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In this Issue:

A Brief Overview of Safety Management Systems (SMS)

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SMS

A Brief Overview of Safety Management Systems For Aviation Professionals

As the issue of aviation safety becomes increasingly important worldwide, developing a consistent application for diverse airport safety needs and requirements is crucial to the industry and those who rely on it. This overview seeks to present a concise, general picture of the SMS system and its relation to current US and international aviation safety laws, the potential benefits of SMS implementation, and the ultimate relevance of SMS to aviation professionals. FAA guidelines, SMS program elements, and research still required for success will also be briefly discussed.

Introduction

As air traffic activity continues to grow in the United States, the issue of accident prevention becomes increasingly important to the aviation industry, as well as to related regulatory agencies and the public at large. The ability to detect and prevent safety problems from occurring relies on a thorough, well-researched application of aviation safety principles, consistent and yet tailored to individual airport needs and conditions.

As an example, the FAA made the decision to implement a "pilot program" designed to evaluate the application of unified Safety Management Systems (SMS) at U.S. airports. These SMS programs were to be tailored to individual airport needs, while also taking into consideration the new SMS protocols which had been set down for international airports as well. This program has the potential to have an enormous impact on the aviation industry as a whole and on aviation organizations and professionals in particular.

Overview of SMS program

Background

The November 2005 amendment to Annex 14 by the International Civil Aviation Organization (ICAO), which set SMS as a regulatory

standard for all international airports, led the FAA to anticipate SMS soon becoming a regulatory requirement for U.S. airports as well. New focus was also being brought to the issue of aviation safety due to ever-increasing industry growth and expansion and the related increase in air traffic. Detection and prevention of problems became a matter of paramount importance, especially as sensational media coverage of aviation incidents brought about increased public scrutiny of airline safety practices and procedures.

A consistent approach to aviation safety was required, but the FAA was insistent that new rules be tailored to specifically complement existing U.S. safety regulations rather than simply copying new international standards. To this end, it was decided to select a small number of airports of varying sizes to participate in the development of a Safety Program Manual (SPM). Airport operators would be expected to draw SMS principles from all currently available industry guidance documents during this process. The SPM would then be used to determine if there were significant discrepancies between the current Airport Certification Program and the developing SMS program.

Objectives

The development of safety policies, procedures and practices is best approached systematically, requiring a good deal of planning, organization and communication. This approach is central to creating an effective safety culture, such as the one SMS seeks to create for the aviation industry. Effective safety cultures distinguish themselves through having clearly defined procedures, a well-understood hierarchy of responsibilities at all levels, and clear lines of reporting to facilitate effective and useful communication regarding safety issues. The establishment of an effective aviation safety culture is a main objective of the SMS program, one which promises to benefit the industry by improving safety in the face of projected airline traffic growth and increasing the likelihood that safety problems will be detected and corrected before an accident can occur.

Implementation of the pilot program will also allow airports and the FAA to gain experience establishing airport specific SMS that are tailored for the individual airport. This information will provide FAA information on

SMS best practices and lessons learned that will be helpful as FAA considers development of a Notice of Proposed Rulemaking to incorporate SMS into *14 C.F.R. Part 139, Certification of Airports.*

FAA guidelines

To promote continuity, the FAA has limited the scope of the developing SMS program to address 20 specific points, including a written safety policy statement; employee plans for communication, training and reporting; identification of responsibilities for key personnel; documentation maintenance, storage and review procedures; comparison of current procedures with SMS; and a schedule and estimated costs for implementation. The development of the manual will begin with the Gap Analysis, followed by the Draft Plan and then the completed Final Plan, which is to be submitted to the FAA within the guidelines of a set six-month schedule.

Following the completion of the development program, the FAA will consider implementing a formal SMS requirement for the approximately 570 certified airports in the U.S. The issue will be presented by the FAA for public comment in 2008 before final decisions on implementation are made.

Contents and Scope of the SMS Program

1. Written safety policy statement and description of how it is communicated to airport employees.
2. Identification and description of the airport safety goals.
3. A plan for employee SMS indoctrination and training. SMS indoctrination training should provide an outline of proposed curriculum and resources.
4. Documented process to identify training requirements for systems safety.
5. A plan to validate training effectiveness and the process to gain training feedback, including useable metrics.
6. A defined process to communicate safety policies and objectives throughout the organization. Include examples of how information will be communicated and any processes for follow-up.
7. A plan and description of employee non-punitive reporting systems, existing and planned.
8. A organizational chart identifying the names and safety responsibilities of all key personnel, such as the following:
    a. Top Management
    b. Safety Manager
    c. Department Heads/Managers
    d. Established Safety Committees and Chairpersons
9. Description of the safety risk management process, including application of "The Five Phases of SRM (safety risk management)," as discussed in AC 150/5200-37, Introduction to Safety Management Systems for Airport Operators.
10. Guidance on the use of SRM and trend analysis.
11. Defined process for documenting the results of SRM, including a description of how documents will be stored, i.e., electronic or paper.
12. Description of how top management will follow up on SRM to ensure safety mitigation strategies are appropriate.
13. A description of the airport quality management and/or risk management program (if applicable) and its integration into the airport SMS.
14. Description of a plan to integrate apron safety management into the airport SMS. (The FAA's review of the plan will be limited to measures for preventing accidents or incidents involving aircraft.) The plan could include the following:
    - A description of current apron safety management practices, such as reporting requirements to the National Transportation Safety Board (NTSB), Flight Standards, or the Occupational Safety Health Administration (OSHA).
    - An explanation of how current apron safety management practices meet the intent of SMS. This could include the safety plans and practices of tenants and operators at the airport, which should complement the airport SMS.
15. A detailed method to document self-auditing processes and their findings. Self-auditing may be part of the airport self-inspection process. If it is, explain how the self-inspection process addresses systems safety, i.e. if the self-inspection program identifies a hazard on the airport it should determine the risk and document the process for follow-up.
16. A detailed method to document self-inspection reviews, analysis, and findings.
17. A description or plan to integrate the tailored SMS program plan into the overall operation of the airport.
18. Documented plan for training and education, safety communication, competency, and continuous improvement processes.
19. Procedures to promote safety awareness and participation in non-punitive reporting systems.
20. Process to document and review lessons learned from within the organization.
21. Schedule for implementation and anticipated associated costs.

FAA: SMS Pilot Study Guide April 2007

Elements of SMS

The FAA and ICAO, concurrent with generally accepted industry standards, identify four main elements as being crucial to SMS:

- *Safety policy and objectives*. The establishment of a formal safety policy signed by senior management must include top-level commitments to implement SMS at the highest priority, provide safety resources, and continuously improve safety practices, as well as including an outline of responsibility and accountability, the establishment of clear reporting lines, and the creation of a Safety Manager who reports to the highest level of management.

- *Safety risk management (SRM)*. SRM procedures identify hazards and potential risks and encourage the design of risk mitigation strategies. The SRM process includes five phases: description of the system, identification of hazards, determination of risk, assessment and analysis of risk, and treatment (mitigation, monitoring and tracking) of risk.

- *Safety assurance*. Safety assurance policies establish consistent organizational systems for auditing, oversight and correction of discrepancies, as well as providing for solicitation of input and systematic review of available feedback from multiple sources.

- *Safety promotion*. Safety promotion encompasses all aspects and levels of safety-related education and communication within the organization, and directs resources toward the goal of continuous improvement set forth in the formal safety policy.

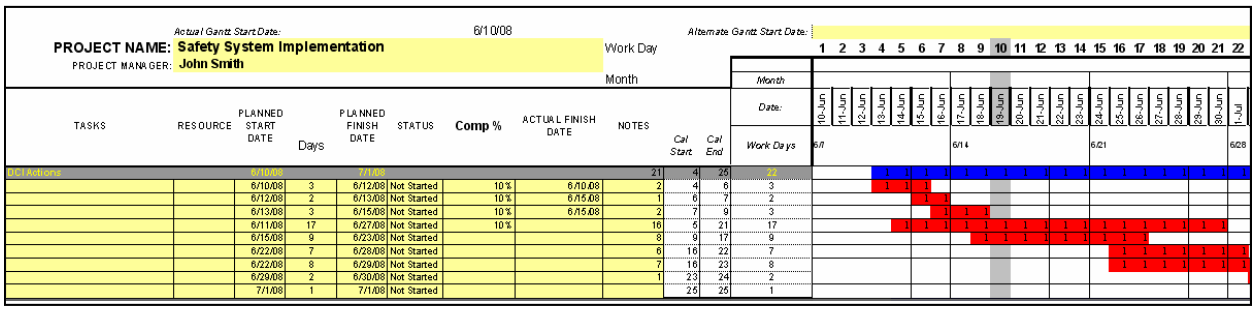
SMS Implementation

Implementing SMS can be a challenge. Current airport policies must be evaluated against SMS requirements, and the proposed SMS policy must be in line with the company's business objectives. Clear lines of communication must be maintained throughout the process, and the company must be honest in assessing its current methods, successes and failures. Everyone in the company from top management on down must be committed to making the new system work. Strict accountability must be maintained, especially among managers who are responsible for communicating and enforcing the new rules and procedures to other employees. And management must at all costs avoid sticking their heads in the sand when reports come back that show no further need for improvement – an effective program will be an ongoing process for improvement, and a system which consistently turns up no violations or deficiencies cannot be considered effective. This can be frustrating for those within the company who would prefer to see SMS as a 'fix' rather than a proactive, continuing process. In order to be

effective, SMS must create and enforce a culture of safety, not simply provide a checklist of finite problems which must be corrected to achieve compliance, and this approach is often radically different than an airport's existing safety program.

> **"SMS is a rigorous and formalized approach to identifying hazards, assessing the related risk, and identifying and prioritizing the best way to intervene. Then, we measure the effectiveness of our actions. It is a continuous loop."** - *Marion C. Blakely, FAA*

The creation of a system safety implementation plan is vital to the success of any SMS program. An effective plan will not only tailor the implementation to the needs of the company and its available resources, but it will also provide a roadmap for directing and tracking changes as well as problems throughout the implementation process. The information and insights which can be gained by strict adherence to and study of the well thought out implementation plan can be invaluable to the ongoing success of the company's SMS program. The following illustration shows an example of how the system safety implementation plan may be laid out simply and efficiently for use throughout the implementation of an SMS program:



Further Research

In order for SMS to achieve its objectives and be an ongoing success, further research into best practices, risk management, regulations and requirements will obviously be needed. While these will all be addressed to some extent by the development program set forth by the FAA, there are certain areas which may require additional investigation. A formal study of the skill sets required for successful aviation safety professionals, for example, could be a great asset toward further refinement of SMS.

Conclusion

The establishment of a consistent, well-researched standard of aviation safety practices, applicable to the needs of all aviation service providers, will benefit the entire aviation industry and the public in the years to come. Improved air transportation safety will no doubt contribute to the projected increase in

air traffic, as well as further improving public perception of such travel's safety. And the refinement of SMS will of course continue to be an ongoing process, building on established best practices and industry standards and moving forward as new information is acquired and applied in the field of aviation safety.

References

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FAA Advisory Circular 150/5200-37. *Introduction to Safety Management Systems for Airport Operators*.

FAA Office of Airport Safety and Standards ACP. 2007. *SMS Pilot Study Participant's Guide*.