

A Practical Guide to Maintenance ASAP Programs



DOT/FAA/AR-09/28
An FAA Human Factors Research
and Engineering Group
Sponsored Guide

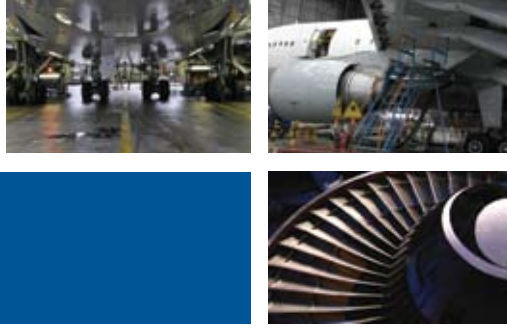


**Federal Aviation
Administration**

SEPTEMBER 2009
DOT/FAA/AR-09/28
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A Practical Guide to Maintenance ASAP Programs

This project was funded by the FAA's Human Factors Research and Engineering Group as a part of a research grant to Saint Louis University.



Foreword

The FAA developed this Maintenance Aviation Safety Action Program (ASAP) guide in response to an industry-wide desire for a simple, practical source of information regarding the development and assessment of ASAP programs across many areas of the aviation maintenance community.

Saint Louis University, in conjunction with the FAA, has collaborated with airlines and repair stations on a variety of maintenance human factors research projects – including the maintenance ASAP program. As a result, the faculty from Saint Louis University served as the logical editors and contributors for this guide. Saint Louis University and the FAA worked with active industry representatives from AAR CORP, American Airlines, JetBlue Airways, Piedmont Airlines, Southwest Airlines, and United Airlines, as well as the International Brotherhood of Teamsters and the Transportation Workers Union, to bring forward a collection of the latest practical thoughts on maintenance ASAP programs. The industry representatives brought not only depth, but also a breadth of experience to this effort.

Additionally, there are many other organizations with long-standing ASAP programs in maintenance, several with new programs, numerous with organized labor unions, some without labor unions, and other organizations currently without a formal ASAP program, that have all contributed in one way or another to this important guide. Consequently, this handbook presents key thoughts across all areas of the aviation maintenance community.

On behalf of the FAA Flight Standards Service Aircraft Maintenance Division, I would like to express my deep gratitude for the time, effort, expense, and energy to each and every contributor of this handbook. This is truly a publication for all levels of the aviation maintenance industry to embrace, developed by some of the most dedicated maintenance professionals in the business.

Sincerely,

Jay Hiles

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WHAT IS AN ASAP PROGRAM?

An Aviation Safety Action Program (ASAP) is a non-punitive error-reporting program intended to encourage reporting of errors made by employee groups so that systemic solutions could be developed and error-inducing conditions could be minimized.

In aviation maintenance, safety is dependent on technical reliability of the hardware and human reliability of the maintenance personnel. An ASAP program acknowledges the complexity of this human-machine as well as the human relationships and provides a means to address errors that impact the overall safety of aviation maintenance.

In the future, additional certificate holders, employee groups as well as FAA employees and U.S. military personnel may be included in an ASAP program.

The latest information about ASAP programs is available from the FAA's website: http://www.faa.gov/safety/programs_initiatives/aircraft_aviation/asap/policy/

Over the past several years, the number of ASAP programs has increased significantly. Additionally, ramp service personnel, air traffic controllers, and Technical Operations (FAA-Air Traffic Organization) personnel may be included.

WHY DO WE NEED AN ASAP PROGRAM IN AVIATION MAINTENANCE?



Aviation maintenance personnel need an ASAP program because of three fundamental reasons.

One, as maintenance professionals, we are obligated to improve the system. An ASAP program provides an effective mechanism to improve the maintenance system so that other maintenance professionals do not make similar mistakes.

Two, the ASAP program builds a reporting culture, allowing a non-punitive flow of information between the person who committed the error and the management who

is entrusted to implement a comprehensive, systemic solution so that others are not placed in a similar situation.

Three, maintenance errors are inherently expensive, and sometimes, they can cause catastrophic accidents. ASAP programs can help identify the conditions that led to such errors and facilitate the implementation of a comprehensive safety net, reducing the probability of a catastrophic accident.



ASAP Programs are here to stay

The International Civil Aviation Organization (ICAO) has made it mandatory for all ICAO member states to implement a Safety Management System (SMS) to minimize risk and improve aviation safety. In response to this requirement, the FAA is implementing SMS in a variety of its organizational units.

Since SMS is a regulatory requirement in Europe and Canada, it is possible that foreign governments may require U.S. carriers to implement an SMS system in order to operate flights in and out of their countries. Code sharing agreements and maintenance reciprocity agreements may also

Steps to Starting an ASAP program

- Learn more about the ASAP program: Download and read the AC 120-66B or the latest version. Read your company's Corporate Disciplinary Policy.
- Seek strongest documented commitment from senior leadership—CEO/President and VP of Maintenance.
- Consult the appropriate labor union and/or management representative to understand both perspectives.
- Consult with your FAA Principal Maintenance Inspector and the Certificate Holding District Office to understand their perspectives on ASAP.
- Consult with your company's senior leadership, particularly the Human Resources Department and General Counsel's Office to determine if there are any issues from their perspectives that need to be considered.
- Build a team of stakeholders who represent diverse interests (management, employees, and regulator) and are genuinely interested in developing an ASAP program.
- Contact the FAA Voluntary Office of Safety Programs (AFS-230) for guidance information at: http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs200/branches/afs230
- Attend, preferably as a team of stakeholders, an information sharing meeting of the Maintenance ASAP group. It is a great opportunity to meet key people in the industry and learn as well as contribute to the development of stronger ASAP programs. Meeting information can be obtained from the FAA Office of Voluntary Safety Programs.
- Use the draft MOU available on the FAA's website to develop your organization's MOU: http://www.faa.gov/safety/programs_initiatives/aircraft_aviation/asap/memo_generator/
- Once the MOU is signed by all parties, an 18-month demonstration period will start.
- After a successful review of program effectiveness during the demonstration period, the company may submit a continuing ASAP MOU for FAA acceptance. Thereafter, accepted continuing programs are subject to FAA review and renewal every two years.

influence an accelerated implementation of SMS programs within the U.S. airline industry. FAA Advisory Circular AC 120-92 provides basic guidance regarding an SMS program.

One critical part of the SMS program is safety culture improvement, and the foundation of safety culture improvement is a reporting culture, which is facilitated by non-punitive reporting of errors. In other words, an ASAP-type program supports the measurement and improvement of safety culture in an aviation organization, which in turn supports the Safety Promotion pillar of an SMS program.



WHAT ARE THE KEY CHALLENGES IN SETTING UP AN ASAP PROGRAM?

Lack of Awareness about the ASAP Program

Awareness starts with senior leadership. The President/CEO, VP of Maintenance, VP of Human Resources, VP of General Counsel, etc. should be fully supportive of an ASAP program. At the least, the VP of Maintenance [with support from the President/CEO] needs to express documented commitment to the ASAP program.

Each ASAP report leading to a systematic change is a success story because it represents employee's willingness to report an error, management's follow-through in addressing the systemic failures that led to the error, and the regula-

tor's confidence in both the employee as well as the company management. Newsletters, websites or other appropriate media should be used to communicate to all maintenance personnel how an ASAP report was effective in improving safety.

A collection of such success stories, over a period of time, will provide objective evidence of how exactly the ASAP program is changing the safety culture across the organization—procedures will improve and costs related to rework, damage, injuries, incidents, and accidents will decrease.

Labor-Management Relationship

An ASAP program is about trust and collaboration between employees, management and the regulator, toward achieving a higher goal—safety for the flying public. If there's an accident or an injury, everyone suffers. So, it is imperative that employee groups and management work together toward building the ASAP program.

Employee groups should be willing to set certain minimum standards of performance so that the ASAP program is valued as a program that respects the professionalism of maintenance personnel and does not tolerate negligent behavior. Similarly, the management should be willing to offer protection from corporate discipline when there is a clear evidence of an honest mistake. Both parties need to trust

each other as well as hold each other accountable.

If there are any employee performance issues, they need to be handled outside of the ASAP process. The information obtained from an ASAP report should not be used for disciplinary action, unless the employee has committed one of the following unacceptable behaviors:

- Criminal activity
- Substance abuse
- Use of controlled substances
- Alcohol abuse
- Intentional falsification of documents

Relationship with the Local FAA

The local FAA inspectors need to be fully aware of the ASAP program, its intent, its value, and the protection available to certificate holders under this program.

The Manager of the responsible FAA Certificate Holding District Office needs to have sufficient available maintenance

inspector resources to support participation in the ASAP program. If there are insufficient FAA personnel resources at the local level to support program participation, the FAA may be unable to approve a proposed ASAP MOU until the situation can be corrected.

Documentation to Institutionalize the Commitment toward ASAP Programs

Aviation is a documentation-driven industry, yet even some of the veteran ASAP programs may not have clear policies that govern the operation of an ASAP program. In fact, there are

three documents that, when appropriately coordinated, would aid in institutionalizing the ASAP program:

- **ASAP Memorandum of Understanding (MOU)**—establishes the basic agreement between employees, management, and the regulator. The enforcement protections of the ASAP MOU do not take effect until it is signed by the FAA Certificate Holding District Office Manager, following signatures by the other parties.
- **Corporate ASAP Policy**—establishes corporate commitment and serves as a foundational reference in the event of challenging cases. This document needs to be co-developed by the Company and Employee representatives.
- **Operating Procedures for the ASAP Program**—serves as a means to standardize the process of handling ASAP cases and may provide guidelines for decision-making. This document also serves as the anchor for procedural and professional standards in the event of turnover in the Event Review Committees. This document needs to be developed by the Event Review Committee.



SETTING-UP AN ASAP PROGRAM

A comprehensive communication plan is key to raising awareness about ASAP programs.

How do we raise the awareness regarding our ASAP program?

One of the most fundamental barriers in starting an ASAP program is the lack of awareness about it. Also, there are some misconceptions about the program. In order to address these issues, there needs to be a comprehensive communication plan—from the top management down to the hangar floor and across all the maintenance facilities, both line maintenance and base maintenance.

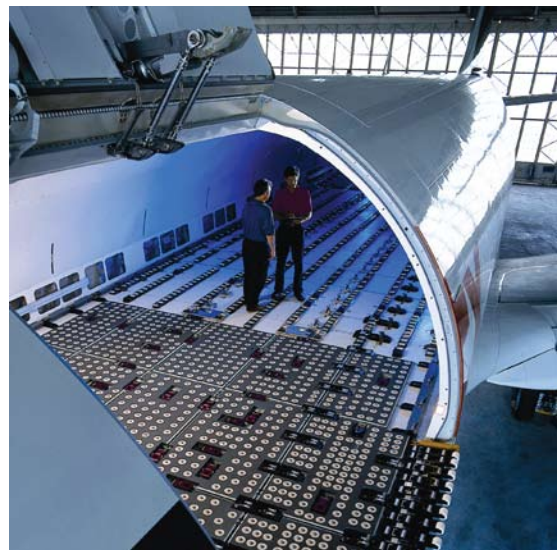
The role of senior management in communicating and practicing a strong safety message cannot be overstated. **The President/CEO of the company must truly believe in the value of an ASAP program, must visibly support the program through resources and public commitments, and must be able to make structural and procedural changes in the organization to ensure that safety is consistently valued in the organization.**

Once the President/CEO sends a clear message of commitment and starts holding the subordinate management accountable in delivering on the safety commitment, programmatic implementation will follow. Such implementation will lead to the appropriate organizational structures and processes that will uphold safety as the priority value and consequently build a more enthusiastic attitude for safety, which

in turn will result in safer behavioral practices.

Labor unions also have a pivotal role to play in raising the awareness about an ASAP program and building their members' participation in the program. Fundamentally, an ASAP program is in the best interest of the employees because it raises their professionalism.

An ASAP program should not be used by either party as a bargaining chip in a labor-management contract negotiation process because the success of an ASAP program impacts not only the company, labor union, and the individual employees, but it also impacts the broader aviation industry and the flying public.



What internal resources will we need?

There are several functions that need to be performed in order to support the ASAP program. Depending on the size and scope of the program, the number of full time employees assigned to this program will vary, but all of the following functions need to be performed by the ASAP Program Office.

ASAP Program Manager: responsible for the ASAP program and primary contact between the ASAP program and company management; responsible for tracking and following up on change recommendations.

ASAP Administrative Support: responsible for communication between the Program Manager, the Event Review Committee, management, employees, and other internal and external stakeholders.

ASAP Analyst: responsible for analyzing the ASAP reports—data collection, root cause analysis, and database maintenance.

Event Review Committee (ERC) Members: Typically, three groups need to be represented—company (management), employees (labor union or non-union), regulator (FAA). Two people from each group are required: three of them will serve as primary members and the other three will serve as the alternate members.

In addition to the above core members (which may or may not be full time appointments), the program will rely on support and contributions from several employee representatives (such as Shop Stewards) and line managers across multiple functional units (such as training, stores, quality control, etc.). Similarly, the FAA representatives serving on the ERC will also rely on support from the Certificate Holding District Office as well as from FAA Headquarters. The Maintenance ASAP Information Sharing group is always available to lend support, mentor new members, and share best practices.

In order to build a communication campaign, one has to go back to the basics: who, what, when, where, why and how.

- Who is the recipient of this message? Is it the same message for all employees as well as managers? Are there different aspects of the message that the two groups need to hear?
- What message do we want to communicate? Does it conflict with any other messages from the company or the union?
- What response or action is expected out of the recipients?
- When should this message be released? Are there any other significant communication campaigns underway? Is there a strategic advantage to releasing the message at a certain time or a key event?
- Where can the recipients get more information about the message?
- Why is this message important to the recipients? Consider how the employees are likely to react and how the first-line supervisors and mid-level managers are likely to react?
- How should this message be communicated? What means of communication are currently used (mail, e-mail, website, posters in the break room, shift briefings by foreman, company newsletters, union newsletters, notices posted near the time cards, etc.)?
- How do we plan to address the concerns of the employees and managers?
- How do we get managers to champion the message?
- How will we know to what degree the message has reached the intended audience and to what degree it has had the intended impact on the audience?





What outcomes should we expect?

Increased awareness about the Maintenance ASAP program—people know that this program exists and it is intended to improve safety through employee involvement and development of proactive, systemic solutions. This program offers protection from company discipline and from certificate action, provided the employee's report is accepted by the Event Review Committee. Informing the employee population of the safety improvements achieved through participation in ASAP is important. Newsletters or other periodic publications help show the value of the ASAP program.

Documents Institutionalizing the ASAP Program—As previously suggested, the ASAP MOU, the Corporate ASAP Policy, and the ASAP Operating Procedures will collectively institutionalize the ASAP program. Consequently, the likelihood of this program being treated as a “flavor of the month” or a management fad is very low because employees are seeing a positive change in safety practices within their organization.

Changes resulting from ASAP reports—changes in policies, procedures (including but not limited to maintenance, quality control, parts acquisition, storage and distribution, engineering authorization, etc.) and practices (moving away from undocumented or unauthorized practices).

Improvement in employee-management trust—as the type and number of changes resulting from ASAP reports are publicized, the employees as well as the managers will increase their support of the program and ultimately, the employee-management trust will improve.

Improving safety for the flying public is a natural outcome of an engaged maintenance workforce—as the ASAP program grows, more of the employees will be forthcoming about their errors and systemic failures and more of the managers will be proactive in instituting systemic solutions. Therefore, the quality of maintenance will improve and lost-time injuries, rework, and maintenance errors will decline; ultimately, the overall productivity of the workforce will improve.



CONNECTING MAINTENANCE ASAP WITH OTHER ASAP PROGRAMS

Why should we consider connecting ASAP programs?

Aviation is a networked community: flight, maintenance, dispatch, air traffic control, etc. rely on each other to ensure safe air travel. Maintenance professionals already share technical and safety data across companies (operators, manufacturers, and repair stations) because they strongly believe that such information sharing is in the best interest of the industry.

From an ASAP perspective, it is likely that pilots and mechanics might file independent reports pertaining to the same flight. Similarly, any other combination of two or more groups might file a report regarding the same flight. Also, when a Part 145 repair station and a Part 121 air carrier have independent ASAP programs, there is an opportunity for them to share data across their corporate boundaries.

When ASAP reports are handled by independent Event Review Committees and separate program managers, it is difficult to share the information obtained from multiple groups and develop a truly comprehensive solution.

So, if there's a chance that an ASAP report may have been filed by another employee group, it would be a good idea for the program managers of those groups to connect with each other and strive to develop a more comprehensive solution.

The Aviation Safety Information Analysis and Sharing (ASIAS) program is intended to collect de-identified aviation safety information from a variety of data sources, integrate it, and analyze it to identify industry-wide issues, trends, and priorities for safety interventions—all in a proactive manner. For more information on this program, visit <http://www.asias.faa.gov>

An ASAP Leadership Alliance has been formed in the aviation industry to serve as a team that will help build new ASAP programs, support and counsel struggling ASAP programs, and advocate the benefits of ASAP programs to the industry, general public, as well as the FAA. For more information, contact the Director of Safety at Air Transport Association.

How do we go about connecting the ASAP programs?

The connection of the ASAP programs could be achieved through any of the following means or a combination of means:

- Have one program office that handles all ASAP programs
- Have a formal structure that requires certain level of information sharing and collaboration among multiple program managers
- Encourage informal information sharing among program managers
- Host joint information sharing meetings within the company
- Participate in joint information sharing meetings across the industry
- Participate in the ASIAs program:
Contact the Office of Aviation Safety Analytical Services at <http://www.asias.faa.gov>



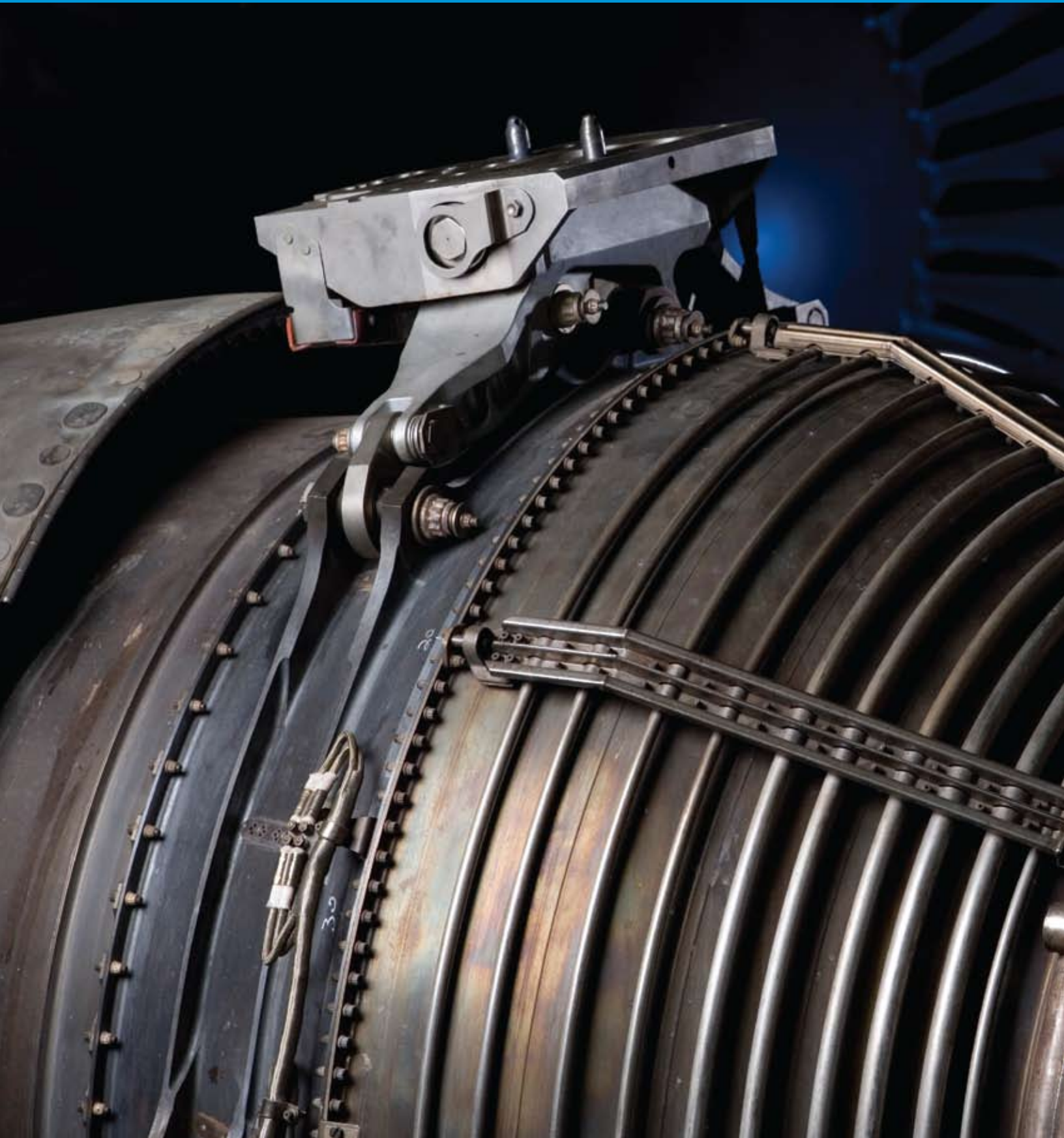
How do we get action on prioritized issues across the industry?



The aviation industry has a long history of collaboration across the various industry segments to identify and resolve system-wide safety issues. The Maintenance ASAP program is another means of building the collaboration with the specific purpose of identifying top priority safety issues in maintenance.

The Maintenance ASAP Information Sharing group is working together and developing these priorities. As the priorities are identified, appropriate research and intervention efforts are launched.

MEASURING



SUCCESS

A man wearing safety glasses and a dark t-shirt is focused on working on a large, complex aircraft engine. He is using a tool to adjust a component on the engine's fan section. The background is dark and industrial, with various pipes and engine parts visible.

The ASAP program is at the heart of safety culture: in order to build a strong safety culture, the organization needs to have structures, policies, procedures, and practices in place that support the desired behaviors from the employees and managers. The ASAP program enables reporting of errors made by a member of the participating employee group without fear of reprisal from the management or from the regulator. Such a behavioral shift is consistent with the higher level of professionalism expected in an organization with a strong safety culture. Further, measurement and improvement of a safety culture is expected in an SMS program, which is required across the aviation industry.

In order to measure the success of an ASAP program, the following four key metrics are presented:

- Change in the overall safety culture of the organization
- Employee–management Trust
- Changes resulting from ASAP reports
- Investment analysis of ASAP program

Change in the overall safety culture of the organization

A Safety Culture Index can be used to represent the safety culture in an organization. This index, in Figure 1 below, represents the safety culture along a zero-centered scale which runs from -5 to +5. At the -5 level, the culture is said to be “secretive,” which means that the employees know about several safety-related challenges in the organization, but are afraid to speak-up. Next, is a “blame” culture where employees who commit errors are blamed and possibly punished.

Next, is the “reporting” culture where effective reporting mechanisms exist, employees are encouraged to report their errors and a protection from punitive actions is provided. Ultimately, at the +5 level, the culture is called “just culture” where there is a predefined set of unacceptable behaviors to protect from recklessness or intentional disregard for safety and there is also a clear and highly effective process of implementing systemic solutions.



Employee–Management Trust

At the core of safety culture, is the employee–management trust. An ASAP program is dependent on the employee-management trust.

In organizations with low employee-management trust, there is a fear that management will use the information provided in the ASAP report to discipline the employee. However, all participating companies explicitly agree not to use information gained from a report for punitive purposes.

Sometimes, there are also trust issues between employees and the local FAA or between the management and the local FAA. The employees may not be convinced that the FAA inspectors will follow the protection protocol per the ASAP MOU.

Similarly, the management may not be convinced that the FAA will not overreact because of information contained in one of the ASAP reports.

Conversely, the FAA inspectors may also not be convinced that the company is actually taking steps to implement a comprehensive fix to the safety problem.

If the mutual trust levels among employees, management, and the regulator are too low, it may be impractical to launch

an ASAP program. In such cases, the interpersonal trust issues need to be addressed immediately.

The composite trust score for organizations with ASAP programs is significantly higher than of those that don't have an ASAP program.

It has also been demonstrated that supervisor trust improves after the implementation of an ASAP program.

Key questions attempt to quantify this level of trust on a scale of 1-to-5, where 1= strongly disagree and 5=strongly agree. Employees rate the following questions:

- My supervisor can be trusted to act in the interest of safety.
- My suggestions about safety would be acted on if I expressed them to my supervisor.
- I feel comfortable going to my supervisor's office to discuss safety problems.
- My supervisor listens to me and cares about my concerns.
- My supervisor trusts me.



Changes resulting from ASAP reports

The fundamental distinguishing characteristic of the ASAP program is that it drives improvement. Every accepted ASAP report results in organizational learning. Typically, about 70-75% of the ASAP reports cause a procedural change at the task level. For example, task cards or job cards are changed using an existing or a new document change process. About 20-25% of the time, the ASAP reports cause a change across the organization. For example, the document

change process itself might be changed, impacting all future document change requests. About 1-5% of the times, the ASAP reports cause an industry-wide change. For example, the report may result in a Service Bulletin or an Airworthiness Directive that impacts other organizations.

All changes resulting from an ASAP program must be documented so that benefits of the ASAP program can be clearly demonstrated.

Investment Analysis of ASAP Programs

An ASAP investigation in maintenance takes time and effort from a number of individuals and organizational units. These efforts need to be logged to keep track of the “man-hours” spent in the investigation-through-implementation process. Once the total resources used in implementing the comprehensive solution are tallied, they can be compared against the cost of the error.

Typically, airlines already collect data for the following performance metrics: flight delays, flight cancellations, return to gate, aborted take-off, return to field, in-flight engine shut-down, diversion to alternate airport, ground

damage, rework, lost-time injuries, insurance claims, unairworthy dispatch, fines for regulatory violations, incidents, and accidents. All these outcomes have costs associated with them. Although these costs may be incurred by different organizational units, the enterprise suffers.

Once these costs are aggregated, they can be tracked over time to determine the overall trend in these costs and this trend could be correlated with the ASAP program or any other safety initiatives that may be underway.

The image shows a large commercial airplane, likely a Boeing 787 Dreamliner, inside a hangar. The aircraft's sleek, metallic fuselage is highly reflective, showing bright highlights from the overhead lights. A prominent blue banner with white text is superimposed across the middle of the image. Below the banner, the lower part of the aircraft, including the landing gear and wing structure, is visible. The hangar floor is concrete with yellow safety lines, and various ground support equipment is scattered around.

FIFTH GENERATION HUMAN FACTORS

A large commercial airplane is parked in a hangar. The aircraft is white with dark accents. Below the aircraft, there are various maintenance equipment, including scaffolding, ladders, and tools. The hangar has a high ceiling with large windows. The overall scene is industrial and focused on aircraft maintenance.

MAINTENANCE TRAINING

What is a Fifth Generation Maintenance Human Factors Training program?

Maintenance Human Factors training programs have evolved through four generations since the first program was introduced in 1989.

First Generation: Crew Resource Management type training that focused on interpersonal communication skills and awareness of safety implications.

Second Generation: Directly addressed communicating and understanding maintenance errors—the focus was on types of maintenance errors and their implications.

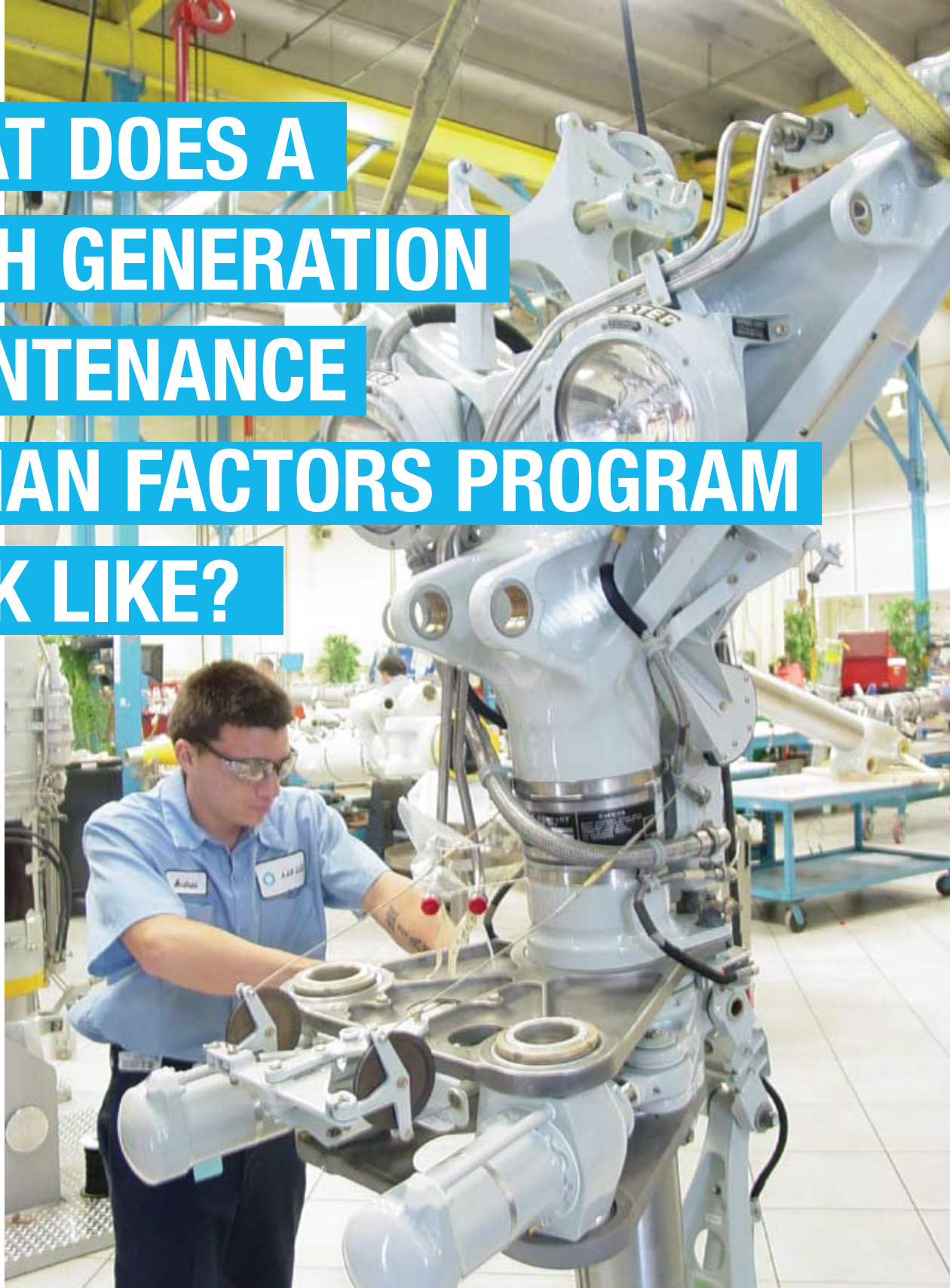
Third Generation: Focused on raising the awareness regarding twelve human factors issues that impact maintenance errors.

Fourth Generation: Focused on changing behavior through structured communication methods as well as by integrating the awareness of maintenance error investigation techniques.

Now, poised for the **Fifth Generation**, Maintenance Human Factors programs have the opportunity to achieve the following:

- Increase emphasis on individual professionalism.
- Integrate lessons learned from all safety and human factors programs into the Maintenance Human Factors training.
- Inform the participants of safety investment analysis.

WHAT DOES A FIFTH GENERATION MAINTENANCE HUMAN FACTORS PROGRAM LOOK LIKE?



While the intent of the Fifth Generation Maintenance Human Factors program may be to focus on behavioral change, there may be a continued need for basic instruction and uniform level of awareness about human factors issues in maintenance and ramp operations.

In order to ensure that all the participants are familiar with the basic terminology, a review of the FAA's Maintenance Human Factors Presentation System is recommended (<https://hfskyway.faa.gov>).



Increase emphasis on individual professionalism

—using the FAA’s Maintenance Human Factors Presentation System as the springboard, it is recommended that the instructors should proceed promptly to specific expectations of professionalism from the employees and managers. Some organizations have used the concept of “Key Behaviors” or professional standards to emphasize individual professional responsibility; others might use the “Pre-/Post-Task Checklist.” A discussion about how different individuals plan to address the human factors would be useful. For example, if “distractions” is identified as a human factors issue that influences maintenance errors, how do the participants plan to manage the distractions? What are some of the safety nets to consider? This will start shifting the conversation toward expectations of professionalism.

While conducting this discussion among managers, it would be valuable to engage them in discussing how they plan on reducing the distractions for the mechanics. If the distractions cannot be reduced, how would they plan on assisting the mechanic in coping with these distractions and preventing errors?

One element from the Fourth Generation programs is that of Structured Communication that was very successful in corporate aviation. This approach needs to be considered in other organizations so that mechanics and managers have a mean-



ingful way to communicate each other’s perspectives and also have a pre-agreed means of seeking external validation.

Integrate lessons learned from all safety programs

—now that there is ample evidence of how ASAP programs are improving safety in maintenance, other safety programs such as flight and dispatch ASAP, maintenance ASAP from other companies, or Flight Operational Quality Assurance (FOQA) and Voluntary Disclosure Reporting Program may be discussed in the Maintenance Human Factors training session. Several human factors issues as well as ASAP process issues could be discussed in this context. Ultimately, the participants should learn about how they can proactively submit ASAP reports and use the appropriate human factors terminology to facilitate the investigation. Active participation from ASAP Event Revue Committee members as well as those mechanics that have submitted ASAP reports is highly encouraged.

Inform the participants on the impact of investment in safety programs

—it is generally accepted that maintenance errors result in several million dollars annually; however, only a handful of organizations can clearly demonstrate the return on investments made in safety programs. A discussion about how much some of the maintenance errors cost could be highly educational. Examples from the previously discussed ASAP cases could be used to illustrate this point.

A suggested training outline for the program is as follows:

Review of Basic Maintenance Human Factors

Skills Training: Structured Communication

Introduction to the ASAP Program

Discussion of Case Studies

Discussion of Organizational Safety Culture

Investment Analysis of Safety Programs

HOW DO MAINTENANCE HUMAN FACTORS AND ASAP PROGRAMS SUPPORT SMS?

AAR CORP.

The Fifth Generation Maintenance Human Factors program and the ASAP program should be an integral part of the organizational Safety Management System (SMS). As such, they will support all four pillars of SMS: Safety Policy, Safety Risk Management, Safety Assurance, and Safety Promotion.

Safety Policy: Under the broad umbrella of the SMS program, an aviation organization may choose to support the Fifth Generation Maintenance Human Factors program, the Maintenance ASAP program, and the Safety Culture Assessment program. All these programs have mutual benefits as well as overall benefits to the individual employees, the organization, and the flying public. The aviation organization could make a commitment to the employees across the company that the Fifth Generation Maintenance Human Factors



program is an organizational priority: appropriate resources will be provided to implement and support the program; change initia-

tives associated with the ASAP program will be carefully considered using the Safety Risk Management approach and appropriate feedback will be provided to all reports; organizational safety culture will be assessed regularly and specific improvement efforts will be implemented; and employee and management evaluation and reward systems will incorporate adequate support for SMS.

Safety Risk Management (SRM): The SRM process provides an objective means of assessing safety risks. This process could be incorporated in the ERC deliberations so that all recommendations coming from the ASAP ERC consider the risk aspects—severity and likelihood—prior to making their recommendations. Subsequently, if the ASAP ERC's recommendation for a particular change action is not accepted by the company management, a corresponding SRM rationale could be provided by the management.

Safety Assurance: Tracking the changes accomplished as a direct result of the ASAP program would be the best way to meet this SMS requirement. Such actions should document the evidence of organizational change as well as emphasis on systemic solutions and the shift toward a Just Culture.

Safety Promotion: The measurement and improvement of safety culture is embedded in this SMS requirement in two places. First, it is an over-arching theme across the SMS program; second, it is specifically called out in the Safety Promotion pillar of the SMS program. Regular organization-wide surveys to measure safety culture, development of appropriate interventions to improve the safety culture, and administration of follow-up safety culture surveys to determine the effects of the preceding interventions is a good way to meet this requirement.



Active attention to the safety investment analysis, provided by the Fifth Generation Maintenance Human Factors program, supports all four SMS pillars. On the policy side, it clarifies the organizational priority—safety is an investment; efforts to protect or grow this investment will be supported, and a return on such investment will be communicated across the organization.

The Safety Risk Management approach allows the employees and management to consider risks of not implementing a particular safety intervention—the cost of the intervention could be measured against the cost of the event (the likelihood of occurrence of the event and the severity of the event). Also, some alternate intervention strategies could be developed. Regardless of the specific intervention strategies used, the discussion about the risks involved is valuable in improving the safety culture of the organization.

When an ASAP program results in task-level changes, it impacts just that task and consequently the benefits associated with that change are narrow in scope. However, when the changes impact an organizational unit or the entire organization, or even the industry, the benefits multiply. Consequently, the



return on investment at the organizational or national level is likely to be substantially higher than the return on investment at the task level.



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Skills Training: Structured Communication

The Structured Communication approach is a means to facilitate interpersonal communication.

There are four key elements to this approach:

- Pre-established standard of safety
- Validation of data
- Operational risk-taking requires compliance with pre-established standard of safety
- Review of decisions to minimize systemic inconsistencies or errors

Pre-establishment of clear and measurable standards of safety is critical. These standards should be objective, behavioral, and measurable. Once such standards are established, the various operational cases at hand could be handled accordingly. In the absence of such clearly stated standards, it is difficult to determine the safety versus productivity trade-off.

Validation of data is critical to understanding the real problem at hand. In aviation maintenance, there are several sources of data and in some cases, there are multiple interpretations of the same technical language in the reference documentation. Therefore, it is critical to validate all the data that are used to arrive at the safety decision. Mechanics in the field raise an important caution: validation is different from rationalization. So, while it may be tempting to rationalize one's understanding of regulations, procedures, or data, it is critical to validate. Such active validation is aimed at minimizing complacency and maximizing accountability.

Employees and managers generally agree that there are times when one has to push for productivity or adherence to schedule. However, the structured communication protocol requires that baseline safety standards be met first and adequate precautions be in place to keep the risk at an acceptable level.

Finally, it is also expected of the employees and managers to follow-through on any inconsistencies across the system—issues with data, organizational policies, vendor agreements, manufacturer's data, FAA guidance, etc. to ensure that adequate precautions are in place and conflicting or ambiguous information is minimized.



Discussion of Organizational Safety Culture

Culture can be defined as the environment in which things grow. Basically, a culture exists in every organization, called the organizational culture of that organization. The values, beliefs, practices, policies, norms, etc. all collectively shape or define that culture. Also, this culture has formed over a number of years and all the people in that organization have contributed to that culture.

From a safety perspective, Safety Culture represents environmental and psycho-social factors that influence attitudes and behaviors, which impact risk and performance in high-consequence systems. Environmental aspects include the classic building structures, work environment, and geographic location, as well as organizational structures, policies, processes, and practices that shape individual behaviors over time. The psycho-social factors are the



combination of psychological and social factors that influence the people's attitudes toward safety. For example, psychological items include stress, fatigue, tendencies to take risks, morale, motivation, etc.; while social factors include items such as social acceptance of assertiveness, acknowledgement of stress and fatigue, the need to maintain group harmony, etc.

Most safety culture studies focus on the psycho-social aspects; however, most barriers are either environmental or organizational. Typical barriers include organizational structures, policies, procedures, practices, employee evaluation criteria, accounting methods, past experiences of the employees, etc.

In order to move the safety culture in the desired direction, there has to be a top-down commitment to invest resources, break-down the barriers, and add incentives to reward the desired individual as well as team performance. Basically, **in order to change culture, people must change**. In order to change people, the motivations must be aligned with the organizational goals and incompatible motivations must be removed.

Employee and management evaluation systems play a critical role in transforming an organization's culture. If the evaluation systems don't change, the strategies to effect cultural change are likely to be paralyzed. If old punitive practices and policies remain in place, they will nullify the new initiatives.

In order to transform an organization's safety culture, coordinated efforts are required from a variety of organizational units such as the following: Human Resources, Legal Counsel, Business and Finance, Operational Units, and Bargaining Units.

What is “Intentional Disregard for Safety?”

“Intentional disregard for safety” needs to be examined from two perspectives. The first perspective is that of an absolute case. In this case, the emphasis is on “intention.” If a mechanic commits an act of vandalism or destruction that is clearly intended to harm the safety of flight, the absolute case may be substantiated. On the other hand, if it is not such a simple case, the norms in the organization or even at a particular facility need to be considered. For example, if it is a common practice at a facility to follow supervisor’s orders even when they may not be in compliance with the regulatory requirements or may be in violation of safety standards, the mechanic’s action may not be judged as an intentional disregard for safety.

When provided with sample cases for review by Event Review Committees from different organizations, there was some variability in what is considered an intentional disregard for safety. This variation in judgment was primarily dependent on the organizational norms in their respective organizations. It was also noted in subsequent interviews that the baseline behavioral expectations from mechanics and managers change over time. For example, it may not have been unusual for a mechanic to simply comply with a manager’s directive even if the mechanic knew that compliance with the directive might force him to violate federal regulations or company policy. However, after filing an ASAP report, this issue should have been addressed at a systemic level and both mechanics as well as managers should have been trained on how to handle similar situations in the future. If the old norms continue and the mechanics continue to violate regulations under management directives and/or management continues to direct mechanics to violate regulations or place them in situations where the mechanics don’t have any other realistic options, the behavior of both parties may be judged as intentional disregard for safety.

There are many other issues that fall in the gray area and warrant a community-level decision on whether or not the action constitutes intentional disregard for safety. Regardless of the scenarios, the judgment regarding intentional disregard for safety should rest on the respective Event Review Committee.

Note—as a result of the DOT IG report, a specific definition of intentional disregard is under development by the FAA.



What's the Relationship between the Voluntary Disclosure Reporting Program (VDRP) and the ASAP?

A voluntary disclosure program is designed for an FAA Air Agency Certificate holding organization such as an airline or a repair station to voluntarily disclose any unintended violations of Federal Aviation Regulations. This program allows for the organization to work with the FAA in a collaborative manner to correct systemic issues. Company violations accepted by the FAA are closed with administrative action in lieu of legal enforcement action.

In the case of maintenance actions that may be involved in a voluntary disclosure, it is not unusual for a voluntary disclosure to trigger ASAP reports from mechanics. In such an event, it is advisable for the organization to notify the appropriate mechanics or inspectors and encourage them to submit an ASAP report. Such reports are considered non-sole source to the FAA because the information about the possible and inadvertent regulatory violation was provided to the FAA via the Vol-

untary Disclosure Reporting Program (VDRP). It is equally possible for an ASAP report to trigger a voluntary disclosure by the company. If the original source of information on a company violation submitted under the VDRP is a sole source ASAP report, the ASAP report remains sole source to the FAA.

An ASAP program provides protection to the employee while the Voluntary Disclosure Program provides protection to the employer. So, if the company files a voluntary disclosure that identifies a violation by a mechanic, the mechanic may receive a Letter of Investigation from the FAA. However, if the mechanic files an ASAP report within the prescribed time frame of the applicable ASAP Memorandum of Understanding (MOU), the violation will be handled in accordance with the ASAP MOU. If an ASAP program is not available to the mechanic, it is advisable to file a report with the Aviation Safety Reporting System (ASRS Report).

ASRS Reports are confidential. Many ASAP programs have elected to automatically provide copies of the ASAP reports to ASRS. Such a practice ensures contribution to the national database of maintenance errors and also protects the reporter from the imposition of legal enforcement sanctions for a possible regulatory violation, even if the mechanic's ASAP report is excluded from the ASAP. The ASRS program does not protect against FAA enforcement action where accidents or criminal offenses are involved.



Resources

Websites

<http://www.faa.gov>
<http://www.hf.faa.gov/hfmaint/>
<http://hfskyway.faa.gov>
<http://asrs.arc.nasa.gov>
<http://www.asias.faa.gov>

Information Sharing Meetings

ASIAS Program Office
Office of Aviation Safety Analytical Services, ASA-100
Orville Wright Bldg. (FOB10A)
FAA National Headquarters, Room 1000
800 Independence Ave., SW
Washington, DC 20591
(202) 267-3188

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