**Additional Information**	The populations can be further sorted by product type across the safety continuum. Analyses should validate the methods for calculating confidence and establish a better understanding of value-added engagements across the lifecycle. This will allow AIR to focus on the highest-value-adding activities.

Figure 3-3. Safety Resource Allocation 1.3 Alignment to risk

3.1.1 Assessment of Proposed Measures

A couple of the measures are solid and will show progress however may not be as directly aligned to monitoring safety as they are to showing actions that should consistently increase overall safety and compliance in the system.

The ratio for monitoring a Just Culture of applicants self-reporting more non-compliances than the FAA is a reasonable measure and is currently included in the ODA Scorecard. Those of us on the Performance Measures task team who also participate on the ODA Scorecard Continuous Improvement Team (CIT) shared this measure has not yet been utilized to understand it's potential use and what is a positive measure. Is it the ratio of applicant to FAA findings increasing over time considered good?

The measure regarding AIR resources being utilized appropriately on high, medium and low risk tasks may be useful however specifically including that measure for this desired outcome may not make the most sense.

3.1.2 Recommendations from Task Team

Recommend both the non-compliance ratio of applicant self-reporting as compared to the FAA be kept and keep tied in with the ODA Scorecard CIT feedback. This measure supports the Just Culture initiative.

Suggest measures intended to show how the FAA is promoting safety and engaging with industry on mutual success. Targets could be set as national initiatives to set goals. These measures might include:

- Number of certificate holders with FAA-accepted voluntary SMS programs in place increasing over time
- Number of FAA and applicants with PSPs
- Number of applicants adopting VDRP increasing over time and the performance of these VDRP systems as compared to FAA oversight.
- Percentage of committed corrective actions completed on time similar to the ODA Scorecard

Another tool that could prove useful however may be more complex to implement or measure is a feedback loop of key stakeholders on how they see the Transformation actions success as compared to increasing safety. This could be accomplished via surveys, interviews, etc.

3.2 Reduce the Time for Approval Decisions

The proposed measures for showing success with this measure include: timely project approval; and interim milestone project completion time.

To see the proposed measures for showing success with this measure, refer to the information found at “Manage operational safety risk across the Safety Continuum” here:

https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/air/transformation/csp/media/outcome_metrics_approval_decisions.pdf

The measures proposed in that document relating to this outcome are as follows:

2.1. Timely Project Approval: Time from initial application submission to application approval		
1	**Transformation Outcome**	Reduce the time for approval decisions.
2	**What it Measures**	A measure of time, in calendar days, from initial submission of application date to approval date.
3	**What it Indicates**	Faster issuance of approvals due to reduced AIR involvement in the critical path, as enabled by confidence in stakeholders’ capabilities.
4	**Target/Direction**	Decrease in the average number of calendar days required to issue an approval.
5	**Calculation**	The number of calendar days between the date of initial application and the date that AIR issues an approval (i.e., approval date - application date). 19 Sub-populations of approval types will be tracked: active domestic TC programs, active foreign TCs, active domestic ATCs, active foreign ATCs, issued domestic STCs, validated foreign STCs, issued domestic ASTCs, validated foreign ASTCs, issued TSO authorizations, issued TSO LODAs and ETSOs, issued PCs, issued amended/revised PCs, issued PMAs, issued PMA supplements, issued standard C of As, issued special C of As, issued C of As for imported aircraft, issued export C of As, and issued SFAs.
6	**Unit of Measure**	Calendar days
7	**Data Source**	CPN, WTS, AWC, RGL
8	**Data Quality Issues**	Requires objective, consistent means of capturing process start and end times.
9	**Reporting Frequency**	Quarterly
10	**Additional Information**	The metric should be reported in the period in which the approval was issued. A rolling average over multiple reporting periods should be used to study long-term trends and account for projects that span multiple periods. Data for common approval types should be normalized for project complexity, company maturity and new technology.

Figure 3-4. Timely Project Approval
2.1 Time from initial application submission to application approval

2.2. Interim Milestone Completion Time: Time from initial application submission to project milestone		
1	**Transformation Outcome**	Reduce the time for approval decisions.
2	**What it Measures**	A measure of time, in calendar days, from the initial date of application submission to the date a project milestone was reached.
3	**What it Indicates**	The primary motivation for this outcome is to decrease the length of time required to issue an approval.
4	**Target/Direction**	Decrease in the average number of calendar days required to get to achieve a project milestone.
5	**Calculation**	The number of calendar days between the date of initial applications and the date a major project milestone is reached in the approval process. Milestones will depend on approval type. The following 19 approval types will be tracked: active domestic TC programs, active foreign TCs, active domestic ATCs, active foreign ATCs, issued domestic STCs, validated foreign STCs, issued domestic ASTCs, validated foreign ASTCs, issued TSO authorizations, issued TSO LODAs and ETSOs, issued PCs, issued amended/revised PCs, issued PMAs, issued PMA supplements, issued standard C of As, issued special C of As, issued C of As for imported aircraft, issued export C of As, and issued SFAs
6	**Unit of Measure**	Calendar days
7	**Data Source**	TBD
8	**Data Quality Issues**	Requires objective, consistent means of capturing process start and end times.
9	**Reporting Frequency**	Quarterly
10	**Additional Information**	Data for common approval types should be normalized for project complexity, company maturity and new technology.

Figure 3-5. Interim Milestone Completion Time
2.2 Time from initial application submission to project milestone

3.2.1 Assessment of Proposed Measures

Overall project timeline and monitoring interim milestone timeline is a check but will not highlight what is impacting the overall flow. In order to reduce the time overall, more valuable and actionable to measure critical activities or the "*big rocks*." Suggest both of these targets be eliminated as a measure of this desired outcome. Knowing the overall flow time and time spent is useful in measuring if the team is achieving an objective of becoming more efficient however it does not help drive timeliness improvement. Putting a measure in place that shows progress but doesn't help inform users of what steps to take to make improvements may not be the best approach. These targets were based upon utilization of the FAA charging system with specific task types, 19 total. When evaluating these measures it was shared this is likely a difficult system to utilize for this purpose.

3.2.2 Recommendations from Task Team

Instead of measuring overall project approval or interim step flow time, strongly recommend setting target flow times for reducing flow time of "big rocks" such as Issue Papers, TSO Deviations, PSCPs and PNL reviews, Exemptions, etc.

By measuring percentage of activities completed on target can help inform and drive culture change. Setting targets above current performance will require action plans be developed.

These types of measures require date received, date completed all of which are dates typically collected by applicants thereby making them metrics that could easily be gathered.

It is also strongly recommended that metrics be collected to measure quality of the products as a way of seeing where rework is happening and setting targets to decrease or eliminate rework. Increased rework decreases efficiency. Recording a few key reasons why something may have been returned without acceptance will help inform where to take a closer look and define actions to reduce rework by either improving definition of the artifact, creating standard work (policy or similar), where subjectivity is creating additional rework due to differences in what's expected, etc.

It is also recommended these measures be mutually collected by FAA and applicants. The selection of which measures to collect could start small, learn from early adopters of these measures and slowly increase the deployment of these measures. As actions are taken to reduce overall flow time and reduce rework the overall project timeliness will be reduced.

Recommended targets include:

- Percentage of "big rock" project milestones such as issue papers, exemptions, PSCP or PNL responses, retained compliance submittals meeting target standard flows over time and increasing first pass acceptance

- Earlier release of policy:

- Reduction of new or updated issue papers over time

    - Burn down plan for SAIL, TAIL, RAIL and SEI items over time showing how released policy is standardizing the approach for newer technical issues

    - Decreasing number of Issue Papers re-created for the same subject over time supports showing the workload reducing by stabilizing policy.

    An improvement effort is currently underway assessing changes to the Issue Paper process. The results of this initiative could be used to help implement identifying a value stream and measuring progress through the process. It is an example of empowering the people in the process to suggest and try improvements.

3.3 Increase Schedule Predictability of Approval Decisions

The proposed measures for increasing schedule predictability include: variance for product approvals based on estimated completion date; and variance for each type of product approval.

To see the proposed measures for showing success with this measure, refer to the information found at "Increase the schedule predictability of approval decisions" here:

https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/air/transformation/csp/media/outcome_metrics_schedule_predicability.pdf

The measures proposed in that document relating to this outcome are as follows:

3.1. Schedule predictability: Variance for product approvals based on estimated completion date		
1	**Transformation Outcome**	Increase the schedule predictability of approval decisions.
2	**What it Measures**	The variance between estimated completion date and actual date of approval for projects with schedule agreements.
3	**What it Indicates**	The value of collaboration and use of standard practices to reduce uncertainty and provide greater schedule predictability. Performance in terms of the actual time to approval relative to expectation.
4	**Target/Direction**	Decrease in variance over time.
5	**Calculation**	Find the average difference between estimated completion dates and actual completion dates, for all product approvals. Then, find the difference between each project from the average. Square all of the differences. Find the average of those squared differences. Sub-populations could consider CAT 1 through CAT 4 or TC, STC and minor changes could be separate sub-populations. Comparison populations could include non-early engagement, non-CPG, non-PSP or PSCP control groups.
6	**Unit of Measure**	Calendar days squared (variance)
7	**Data Source**	CPN, WTS, AWC, RGL
8	**Data Quality Issues**	Lack of standardization in how estimated completion dates are made. AIR doesn't document estimated completion date for all approval types.
9	**Reporting Frequency**	Quarterly
10	**Additional Information**	Metric should be reported in the period in which the approval was issued. A rolling average over multiple reporting periods should be used to study long-term trends and account for projects that span multiple periods. Data for common approval types should be normalized for project complexity, company maturity and new technology.

Figure 3-6. Schedule predictability 3.1 Variance for product approvals based on estimated completion date

3.2. Approval Predictability: Variance for each kind of product approval		
1	**Transformation Outcome**	Increase the schedule predictability of approval decisions.
2	**What it Measures**	A measure of schedule variance between the date of application and date of approval for similar projects, normalized by approval type, complexity, and applicant capability.
3	**What it Indicates**	A decrease in variance indicates consistency in service across AIR, and that industry is better able to rely on estimated decision times.
4	**Target/Direction**	Decrease in variance over time
5	**Calculation**	Find the average difference between application and approval dates, for all product approval times. Then, find the difference between each project from the average. Square all of the differences. Find the average of those squared differences. 19 Sub-populations of approval types will be tracked
6	**Unit of Measure**	Calendar days squared (variance)
7	**Data Source**	TBD
8	**Data Quality Issues**	Project application and approval dates are tracked manually in some cases.
9	**Reporting Frequency**	Quarterly
10	**Additional Information**	Metric should be reported in the period in which the approval was issued. A rolling average over multiple reporting periods should be used to study long-term trends and to account for projects that span multiple periods. Data for common approval types should be normalized for project complexity, company maturity and new technology.

Figure 3-7. Approval Predictability 3.2 Variance for each kind of product approval

3.3.1 Assessment of Proposed Measures

The way the proposed measures are described indicate they may be difficult to gather and don't inform those monitoring these measures what actions to take to improve. Recommend reconsidering proposed measures as currently defined to those described above in section 3.2.2.

3.3.2 Recommendations from Task Team

See recommendations in section 3.2.2, above. The timeliness and schedule predictability are interconnected.

3.4 Increase AIRs Productivity

The proposed measures related to increasing AIR's productivity include: hours per AIR approval; and hours per full time equivalent (FTE).

To see the proposed measures for showing success with this measure, refer to the information found at "Increase the schedule predictability of approval decisions" here:

https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/air/transformation/csp/media/outcome_metrics_productivity.pdf

The measures proposed in that document relating to this outcome are as follows:

4.1. Approval Productivity: Hours per AIR approval		
1	**Transformation Outcome**	Increase AIR's productivity.
2	**What it Measures**	The average number of hours to complete the entire process of issuing each kind of approval.
3	**What it Indicates**	A lower average time spent per application enables AIR to serve more design, production and airworthiness approvals with the same resources.
4	**Target/Direction**	Decrease in average time spent on an approval.
5	**Calculation**	Total number of hours allocated to an LDR project/task code(s) during a certain period divided by the number approvals associated with that project/task code(s) issued during that period. 19 Sub-populations will be tracked for these activities.
6	**Unit of Measure**	Hours per approval
7	**Data Source**	CASTLE Labor Distribution Reporting; ASTARS
8	**Data Quality Issues**	LDR hours are reported manually every two weeks and are known to be inaccurate.
9	**Reporting Frequency**	Bi-annually
10	**Additional Information**	An analysis of productivity gains informs AIR of areas that can or cannot support the growth in demand. A gain that is below the growth rate for each kind of approval request would warrant further analysis. To correct for error in counting hours worked in a reporting period for a project completed in a different reporting period, this metric should also be analyzed over longer periods and studied with the help of a rolling average.

Figure 3-8. Approval Productivity 4.1 Hours per AIR approval

4.2. Overall Productivity: Approvals issued per Full Time Equivalent		
1	**Transformation Outcome**	Increase AIR's productivity.
2	**What it Measures**	A measurement of the total number of approvals issued relative to the average number of AIR employees during a reporting period.
3	**What it Indicates**	The productivity change resulting from shifts in roles, responsibilities and activities. The metric can be used as a check against the other productivity metric – "hours per AIR approval." Because LDR hours are manually reported for that metric, tracking productivity from the perspective of staffing can help ensure accurate tracking of productivity trends over time. A greater number of approvals per AIR employee enables AIR to serve more design, production and airworthiness approvals with the same resources.
4	**Target/Direction**	Increase in the average number of approvals issued per employee.
5	**Calculation**	Total number of approvals issued during a certain period divided by the average number of AIR employees on board during that period. 19 Sub-populations will be tracked for these activities.
6	**Unit of Measure**	Approvals per employee
7	**Data Source**	FPPS; ASTARS
8	**Data Quality Issues**	Portions of this data collection process rely on manual counts.
9	**Reporting Frequency**	Bi-annually
10	**Additional Information**	A trend in total productivity will inform the allocation of resources devoted to direct engagement and in collaboration, oversight and other forms of support. This analysis will also inform adjustments to initiatives or to those engagements where overall productivity gains do not materialize. Tracking this metric with the total AIR staffing numbers is important to account for the resources expended in management, administrative support and other non-technical areas. However, analyzing this metric for only specific employee types may be important for understanding drivers of certain productivity trends.

Figure 3-9. Overall Productivity 4.2 Approvals issued per Full Time Equivalent

3.4.1 Assessment of Proposed Measures

The proposed measures utilize the FAA charging system similar to the time for approvals proposed measures, above. Measuring time per approval and as compared to approvals per FTE may be difficult and won't inform the FAA of what actions would help improve the efficiency of AIR. By taking more specific actions for desired outcomes 2 and 3, reducing the approval time and increasing the schedule predictability will result in making AIR more efficient.

3.4.2 Recommendations from Task Team

Recommend not pursuing the proposed measures taking into consideration the challenges with measuring timekeeping and because there are other simple and effective ways to show increases in AIR productivity.

In support of showing progress in AIR efficiency, monitoring improvements may perhaps be better measured through:

- Increased throughput of policy over time
- Uptake or utilization of the Innovation Center

- Monitor resource changes (total staffing) applied to policy or systems oversight, see figure below.

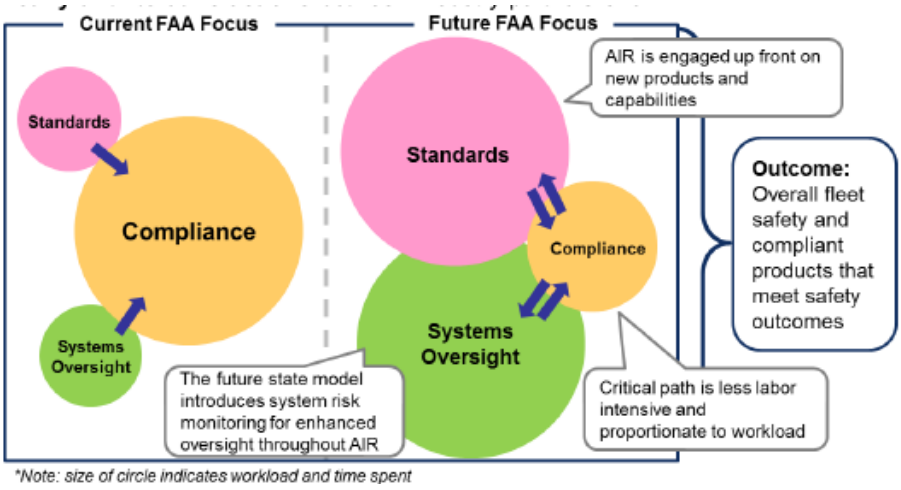

Figure 4-9. NOTIONAL REPRESENTATION of AIR Future State

3.5 Prioritizing Measures Based on Potential Impact

As mentioned earlier in Section 2 General Observations, it is important to consider starting with simple and effective measures that will have the most impact and then increasing the data collection as lessons are learned and Best Practices become available to adopt.

In addition, well defined metrics have the benefit of helping to drive change by striving for targets as well as monitor performance to those targets. Measures are best established using data that needs to be collected for other reasons.

The table, below, provides a subjective assessment based on task team discussion that sorts the measures from highest value and most simple to establish to perhaps less value and more difficult to establish. Scale is 1-5 with 1 being lowest, 5 being the highest.

Table 3-1: Proposed Measures Sorted by Highest Impact

Desired Outcome	Potential Measure	Value	Complexity
Increase the schedule predictability of approval decisions	% first pass acceptance (Quality)	5	3
Increase the schedule predictability of approval decisions	% “big rock” meeting standard flow	5	3
Increase AIR’s productivity	Increased throughput of released policy/regulations (reduce backlog)	5	3
Increase AIR’s productivity	Increased resources assigned to P&I or Systems Oversight and decreased resources assigned to Certification & Airworthiness over time	5	3

Desired Outcome	Potential Measure	Value	Complexity
Reduce the time for approval decisions	Average flow time for Issue Papers	5	4
Reduce the time for approval decisions	Average flow time for TSO Deviations	5	4
Reduce the time for approval decisions	Average flow time for Certification Plan or PNL reviews	5	4
Reduce the time for approval decisions	Average flow time for Exemptions	5	4
Manage Safety Risk	Increasing # of companies with VDRPs in place	3	1
Manage Safety Risk	Increasing on-time completion of committed corrective actions over time	4	2
Manage Safety Risk	Decrease in the # of FAA findings over time	4	2
Reduce the time for approval decisions	Decreasing FAA Level of Project Involvement (LOPI)	4	3
Manage Safety Risk	Actively solicit FAA and Industry (i.e. survey) for feedback on product safety as a result of transformation	4	4
Reduce the time for approval decisions	Reduction of new or updated issue papers over time	4	3
Manage Safety Risk	Average maturity capability level of applicants increasing over time	4	4
Manage Safety Risk	# of companies standing up a (voluntary) SMS	3	1
Manage Safety Risk	# of applicants w/ signed PSPs with their local FAA	3	1
Increase AIR's productivity	# of projects that utilized ASO	1	1
Reduce the time for approval decisions	Overall project flow time		

4 Examples of How to Create and Present Measures (Dashboard)

There are likely many ways of gathering and summarizing measures. One way is shown below.

The first figure, below, shows how to represent an overall target as well as showing how individual teams are performing to the target. This overview dashboard shows a lot of data in one view.

- Using color coded arrows provides a visible way of seeing how the group is doing overall and how each individual group is performing.
- Several measures can be included on one page showing an entire "dashboard"

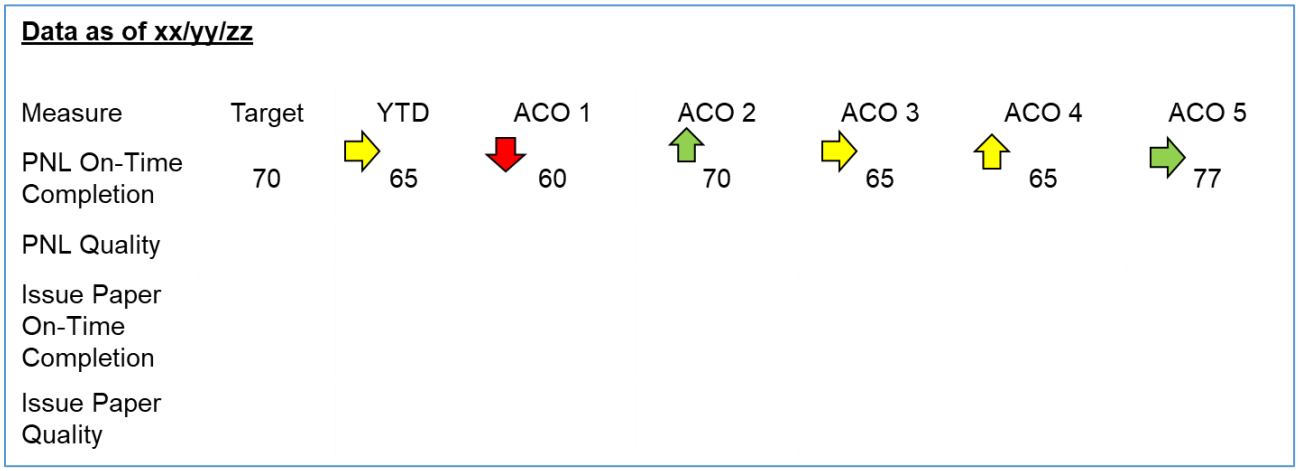

Figure 4-1 Example of Measuring Quality and Timeliness Dashboard

Each measure would have a one page summary of performance plotted over time. As an example, a chart showing quality is shown below. A lot of information can be gathered from one page including:

- Using two y-axis measures enables both a total quantity of work by month and the percent first pass acceptance tracked over time

- Using a stacked bar for each month allows the work that was completed as first pass quality and the work that did not complete with first pass quality as well as the work not yet completed (white space in stacked bar) which allows one to see the work backlog

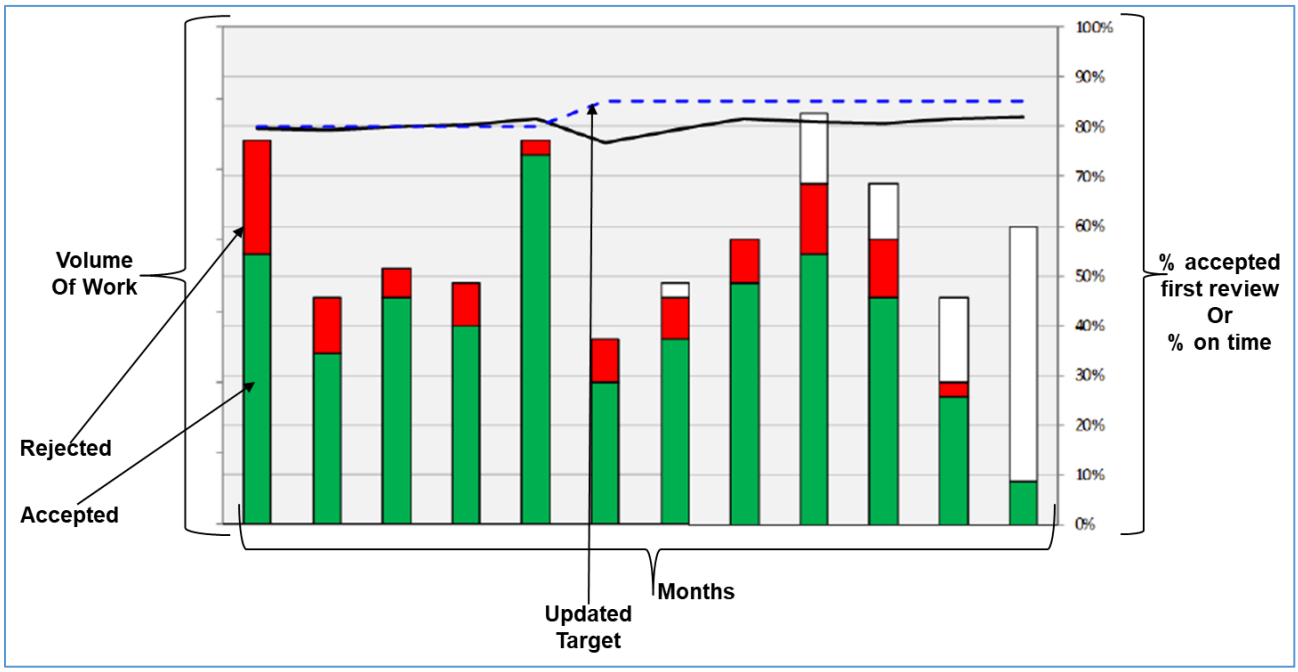

Figure 4-2 Example of Measuring Quality or Timeliness Detailed Chart

5 Potential Overall ARC Recommendations

Throughout the course of the task team activity, several recommendations were identified which are summarized below for the ARC's consideration in the final report.

- Engage industry in an ARC or other mechanism to revisit parameters and algorithms for assessment of risk in support of risk-based oversight/involvement.

- Policy to enable less complex process for utilization of designees across industry (ODA to ODA not limited to same ODA type, ODA to Individual Designee)

- Prioritize implementation of e-data submittals and responses with a national initiative to drive implementation. This effort may require first establishing clear expectations on requirements and data retention for the FAA

- Improve efficiency in TSO deviation approvals

    - Current Case: TSO deviations are often requested over and over again. Multiple companies often request the same TSO deviations.

    - Proposed Future Case: Create a central reference of previously approved TSO deviations. Allow ACOs to do "local approvals" based on that.

- Improve efficiency in STC and TC related prototype Inspections (FAA conformities)

    - Current Case: Formal FAA conformity inspections are required for test articles and test setups for Type Certificate, Supplemental Type Certificate, and Parts Manufacturer Approval qualification projects. The FAA does NOT require formal conformity inspections for test articles and test setups for TSO efforts. Some EASA TC applicants do not flow down conformity inspection requirements for qualification test articles, relying on a First Article Inspection (FAI) instead, nor for qualification test setups, relying on sufficient test documentation -- including set up pictures –instead.

    - Proposed Future Case: Allow the use of AS9102 First Article Inspection and a First Article Inspection Report (FAIR) in lieu of a test article FAA conformity inspection. Allow applicants - whose processes have shown to be capable - to rely on qualification test reports to show compliance for test setups.

6 Recommended Next Steps

The task team recommends further action to refine the observations summarized in this report.

- Adding a Certification and Airworthiness Division representative to the team to help refine the proposals regarding measuring “big rock” project tasks. Preferable adding a representative that also supported the 2017 update to the CSI Guide.

- Define “big rocks” to consider for Lean metrics for quality and flow time by identifying key interim milestones for projects. Several were identified by the task team however broader input could be beneficial

- Further evaluation of the proposed new measures through benchmarking existing examples across industry and within the FAA

- Review and confirm the metrics proposed benefits and develop a priority (schedule) for rolling out the measures

References

FAA and Industry Guide to Product Certification

ODA Scorecard Annual Report

Integrated Oversight Program

Acronyms

ACAIS	Aircraft Certification Audit Information System
CIT	Continuous Improvement Team
CPI	Continuous Process Improvement (relative to the FAA and Industry Guide to Product Certification)
CSP	Comprehensive Strategic Plan
ODA	Organizational Delegation Authorization
LOPI	Level of Project Involvement
PNL	Program Notification Letter
PSCP	Project Specific Certification Plan
RBRT	Risk Based Resource Targeting
RBRTo	Risk Based Resource Targeting for ODAs
SMS	Safety Management System
VDRP	Voluntary Disclosure Reporting Program

Appendix A Task Team Membership

Table A-1. Performance Measures Task Team Membership

Name	Organization
Abulhosn, Moin	FAA (representative for AFMCSE) Aerospace Engineer, FAA AIR-6B2 Systems and Equipment Standards Branch Policy and Innovation Division, AIR-600
Chandler, Suzanne	FAA Director Enterprise Operations Division (AIR-900)
D'Alessandro, Colleen	FAA Director Organizational Performance Division (AIR-300)
Ducharme, Eric (Paul Hill for Eric Ducharme)	General Electric
Mansfield, Lisa	FAA Deputy Enterprise Operations Division (AIR-900)
Silver, David	Aerospace Industries Association (AIA) Vice President Civil Aviation
Skelly, Brian	FAA Organizational Performance Division
Thompson, Christine (task team chair)	The Boeing Company Boeing Commercial Airplanes
Williams, Jeffrey	Astronautics
Wiplinger, Chuck	Wipaire Inc.