

Development of Guidelines and Tools for Effective Implementation of an
Aviation Safety Action Program (ASAP) for Aircraft Maintenance Organizations

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First Year Report: August 2003-January 2004

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Project Summary

Research Statement

The goals of this research project are to (a) provide a comprehensive analysis of the Maintenance ASAP program in the United States, including the analysis of factors that contribute toward the development or lack of development of such programs and (b) design a safety-information communication and tracking system.

Background

The primary purpose of an Aviation Safety Action Program (ASAP) is to identify and correct adverse safety events that would otherwise not be likely to come to the attention of the Federal Aviation Administration (FAA) or company management. As of December, 2003, there are twenty-eight airlines that operate ASAPs for pilots, but there are only six ASAP MOUs for aircraft maintenance mechanics. Of the six maintenance ASAPs, most are considered by all stake-holders to be highly effective. Because of the potential benefits to safety, a major interest of the FAA is to determine whether the failure of ASAPs to expand to multiple operators as rapidly for aircraft maintenance as it has for pilots is attributable to FAA's ASAP policy, and/or to other factors beyond the control of the FAA.

First Year's Status

The first year's goal was to conduct a preliminary analysis of the ASAP program in order to identify specific factors that may contribute toward a successful or unsuccessful ASAP program. The two basic deliverables for the first year were as follows: (a) a survey questionnaire and (b) a preliminary list of best practices. Structured focus-group discussions were conducted at six partner companies. The results of these discussions indicate that the broad issues include employee-management-FAA trust, labor-management relationship, level of knowledge about ASAP program/process, and workload involved in management of an ASAP program. Based on the data collected through the focus-group discussions, a survey questionnaire called Maintenance ASAP Questionnaire (MAQ) was developed. This is a 104-item Likert-type questionnaire to be administered during the second year of this project. A preliminary list of best practices used by companies deemed to be successful at administering their Maintenance ASAP programs was also developed.

Introduction

In 1996, Aviation Safety Action Programs (ASAPs) were introduced in the flight domain with the hope of encouraging pilots to disclose their errors, and more importantly the factors contributing to their errors. With this knowledge, systemic solutions could then be implemented (Harper & Helmreich, 2003) to preclude recurrence. In the absence of specific disclosure by pilots, vital information is not available to the air carrier or the Federal Aviation Administration (FAA) and the solutions are not likely to be systemic. In order to encourage pilots to participate in such a program, the FAA developed specific guidance (AC 120-66) for all the parties involved: FAA field inspectors, pilots unions, and air carrier management. As delineated in this guidance material, the FAA was genuinely interested in obtaining safety-related information through a non-punitive program. Since its initial introduction, twenty-eight air carriers have entered into an ASAP agreement, and they are estimated to file between 3 and 12 ASAP reports per day (Harper & Helmreich, 2003). Generally, these air carriers are very satisfied with their programs and they believe that the program has identified systemic discrepancies that would not have been otherwise discovered.

In an effort to expand the scope of the ASAP programs, the FAA added guidance materials for the maintenance community (AC 120-66A and -66B). In spite of this maintenance-specific guidance, only six maintenance organizations have developed an ASAP agreement. A preliminary analysis of success factors and failure factors associated with ASAP programs among aviation maintenance organizations is presented in this report.

Literature Review

Since the Aloha Airlines accident in 1988, the Federal Aviation Administration (FAA) and the National Aeronautics and Space Administration (NASA) have sponsored several research projects in the area of maintenance safety. All the reports resulting from the FAA-funded research projects are available through the FAA's websites (see <http://hfskyway.faa.gov> and http://www.hf.faa.gov/maint_docs.htm). Considering that the current research proposal seeks to determine the success/failure factors in Maintenance Aviation Safety Action Programs, the review of literature will focus on the general status and scope of the Maintenance ASAPs and studies pertaining to self-reporting of errors.

Status and Scope of Maintenance ASAPs

Early interest in proactive non-punitive measures is evident in the Maintenance Resource Management Roundtables conducted at US Airways (Taylor & Christensen, 1998). An MRM Roundtable, as it was called, consisted of a representative from the company, a representative from the International Association of Machinists and Aerospace Workers (IAMAW), the FAA Principal Maintenance/Avionics Inspector, and the mechanic(s) who committed the error. A memorandum of understanding (MOU) was signed between the tripartite team (company, IAMAW, and the FAA) that would establish that the intent of a roundtable discussion was to collect safety-critical information that would not have come forward without direct and honest participation by the person who committed the error. The tripartite team endeavored to steer clear of the prevalent blame culture (c.f. Marx and Graeber, 1994) and seek a better understanding of the causal factors leading to the error. By adopting this approach, the team was successful in winning the labor force's trust and truly implementing comprehensive and

systemic solutions. In response to such a program, several key issues were resolved without resulting in an FAA enforcement action against the mechanic or the company. Unfortunately, the roundtable system was practiced only at US Airways and was difficult to duplicate at other companies because other people (including FAA inspectors and company managers) were not as amenable to such a system. (Taylor & Christensen, 1998).

Mechanics who did not have access to a roundtable discussion, had two other options: they could either submit a report to NASA's Aviation Safety Reporting System (ASRS) or use the guidance provided in Advisory Circular 00-58 (c.f. FAA, 1998) to file a voluntary self-disclosure report. The ASRS report may provide limited protection to the individual reporter, but the reporter's complaint may not be acted upon by the company management or the FAA because the individual reports are de-identified; however, NASA provides statistical information to the FAA if a significant number of reports identify the same problem. A self-disclosure report filed in accordance with AC 00-58, on the other hand, will provide additional legal protection and bring the reporter's concern directly to the company management and the FAA. This advisory circular is designed for a generic (not limited to maintenance) reporting of regulatory violations by all individuals as well as organizations. In practice, organizations use this protocol more frequently than individuals. Therefore, this approach is perceived by the industry as primarily an organization-level disclosure rather than individual-level disclosure. The current ASAP program is focused on the individual making the self-disclosure, providing specific legal protection to the reporter as well as supporting a collaborative relationship between the FAA and the Company.

Philosophically, there seemed to be an agreement between the FAA and the maintenance community that the mechanic who actually commits the error holds key information that was essential to the development of a true comprehensive solution. Such agreement is supported by extensive research in the area of error causation (Battles, Kaplan, Van der Schaff, & Shea, 1998; Gambino & Mallon, 1999; Van der Schaff, 1991 cited by Harper & Helmreich, 2003). The erring mechanic has no incentive (other than ethical obligation) to disclose his/her error without an effective non-punitive process in place. Therefore, the FAA issued guidance materials to develop Maintenance ASAP agreements (the pilot community had already established an ASAP program---in 1996). The purpose of a Maintenance ASAP agreement is to provide a non-punitive forum for mechanics to come forward and disclose their errors to the FAA and the air carrier so that systemic solutions could be implemented and similar errors, due to similar causes, could be minimized. Since the advisory circular pertaining to Maintenance ASAPs used language similar to the flight domain, it is hypothesized that it was difficult to apply in the maintenance domain. As of December 2003, there are six companies with successful Maintenance ASAP agreements (c.f. FAA 2003).

Self-reporting of Errors

It is evident from the exponential rise in the number of ASRS reports filed by mechanics since 1996 that mechanics are willing to report their errors (Patankar & Taylor, 2001). In an analysis of errors resulting in regulatory violations, Patankar (2002) discovered that the majority of the violations were in the area of the recommended standard practices and procedures for aircraft mechanics (Title 14 of the Code of Federal Regulation, CFR, § 43.13); whereas, rest of the violations tend to be pertaining to maintenance manuals and maintenance/inspection processes

(14CFR § 121.369). Assuming that the ASRS reports provide protection against punitive actions by the FAA in the case of unintentional regulatory violations, it is reasonable to infer that mechanics are likely to file an ASRS report if they think that they may have inadvertently violated a regulatory requirement or if they think that their employer is violating a regulatory requirement. Given that the ASAP agreement also does not protect individuals or companies against intentional rule violations, the motivating factors for individuals as well as companies will have to be studied further.

Reporting Behavior in Maintenance

In a recent study of reporting behaviors among 178 maintenance personnel in Australia, Fogarty (2003) reported that organizational factors/culture had a strong influence on the individuals' willingness to report maintenance errors. Fogarty concluded "employees were more likely to report mistakes in situations where management is communicative, open, and committed to safety values." In a similar study, Harper and Helmreich (2003), listed the following as factors that may influence an individual's willingness to report their own error: (a) mandatory versus voluntary system, (b) reporter protection, (c) ability to affect change, (d) fear of litigation and disciplinary action, (e) attitude toward the use of current reporting systems, (f) ease of use of the new/proposed system, (g) personal responsibility to address changes, and (i) management's endorsement of the new/proposed reporting system.

Methodology

Year I: August 2003 through January 2004

The first year of this project consisted of two phases: coordination phase and survey development phase. The coordination phase was critical to the success of this project because it focused on informing the stake-holders (air carriers, FAA inspectors, and labor unions) about the purpose and scope of this research project. It was essential that all these parties participate in this project. Focus-group discussions were used to develop a Maintenance ASAP Questionnaire (MAQ).

Description of the Sample: The total population of air carriers with ASAP agreements is twenty-eight. Of these, six have a Maintenance ASAP agreement. In this project, all twenty-eight air carriers as well as others who may have tried to establish an ASAP agreement were invited to participate. Three organizations with active Maintenance ASAP agreements and three without such an agreement participated in the focus-group discussions. The three organizations with active ASAP programs had two representatives from the company management, two representatives from the labor union, and two representatives from the FAA. The three organizations without an active ASAP program had 3-6 participants representing labor and management groups. In total, thirty-two individuals participated in the focus-group discussions.

Next year (February 2004-January 2005), the actual survey questionnaire will be sent to a nationwide sample of the larger maintenance community to get a reliable measure of the consensus among the maintenance professionals.

The Coordination Phase: Since the goal of this project is to identify the factors that contribute toward the development or lack of development of Maintenance ASAP agreements, it was essential to contact the stake-holders from organizations with successful ASAP programs as

well as those without an ASAP program. Therefore, the Principal Investigator (PI), in collaboration with the FAA (AFS-230) set-up informational meetings with (a) the ASAP representatives from three ASAP participating organizations and three that have tried to establish an ASAP agreement but failed and (b) FAA field inspectors associated with the Certificate Management Offices of the organizations identified in the above two categories. The goal of these meetings was to solicit the stake-holders' participation in this research project. The purpose and scope of this research project, the role of each participant, confidentiality of data collected (a separate non-disclosure agreement was signed by the PI), as well as the benefits/risks of participating in this research were clearly explained by the researcher.

The Maintenance ASAP Questionnaire (MAQ) Development Phase: Structured focus-group discussions were conducted at six organizations: three with maintenance ASAP programs and three without. A list of ten questions was used to facilitate the discussion. The questions and their corresponding responses are presented in the results section.

The focus-group discussions achieved two goals: first, they enabled the researchers to develop a list of best practices (used by the organizations with active ASAP programs) and second, they enabled the researchers to develop a comprehensive 104-item Likert-type questionnaire, called the Maintenance ASAP Questionnaire (MAQ) that would be administered to a nationwide sample next year. The preliminary version of this questionnaire was sent to partner airlines and the FAA for feedback. Based on the comments received, the questionnaire was revised. The final version of this questionnaire is attached in the appendix.

Results

Focus-group Discussions

A comprehensive list of responses to the focus group discussion questions is presented in this section. The list is not presented in a prioritized order. Also, frequency counts specifying the number of respondents bringing-up a particular issue are not reported because of small sample size. Again, the main goal of this study was to get a preliminary sense of the relevant issues.

The focus-group discussion questions are presented in a numbered list below; responses to each question are presented as bullet points.

1. What's the first word/phrase that comes to mind when you hear "Maintenance ASAP"?
 - Safety
 - Time-commitment involved; labor intensive
 - Impressed by airline's commitment
 - Impressed by union's resources
 - ASAP used to be viewed as a "Get out of jail FREE card" but the new MOU has changed it a bit
 - Long time in coming
 - Did not know, until several months ago, what ASAP was. Neither do our supervisors or mechanics. I questioned about 50-60 people about it.
 - Interesting company program.
 - Exposure

2. (A) What are some of the advantages of the ASAP program?
- We now know about things that are happening that we otherwise would not know about.
 - FAA's closer working relationship with the Union and the Company
 - Allows FAA to get changes made with Company and Union that would typically be much harder to get accomplished
 - Cuts out a lot of the red tape in getting things accomplished without issuing Letters of Investigation (LOI's)
 - ASAP reports are tagged by flight number and date. If we get multiple reports for the identical flight and date, I am automatically alerted. If we can have maintenance reports as well, we will be able to provide a more comprehensive investigation and more universally acceptable solutions. We can have a single repository for all ASAP data.
- (B) What are some of the hurdles in establishing such a program at your Company?
- A lot of trepidation in "giving up something", e.g., disciplinary action, enforcement action, etc.
 - Manpower resource issue
 - Cost prohibitive for small carriers
 - Complex maintenance issues sometimes take 10-12 actual hours to investigate. If done on a part-time basis, they could take up to one week.
 - FAA has final say-so in action taken under an ASAP program, regardless of the ERC decision.
 - Lack of consistency within the industry in dealing with the CMO's [FAA's Certificate Management Office] drives us to Washington.
 - Difficulty in attempting to get the employees to speak up
 - Local FAA concerned with their work scope change and a change in their enforcement power
- (C) If your Company has a Maintenance ASAP agreement, can you describe some success stories?
- More self-disclosures resulting from mechanics coming forward through ASAP
 - Issues at Company, e.g., tooling requirements, material requirements, etc. are being corrected. [Several specific examples were provided by the focus group participants].
 - Inspection buy-backs were increased/enhanced. Fleet Campaigns were increased.
- (D) If your Company does not have a Maintenance ASAP, have you tried to establish one? Why? Why not?
- Have not tried to establish one. The MEDA [Boeing's Maintenance Error Decision Aid, used to classify error types and contributing factors] process works. Concerned about FAA's involvement.
 - We currently have in place a strictly internal program. We have not attempted to implement an ASAP Program. Both the FAA and Company felt that the extra

manpower requirements required to implement the program (4 employees) would be a constraint.

- We believe that employees would be more reluctant to submit reports knowing that the FAA would be involved vs. be addressed strictly in-house.
- Unable to get Union's acceptance
- Viewed by many as a scam by the company

3. What are your views regarding the security or confidentiality of the data submitted under the ASAP agreement?

- Information needs to be shared with employees of "lessons learned"
- There have been no leaks that would compromise the program. Nobody can use ASAP information anyway.
- The Union is concerned about who maintains the statistical data that are generated by ASAP investigations and how they are used. If there is limited access to the data, can they be manipulated?
- Our company's primary concern is the public getting hold of the information/data.
- Our company is seriously concerned with security and confidentiality issues, since the FAA can remove an issue submitted under ASAP and place it in a punitive/administrative action process if they deem that it does not meet the ASAP guidelines. The local FAA has strong, unilateral powers under the ASAP.
- 100% success rate in maintaining confidentiality. People know about ASAP, but when other people ask our investigators why they are investigating certain issues, the members simply say that it is confidential.
- The ERC [Event Review Committee: FAA, Union, and Management representatives] protects and maintains all data.
- The people here don't trust the local FAA because they are likely to repackage the raw data to suite their needs.
- Company is concerned with the MEDA summaries going public—in the newspapers. That's what's holding-up the communication of MEDA results to the individuals.
- Confidentiality is about individuals not about situations---data discovered through an ASAP reports may result in fleet-wide campaign directive or fleet grounding.

4. What are your views regarding the comprehensive changes implemented as a result of an ASAP agreement, whether in your Company or another?

- Some ASAP reports have resulted in ADs [Airworthiness Directives]
- Need to reassure employees that all ERC recommendations will be implemented.
- Faster change process now. More authority due to the FAA's active involvement

5. How do you compare/contrast the ASAP agreement with pilots to that with mechanics?

- Flight ASAP agreement viewed as a "get out of jail free" card.
- The Flight Department ASAP is processed through their ASAP Manager. They had a process flow chart that they initially used for consistency and documentation purposes, but now that they are familiar with the process they simply use it for guidance. The Flight and Dispatch Departments have had approximately 600 submittals. About 75% were submitted by e-mail, 15% by their website, and hard-

copy submittals accounted for the final 10%. Maintenance MEDA submittals are processed through their Human Factors Manager.

- The Maintenance Department does not have an ASAP agreement. However, under their MEDA reporting system they received about 270 events last year. Only six were non sole-source. In other words, 264 would not have been known about if it had not been for their MEDA submittal process. Their approach is no harm, no foul.
- In the Flight Department, the ERC does not interview any of the submitters. They let ALPA [Air Line Pilots Association—a pilots' union] perform this task. This process is described in their policies and procedures, and not in their MOU. In Maintenance, the Union and Company jointly interview the involved employee.
- Flight ASAP gets 200-300 reports per week; whereas, maintenance ASAP gets that many a year. Yet, maintenance programs consume more investigative resources than flight.
- In maintenance ASAP, there are three independent investigations of the same incident: FAA investigation, QA investigation, and Mechanic investigation
- Most of the maintenance issues are deep and latent: some items are over 2.5 years old (when discovered) and the mechanics have forgotten what happened.
- Pilots and mechanics have very different ASAP programs—apples and oranges.
- Pilot cases are typically open and shut; very little research time is involved. In maintenance, there are a lot of misunderstandings that need to be clarified through validation of data

6. Why do you think that a disproportionately large number of airlines have ASAP agreements for their pilots but not for their mechanics?

- Pilots recognize problems instantly, mechanics do not.
- If a pilot does something wrong, it is too late.
- 90% of the pilot reports are sole-source reports
- 90% of the mechanic reports are not sole-source (but within company) reports
- No confidence by Maintenance employees in fairness by Management or the FAA.
- ALPA is very organized and therefore able to stay ahead of the ball. They have very good resources, both legal and technical, to provide prompt analysis and feedback.
- On the pilot side, if something bad happens, there's usually no immediate corrective action. Attention is focused on minimizing the effect of that action or on minimizing the recurrence of that action. In maintenance, there is relatively more time to contemplate on the decision, but the mechanic may not know for years that he made a mistake.

7. Are there any regulatory changes that need to be implemented prior to a better acceptance/implementation of the ASAP agreements in maintenance?

- Confidentiality issues should be covered in the FARs.
- Legal protection. The ASAP Committee could be working on an issue, and a mishap occurs related to the issue before final disposition has been determined. Liability?
- Confidentiality issues should be with the involved parties, not with the issues.
- Under the present Advisory Circular, the FAA has final call on action to be taken. This should be the joint responsibility of the ERC.

- How is maintenance outsourcing controlled, e.g., if a Repair Station has an ASAP Program and discovers an error previously committed by an airline employee, how is this handled? Similarly, what happens when an Air Carrier has an ASAP Program and discovers an error committed by a Repair Station employee?
 - The FAA holds the trump card on individual ASAP submittals. Training and reasonableness of individual FAA Inspectors are in question.
8. What type of support do you need from your company management for effective implementation of ASAP agreements?
- Need more resources at the Company to investigate and administer the Program.
 - Human resources to conduct investigations. Gained enough trust/faith in the company management that FAA does not have to take detailed notes. FAA has full support from their management
 - Need support up the entire management chain. At present, they are more concerned by actions taken by the more senior level management than the first level management. The further up the ladder, the more the information is skewed.
 - It is of the utmost importance that we obtain acceptance of the ASAP philosophy from management. Their greatest concern is the protection of internal information.
 - There needs to be a follow-up and communication of recommendations and findings.
 - Mainly infrastructure support and administrative help, also training
 - FAA needs a better training program for their inspectors. Currently, most of the information presented is available via the Internet. The FAA instructors could not answer any maintenance-specific questions.
9. What type of support do you need from your labor union for effective implementation of ASAP agreements?
- Need Maintenance Union leadership to understand what ASAP is all about. ALPA is very well structured to disseminate information. Education is less effective in maintenance.
 - Assurances that management will support the Program and that protection from punitive action will be provided.
 - The labor leadership needs to know what ASAP is. Good organization of ALPA is a plus for them, not so for other unions.
10. Do you see any alternatives to ASAP agreements that may work better?
- Voluntary disclosure programs may work if managed/handled appropriately
 - We need a program developed by mechanics for mechanics. A new ASAP A.C. needs to be created for maintenance, not just patching up the existing A.C. that was originally created for flight personnel.
 - The ASAP A.C. does not cover non-certificated employees.
 - Company-specific internal error management program
 - There's no other certificate protection program
 - Best program, needs a bit of tweaking. I would never have submitted reports without this program.

Best Practices

The following is a preliminary list of best practices used by organizations with active ASAP programs. This list is not specific to any one organization, but a comprehensive list of items noted at three organizations with active ASAP programs:

1. Addendum to the template ASAP MOU. Some companies may view the template MOU provided by the FAA to be incompatible with their corporate policy or otherwise difficult to work with. It was suggested that the template MOU be used with minor revisions and noted that there could be an addendum specifying the details about the Maintenance ASAP protocol. Such an addendum would allow individual companies to provide a much more feasible program, without having to go through a more cumbersome process of creating a custom MOU.
2. Almost all ASAP reports are accepted by the ERC. ASAP reports are typically submitted by mechanics or inspectors who want to self-disclose their own errors. In order for a report to be accepted by the Event Review Committee (ERC), which consists of two labor union representatives, two company management representatives, and two FAA inspectors (only one member of each constituency can vote), the ERC must agree that the error was unintentional. In reality, it is very difficult to prove that a particular error was intentional; consequently, almost all the reports submitted to the ERC are accepted. However, if the same individual(s) is involved in exactly the same error again, the ERC rules that error be considered intentional because the reporter should have learned from the past error.
3. Report by anyone in the company is considered to be a “sole source” report. In contrast to the flight operations, maintenance errors tend to remain dormant for extended duration and tend to be discovered by a person other than the one who committed the error. In order to minimize the probability of error reporting to be viewed as a “blaming” or “finger-pointing” activity, all reports that are reported by any company employee, regardless of the location, are considered sole source reports; the only condition being that the same incident/error must not be known to the FAA by other means outside the ASAP process.
4. Linking ASAPs from maintenance, flight, cabin crew, and dispatch can leverage benefits. Some companies are now able to link their multiple ASAP programs in such a way that unique relationships between errors made by mechanics, pilots, flight attendants, and dispatchers can be identified. Sometimes, it helps to have one ASAP manager handling all the ASAP programs for the company. Otherwise, a linked relational database would also work.
5. Separate facility for ASAP data with secure access. Security of the ASAP reports is absolutely essential in order to maintain the credibility of the program and all those who are involved in managing it. One company has a secure room, with extremely limited access, to store all the ASAP data. Whether the reports are submitted in hardcopy or electronic copy, the ASAP manager is responsible for tracking each report and maintaining the confidentiality of the reporter.
6. ERC investigations are segregated by employee groups. In order to make sure that each group (labor, management, and FAA) involved in a given maintenance error receives thorough and fair investigation, the ERC manages the investigations such that the management representative is responsible for conducting all the investigation and data collection related to issues of company policy and management roles, the labor

representative is responsible for conducting all the investigation and data collection related to the mechanics' involvement and extant work issues, and the FAA representative is responsible for conducting all the investigation and data collection related to regulatory issues as well as any role that certain FAA inspectors may have played in detecting or not detecting a particular maintenance problem. The ERC often solicits the help of specialists to ensure that the individual reporter(s) gets a fair treatment.

7. Opportunity for the reporter(s) to make their case. If the ERC believes that a particular error was intentional and therefore wants to reject the ASAP report, it provides an opportunity for the reporter to present their case in a face-to-face discussion. This allows both sides to honestly interact with each other and make the final decision based on complete information.
8. Labor union's clear message and leadership. Labor union's structure and leadership play a significant role in communicating the vital information regarding programs such as ASAP as well as maintaining effective communication with the management representatives of the company. One labor union clearly has a very strong network to conduct prompt and effective communication with its membership. This union also takes leading role in educating their membership about their individual responsibilities as maintenance professionals. A mentoring approach was quite visible.
9. The management's commitment. The company management undoubtedly has significant commitment to the process because ultimately, they have to implement the structural or procedural changes that may arise from the ERC recommendations. Since maintenance investigations tend to be cumbersome, the costs involved in both investigation as well as rectification of errors can be exorbitant. In all the companies observed, the management was steadfastly committed to making the required changes. Concurrently, it was understood by all parties in the ERC that these changes would be "reasonable" considering the operational needs.
10. Training and mentoring of ERC members. The ultimate test of any change program is whether or not that program survives after the initial leaders have moved on to other tasks. In order to sustain the "organizational learning," all ERCs seem to be taking an active role in training a partner or a junior member to take over the primary responsibilities when necessary. Also, all ERCs indicated that they would take precautions when the current people from either constituency are replaced—take extra efforts to maintain the integrity and intent of the ASAP process.

Discussion

Of the several issues that were raised through the focus-group discussions conducted for this study, it is important to note that interpersonal trust among mechanics, managers, and FAA inspectors play a key role. Also, the overall labor-management relationship tends to "flavor" all collaborative programs; ASAP is no exception.

The discussions regarding differences between flight and maintenance ASAP programs were particularly lively because they brought out some fundamental differences in the work environments of the two professional groups. The flight environment is linear; whereas, the maintenance environment is networked. In flight operations, there is a clear start and finish point and there are very limited number of people interacting with the flight for a short duration.

In maintenance, a large number of people interact with the aircraft over a geographically and temporally distributed space. Consequently, error identification, reporting, and responsibility issues are extremely complicated as well as complex—complicated because these can be technically challenging issues and complex because multiple parties are involved in generation as well as resolution of problems.

Conclusion

The results presented in this report provide a qualitative understanding of the multitude of issues that influence the success of ASAP programs in maintenance organizations. These issues are summarized in the following list:

- Labor-Management-FAA relationship
- Labor union's organizational structure and leadership
- Management's commitment to the ASAP process and consequential resource needs
- FAA's ability to disseminate clear and consistent guidance materials
- The personality of actual people involved in the ASAP process

In order to get a quantitative perspective on these issues and to understand the relative level of importance among these issues, a nationwide survey based on the results of this study is necessary.

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Appendix
Maintenance ASAP Questionnaire (MAQ)

Maintenance Aviation Safety Action Program (ASAP) Questionnaire (MAQ)

Dear Participant:

Under an FAA-sponsored research project, Dr. Manoj S. Patankar of Saint Louis University is conducting a survey of aircraft mechanics, maintenance managers, and FAA inspectors **to quantify the factors that may contribute toward the success or failure of an Aviation Safety Action Program (ASAP) in maintenance organizations.** Your participation in this study is very important. **Even if you have never heard of ASAP, please take a few minutes to respond to items that may apply to you.**

This questionnaire is being sent to a **randomly selected sample** of Aircraft Mechanic Certificate holders that was obtained from FAA's Airman Certificate Database. For example, if there are 15,000 mechanics, in a particular state, a randomly selected group of 1000 mechanics will receive this questionnaire. **The more people respond to this survey, the greater the reliability of our conclusions.** Therefore, we urge you to kindly take a few minutes to fill out this questionnaire. Once you have finished answering the questionnaire, please mail it directly to Saint Louis University via the enclosed postage-paid envelope.

Although demographic data such as position, years of experience, and year of birth are requested, **there is no way to identify individuals who participate or don't participate in this survey. Please keep all responses anonymous.** If we don't get enough responses to this survey, we will need to send out another questionnaire. In order to minimize the cost of this project, we urge you to respond to the first mailing.

Although this questionnaire appears to be very long, you don't have to respond to all the questions. Use the following instructions to determine which questions you need to answer:

1. Respond to all items in Section I: BACKGROUND INFORMATION
Section II: EMPLOYEES OF ALL ORGANIZATIONS, INCLUDING FAA
2. Are you an FAA inspector/employee?
 - a. If YES, complete Section III: FAA EMPLOYEES ONLY
 - b. If NO,
Does your company offer a Maintenance Aviation Safety Action Program? If you don't know, please ask your supervisor or your shop steward.
 1. If YES, complete Section IV: EMPLOYEES OF ORGANIZATIONS WITH ASAP PROGRAMS
 2. If NO, complete Section V: EMPLOYEES OF ORGANIZATIONS WITHOUT ASAP PROGRAMS

The alternative to participation is non-participation. If you decide to not participate in this study, simply discard this survey and the enclosed postage-paid envelope.

This project is approved by the Saint Louis University's Institutional Review Board from the Human Subjects protection perspective. If you have any questions about this study please contact Dr. Manoj Patankar at patankar@slu.edu or 314-977-8355. Thank you for your time and consideration.

I. BACKGROUND INFORMATION: Today's Date: ___/___/___

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|--|---|--|
| 1. Select Employer Type (Select all that apply): | | |
| <input type="checkbox"/> Major Air Carrier | <input type="checkbox"/> FAA-Approved Repair Station | <input type="checkbox"/> Corporate or General Aviation Operator |
| <input type="checkbox"/> Commuter Airline | <input type="checkbox"/> FAA | <input type="checkbox"/> Other: _____ |
| 2. Job Title: <input type="checkbox"/> Mechanic <input type="checkbox"/> Inspector <input type="checkbox"/> Other: _____ | 9. City and State: _____ | |
| <input type="checkbox"/> Manager <input type="checkbox"/> FAA Inspector | (OPTIONAL) | |
| 3. Years at current employer: _____ | 10. Highest Education Level: <input type="checkbox"/> High School | |
| 4. Years in current position: _____ | <input type="checkbox"/> Trade School <input type="checkbox"/> A.S./A.A. | |
| 5. Years of aviation experience: _____ (total) | <input type="checkbox"/> B.S./B.A. <input type="checkbox"/> M.S./M.A. <input type="checkbox"/> Doctoral | |
| 6. Present Shift: <input type="checkbox"/> Day/First Shift <input type="checkbox"/> Swing/Second Shift | 11. Work Location: | |
| <input type="checkbox"/> Midnight/Third Shift <input type="checkbox"/> Not on Shift-duty | <input type="checkbox"/> Line | <input type="checkbox"/> Hangar <input type="checkbox"/> QC/QA |
| 7. Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female | <input type="checkbox"/> Planning | <input type="checkbox"/> Shop <input type="checkbox"/> Stores |
| 8. Year of birth: _____ | <input type="checkbox"/> Engineering | <input type="checkbox"/> FAA-CMO <input type="checkbox"/> Other: _____ |
| 12. Have you heard about Maintenance ASAP Programs? <input type="checkbox"/> YES <input type="checkbox"/> NO | | |

II. EMPLOYEES OF ALL ORGANIZATIONS, INCLUDING FAA:

| 0 Not Applicable/ I don't know | 1 Strongly Disagree | 2 Slightly Disagree | 3 Neutral | 4 Slightly Agree | 5 Strongly Agree |
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Using the scale above, please circle the number that best describes your opinion.

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| 0 1 2 3 4 5 | 1. A mechanic who knowingly uses a substitute non-approved part or lubricant at the direction of his/her immediate supervisor in order not to delay completion of a job order is exhibiting intentional disregard for safety. | 0 1 2 3 4 5 | 11. When a mechanic in a Part 145 Repair Station commits an error, it should be covered by the Part 121 Air Carrier's ASAP agreement, if the work was performed for that carrier. |
| 0 1 2 3 4 5 | 2. "Reckless behavior" is same as "intentional disregard for safety." | 0 1 2 3 4 5 | 12. Procedural violations occur regularly in maintenance tasks. |
| 0 1 2 3 4 5 | 3. Intentional falsification of a job card or a maintenance document is an example of intentional disregard for safety. | 0 1 2 3 4 5 | 13. Most procedural violations are not safety-critical and/or get corrected prior to them resulting in any danger to flight safety. |
| 0 1 2 3 4 5 | 4. It is difficult to tell whether a particular part or a lubricant is "approved" or not. | 0 1 2 3 4 5 | 14. I will report my errors if I believe that my report is likely to prevent similar errors in the future. |
| 0 1 2 3 4 5 | 5. <u>Mechanics</u> sign off job cards in a hurry, not realizing that one or more items on the card may not have been accomplished. | 0 1 2 3 4 5 | 15. I will report my errors if I believe that I will not face regulatory violation from the FAA or disciplinary action from my employer. |
| 0 1 2 3 4 5 | 6. <u>Supervisors</u> sign off job cards in a hurry, not realizing that one or more items on the card may not have been accomplished. | 0 1 2 3 4 5 | 16. I would report my errors if it was a regulatory requirement. |
| 0 1 2 3 4 5 | 7. It is my responsibility to report my errors to my supervisor, regardless of the consequences. | 0 1 2 3 4 5 | 17. Effective <u>internal</u> error reporting systems are available within my organization |
| 0 1 2 3 4 5 | 8. The FAA regulations are so inclusive that almost any procedural violation that a mechanic may commit is also a regulatory violation. | 0 1 2 3 4 5 | 18. NASA's ASRS program offers adequate legal protection to mechanics if they were to report their errors. |
| 0 1 2 3 4 5 | 9. My supervisor can be trusted. | 0 1 2 3 4 5 | 19. I know proper channels to report safety issues |
| 0 1 2 3 4 5 | 10. My safety ideas would be acted on if reported to supervisor | 0 1 2 3 4 5 | 20. My supervisor protects confidential or sensitive information |

III. FAA EMPLOYEES ONLY: Are/were you involved in an ASAP program? YES NO

| 0 Not Applicable/ I don't know | 1 Strongly Disagree | 2 Slightly Disagree | 3 Neutral | 4 Slightly Agree | 5 Strongly Agree |
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Using the scale above, please circle the number that best describes your opinion.

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| 0 1 2 3 4 5 | 21. The ASAP program is the best use of our resources in order to provide an honest and meaningful surveillance over an air carrier or repair station. | 0 1 2 3 4 5 | 29. ASAP programs tend to reduce the FAA inspectors' enforcement power and thereby dilute their role as the "watch dog" of the industry. |
| 0 1 2 3 4 5 | 22. Our office does not have the resources to support an ASAP program with any of the certificate holders | 0 1 2 3 4 5 | 30. My supervisor fully supports an ASAP program |
| 0 1 2 3 4 5 | 23. I would write fewer violations if my certificate holder had an ASAP program | 0 1 2 3 4 5 | 31. Our ASAP training is adequate. |
| 0 1 2 3 4 5 | 24. I don't like it when a mechanic is able to get off the punishment by simply filing an ASAP report. | 0 1 2 3 4 5 | 32. In an ASAP program, the company as well as the labor union is likely to discuss issues that would never be considered in a conventional rule violation case. |
| 0 1 2 3 4 5 | 25. I have a good working relationship with my certificate holder (air carrier/repair station) | 0 1 2 3 4 5 | 33. The FAA's enforcement authority is not compromised by an ASAP program |
| 0 1 2 3 4 5 | 26. Each successful ASAP case results in an increase in the level of trust between the three parties: FAA, labor, and management. | 0 1 2 3 4 5 | 34. The FAA inspectors trust that the company managers will follow-through on their promises and truly resolve systemic problems. |
| 0 1 2 3 4 5 | 27. The FAA inspectors need to have better and standardized training on Maintenance ASAP | 0 1 2 3 4 5 | 35. Failure of an existing ASAP program will be a loss to all parties involved. |
| 0 1 2 3 4 5 | 28. I am pressured by my supervisor to generate violations. | 0 1 2 3 4 5 | 36. Some FAA inspectors do not believe in an ASAP program |

IV. EMPLOYEES OF ALL ORGANIZATIONS **WITH** MAINTENANCE ASAP (Not FAA Employees):

| 0 Not Applicable/ I don't know | 1 Strongly Disagree | 2 Slightly Disagree | 3 Neutral | 4 Slightly Agree | 5 Strongly Agree |
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Using the scale above, please circle the number that best describes your opinion.

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| 0 1 2 3 4 5 | 37. Maintenance ASAP programs allow companies to solve deeply hidden systemic problems that would never have come to light otherwise. | 0 1 2 3 4 5 | 53. The labor union does not blindly defend everyone that submits an ASAP report (Once in a while, there are real cases of intentional disregard). |
| 0 1 2 3 4 5 | 38. Honest involvement of the FAA inspectors in the ASAP program is critical to its success. | 0 1 2 3 4 5 | 54. Our company managers try to resolve the systemic issues to minimize future errors. |
| 0 1 2 3 4 5 | 39. The mechanics trust that the ASAP process will allow them to disclose their error without fear of enforcement action <u>by the FAA</u> . | 0 1 2 3 4 5 | 55. We use an error classification tool such as MEDA, TAPROOT, or HFACS to classify the errors reported in our ASAP cases. |
| 0 1 2 3 4 5 | 40. The mechanics trust that the ASAP process will allow them to disclose their error without fear of disciplinary action <u>by the Company</u> . | 0 1 2 3 4 5 | 56. We use our own error classification tool to classify the errors reported in our ASAP cases. |
| 0 1 2 3 4 5 | 41. The senior company management is seriously interested in reviewing the effectiveness of our ASAP program. | 0 1 2 3 4 5 | 57. The company has been supportive of most reasonable requests to resolve systemic problems. |
| 0 1 2 3 4 5 | 42. The ASAP program is good use of the FAA's resources in order to provide a honest and meaningful surveillance over their air carrier or repair station. | 0 1 2 3 4 5 | 58. There is pressure from senior company management to keep the ASAP program running smoothly. |
| 0 1 2 3 4 5 | 43. Maintenance ASAP cases involve detailed investigations that could take months to accomplish. | 0 1 2 3 4 5 | 59. An ASAP program offers much stronger legal protection to the mechanics than the ASRS program (NASA Form). |
| 0 1 2 3 4 5 | 44. In our organization, labor union takes an active part in ASAP investigations | 0 1 2 3 4 5 | 60. Failure of an existing ASAP program will be a loss to all parties involved. |
| 0 1 2 3 4 5 | 45. Each successful ASAP case results in an increase in the level of trust between the three parties: FAA, labor, and management. | 0 1 2 3 4 5 | 61. In our organization, most ASAP reports are viewed to be honest mistakes. |
| 0 1 2 3 4 5 | 46. The leads and supervisors encourage mechanics to file ASAP reports. | 0 1 2 3 4 5 | 62. If the same mechanic files repeated ASAP reports for similar errors, the Event Review Committee tends to view the mechanic as having an intentional disregard for safety. |
| 0 1 2 3 4 5 | 47. A problem with Maintenance ASAP programs is that it is a secret. Very few people know about the success of these programs. | 0 1 2 3 4 5 | 63. The FAA inspectors need to have better and standardized training on Maintenance ASAP |
| 0 1 2 3 4 5 | 48. Lessons learned from Maintenance ASAP cases should be shared across companies in order to create maximum positive change in the industry. | 0 1 2 3 4 5 | 64. In our company, we are able to connect maintenance ASAP cases with those found on the flight side of the company. |
| 0 1 2 3 4 5 | 49. Sharing ASAP lessons, even when the names and places are de-identified, are detrimental to the overall ASAP program. | 0 1 2 3 4 5 | 65. Lessons learned from Maintenance ASAP cases are too specific to the organizations involved and cannot be generalized. |
| 0 1 2 3 4 5 | 50. We need an industry standard for maintenance error classification. | 0 1 2 3 4 5 | 66. The company managers serving on the Event Review Committees receive full support from their superiors. |
| 0 1 2 3 4 5 | 51. As long as the only source of information about a particular maintenance error was through an ASAP report, that report is considered to be a "sole source" report. | 0 1 2 3 4 5 | 67. FAA inspectors, company management representatives, and the labor union leaders trust that each member will carry out their roles and responsibilities to the best of their abilities. |
| 0 1 2 3 4 5 | 52. The managers trust that the FAA will not ground their entire fleet of aircraft for seemingly minor problems. | 0 1 2 3 4 5 | 68. The FAA inspectors trust that the company managers will follow-through on their promises and truly resolve systemic problems. |

V. EMPLOYEES OF ORGANIZATIONS **WITHOUT** MAINTENANCE ASAP (Not FAA Employees):

| 0 Not Applicable/ I don't know | 1 Strongly Disagree | 2 Slightly Disagree | 3 Neutral | 4 Slightly Agree | 5 Strongly Agree |
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Using the scale above, please circle the number that best describes your opinion.

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| 0 1 2 3 4 5 | 69 | I need to know more about ASAP programs. | 0 1 2 3 4 5 | 87. | Our FAA inspectors do not believe in the ASAP program. |
| 0 1 2 3 4 5 | 70. | Maintenance ASAP programs are very time consuming. | 0 1 2 3 4 5 | 88. | An ASAP program is a "get out of jail free" card. |
| 0 1 2 3 4 5 | 71. | Our mechanics think that the data provided through the ASAP process will be altered by our management. | 0 1 2 3 4 5 | 89. | After hearing all the evidence, the FAA representatives on the ASAP committee/Event Review Committee may decide to call the error an intentional regulatory violation, and the management or the union cannot prevent it. |
| 0 1 2 3 4 5 | 72. | Our managers have leaked confidential safety data to the press. | 0 1 2 3 4 5 | 90. | I do not see any benefit in having an ASAP program. |
| 0 1 2 3 4 5 | 73. | Our managers are not likely to be able to determine whether a mechanic has truly made an honest mistake or he/she is covering-up for a much more serious problem with his/her work ethic. | 0 1 2 3 4 5 | 91. | ASAP is a means to force mechanics to tell on their peers so that management or FAA may be able to go after the "big offenders." |
| 0 1 2 3 4 5 | 74. | Coming to an agreement between our labor and management groups regarding an ASAP program is difficult. | 0 1 2 3 4 5 | 92. | ASAP program relies on the FAA and company management to compromise their control over the mechanics. |
| 0 1 2 3 4 5 | 75. | The Aviation Safety Reporting System operated by NASA (the NASA Form) provides adequate regulatory protection to the mechanics. | 0 1 2 3 4 5 | 93. | Our management is concerned that the FAA may find out about a systemic problem and force the company to ground a large fleet of airplanes for a relatively minor problem. |
| 0 1 2 3 4 5 | 76. | Aviation Safety Action Programs are not necessary in our organization. | 0 1 2 3 4 5 | 94. | I work for a Part 145 Repair Station. We perform maintenance for a Part 121 operator that has an ASAP program, I wish our maintenance errors were covered by their ASAP agreement. |
| 0 1 2 3 4 5 | 77. | Our FAA inspectors have been our company employees. | 0 1 2 3 4 5 | 95. | Our mechanics feel comfortable reporting safety problems to the management. |
| 0 1 2 3 4 5 | 78. | I have reviewed another company's maintenance ASAP program | 0 1 2 3 4 5 | 96. | Our management is responsive to the safety concerns raised by the mechanics. |
| 0 1 2 3 4 5 | 79. | I have reviewed our company's flight ASAP program. | 0 1 2 3 4 5 | 97. | Our mechanics participate in evaluating their manager's performance. |
| 0 1 2 3 4 5 | 80. | Our mechanics don't trust the company management. | 0 1 2 3 4 5 | 98. | Our company has so many problems that it cannot afford to have an honest ASAP program. |
| 0 1 2 3 4 5 | 81. | I am not clear regarding the interpretation of the term "sole source" with regard to ASAP reports. | 0 1 2 3 4 5 | 99. | Our mechanics are afraid that the ASAP investigations will be conducted by someone who does not understand the maintenance process. |
| 0 1 2 3 4 5 | 82. | Our internal safety programs are effective in improving maintenance safety. | 0 1 2 3 4 5 | 100. | Our mechanics believe that they don't have much control over the company's negative practices. Consequently, they don't have much faith in the ASAP or similar processes. |
| 0 1 2 3 4 5 | 83. | ASAP program conflicts with our company's disciplinary policy. | 0 1 2 3 4 5 | 101. | Our managers have altered safety data in the past. |
| 0 1 2 3 4 5 | 84. | The current employee morale and trust levels are not likely to be supportive of the ASAP program. | 0 1 2 3 4 5 | 102. | ASAP programs are only effective where there are effective labor unions |
| 0 1 2 3 4 5 | 85. | Our mechanics don't trust the local FAA. | 0 1 2 3 4 5 | 103. | There are much more serious problems than ASAP that need to be addressed. |
| 0 1 2 3 4 5 | 86. | Our management doesn't trust our mechanics. | 0 1 2 3 4 5 | 104. | The current ASAP program (based on AC 120-66B) should be re-written for mechanics. |