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# Safety Management System Implementation and Personnel Issues at Small Airports

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Safety Management System Implementation and Personnel Issues at Small Airports

by

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An Independent Study

Submitted to the Graduate Faculty

of the

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in partial fulfillment of the requirements

for the degree of

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This independent study, submitted by Kyle Fischer in partial fulfillment of the requirements for the Degree of Master of Science from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.

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(Advisor)

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## Abstract

In accordance with International and Domestic mandates, Safety Management Systems (SMS) are being developed and implemented by many domestic and international airports. These systems provide a top-down, business-like approach to managing safety risk. The implementation of these programs is difficult due to the many different organizational structures and regulatory requirements of airports. The implementation of SMS at small airports will affect airport personnel in many ways. This research effort investigates an airport's intentions of implementing SMS and the effects to the organization's personnel.

## CHAPTER I: INTRODUCTION

Implementation of a new plan or idea always presents new challenges and opportunities for the employees and personnel who will work with them. The Federal Aviation Administration (FAA) is currently reviewing Safety Management Systems (SMS), and considering the possibility of a national mandate to all commercial airports to implement SMS. Safety Management Systems can change many aspects of how airport's will operate on a daily basis, and can greatly affect the roles and responsibilities of all airport personnel responsible for safety. Airports in the United States are many different sizes, and have different organizational structures, as well as different daily operations and goals. This makes it difficult to implement the same program, or idea, at every airport. The FAA faces many challenges with implementation of Safety Management Systems, and one of the greatest challenges is how the personnel who are asked to develop, implement, monitor, and work with these systems will be affected by the change.

### Purpose Statement

The purpose of this study is to determine the effects of SMS implementation on employees at small airports. This study is designed to determine how current employees would be affected, whether airport managers felt additional personnel are necessary for successful implementation, and whether they will hire new personnel at their airport, or

add SMS duties to current employees. This study identifies the how small airports intend to handle some personnel issues related to SMS implantation.

This is an initial study designed to identify how certain airports are planning to handle the implementation, and identify areas where follow-up research will be necessary.

This research focuses on three airports of various sizes to determine how they will implement the findings found in the first two FAA pilot studies, and how this new program will affect the duties and responsibilities of the airport employees.

#### Statement of the Problem

Implementation of SMS requires many new duties to be completed, in order to make the SMS a valuable tool. Airport managers can choose to divide these duties among current employees, or to outsource the duties to an airport consultant hired by an airport specifically to carry out the duties of creating a SMS program. Many small airports that currently operate under Federal Aviation Regulation (FAR) part 139 are currently operating with a minimum staff. Implementation of a SMS will place additional workload on current employees forcing airport management, and SMS management, to make decisions about hiring additional staff, or adding the duties to the staff's current responsibilities. This decision for additional workload will immediately affect employee's responsibilities, and their effectiveness in their current positions.



### Significance of the Study

Personnel are one of the most important factors of implementing and maintaining an SMS as at airport. Understanding how small airports plan to handle the issues and demands of the SMS with their personnel can be significant to airport management when they implement SMS at their airport. Follow up research can be designed in order to determine how the intentions and decisions of these airports affected SMS implementation. The follow up research can also study how SMS managers prepared and trained their employees leading to implementation, in order to identify strategies and tactics that were the most effective.

### Research Questions

1. Do small airports intend to hire new employees to work specifically with SMS?
2. Would small airports hire additional personnel to work specifically with SMS, if funding were provided?
3. Whom will small airports assign the major responsibilities of the SMS plan?

### Limitations of the study

The airport personnel interviewed for this study are either preparing to develop their SMS strategies, or have developed a plan and have yet to implement it. Since these airports have not fully implemented their SMS, their assessment of personnel issues and needs have not been validated by practice.

The number of airports that have participated in FAA pilot studies, or have begun to design and implement SMS is still limited. The majority of airports that have begun to implement SMS are large airports. Most small airports have yet to implement SMS's, even those who participated in the FAA studies. This leads to a lack of current and available information in this area.

## CHAPTER II: BACKGROUND/LITERATURE REVIEW

### SMS Overview

A Safety Management System (SMS) is a formal, top-down business-like approach to managing safety risk. These systems are comprised of four pillars, safety policy, safety risk, safety assurance, and safety procedure. (FAA, 2007) Safe operations should be one of many priorities of all airports. All airports attempt to operate with zero accidents and incidents; however, a one hundred percent safety rate is an unachievable goal. The constant changing airport environment and drive for safe operations presents many opportunities to improve the safety culture, and practices within an organization. The pillars SMS are aimed at creating a proactive safety environment, instead of reactive, as it has been done in the past. (ICAO, 2006)

An overall goal of SMS is to create a proactive safety environment by analyzing current practices, providing an environment that allows for identification and reporting of hazards, and implementing plans to make necessary changes to the safety organization and culture. By itself, no written procedure can make an environment safer without being monitored, maintained, evaluated, and practiced correctly. This is why airport personnel are integral parts of the SMS.

SMS will be an International Civil Aviation Organization (ICAO) standard beginning November 2010. The FAA is also asking airports to implement SMS in order to comply with the ICAO requirements. The FAA will use the findings from the FAA pilot studies to

issue a Notice to Proposed Rule Making (NPRM) in 2010, in order to gain public perspective regarding SMS. (Landry, 2009)

The FAA has already completed two pilot studies regarding the implementation of SMS. The first pilot study included twenty airports with the goal of establishing airport specific SMS and how each plan needs to be tailored to meet the needs of each airport. The second pilot study focused on smaller airports (Class II, III, and IV airports), this study included nine airports that did not participate in the original FAA study.

These studies focused on gap analysis, SMS manual development, and overall plan development. A third study is currently ongoing as a follow-up to the previous studies. This study is a follow-up study of three airports who were involved in the initial FAA studies. This follow up study is designed as a “proof-of-concept” study to determine how implementation will take place. (Watson, 2009)

The Seattle-Tacoma Airport has been a major contributor to the studies, and information gained by the FAA. They have reported the following information to the FAA. The Seattle-Tacoma airport notes that airports must specifically tailor their SMS to the conditions, requirements, and resources of the aerodrome operator, so it meets the specific needs of the airport. The airport emphasizes that SMS is not an exercise in futility, and there is a payoff at the end. They also suggest that most airports’ needs for a functioning SMS are likely already incorporated within many different plans at most airports. (FAA, 2008)

The FAA is currently considering the best way to introduce an SMS requirement at more than 560 U.S. airports certified under Federal Aviation Regulation (FAR) Part

139. The FAA is being proactive in introducing and demonstrating the value of SMS at airports. Kari Spencer, SMS project manager for FAA's airport safety and operations division, relates, "We are basically in the beginning phases of SMS in the airports industry." One of those first phases includes redefining what it means to be a Part 139 airport. Spencer notes that a major problem is that in the U.S., airports certified under Part 139 vary greatly in class, size, and operation. She feels that the FAA will need to amend FAR part 139 in order to require SMS. (McAllister, 2009)

### SMS Duties

The implementation of SMS will require that the personnel who are actively involved in airport safety perform many new duties. The following steps identified by the International Civil Aviation Organization indicate many of the responsibilities (ICAO).

ICAO defines the following as the "Ten Steps to an SMS":

1. Planning
2. Senior Management's Commitment to Safety
3. Organization
4. Hazard Identification
5. Risk Management
6. Investigation Capability
7. Safety Analysis Capability
8. Safety Promotion and Training
9. Safety Management Documentation and Information Management
10. Safety Oversight and Safety Performance Monitoring

A major concern by smaller airports and SMS implementation is who will be performing the duties of the SMS. Each of the previously mentioned steps incorporates many responsibilities, some of which may already be covered by current safety practices; however, the SMS will still present new duties, and requirements for each of these steps.

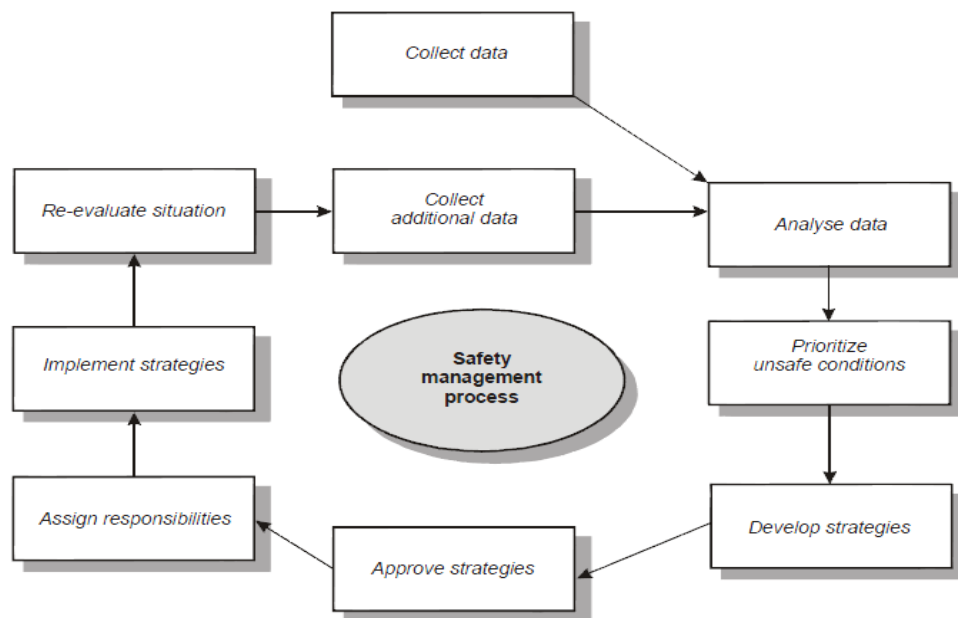


Fig. 1 – Example SMS Safety Process

## Airport Organization and SMS Roles

SMS implementation requires those in charge of designing SMS's to customize each plan to suit the individual needs of the airport. Designing SMS's cannot be completed by following a prescription, what is important is that each of the four SMS pillars, or functions, is effective, and not just present. (Landry) There are several ways of meeting an organization's needs for safety management. There is no single model that applies to all airports. Size, complexity and the type of operation, as well as the corporate safety culture and operating environment, will influence the structure most suited for individual organizations and their unique circumstances. Some organizations will require a formal safety management system. (Ayers, 2009) Others may require most airports to perform the same functions, but with a less structured approach. Some may also face resource limitations, and may only be able to carry out selected safety management activities. The degree of formality and rigidity in the SMS should be a reflection of the organizations needs, rather than blind adherence to doctrine. It is important that the size and complexity of the SMS be appropriate for each organization. (ICAO) The following examples illustrate how airports can incorporate SMS into existing organizational structures. Figure 2, is an example of the SMS structure at Seattle-Tacoma, and Figure 3, is an example of a small airport organizational structure.

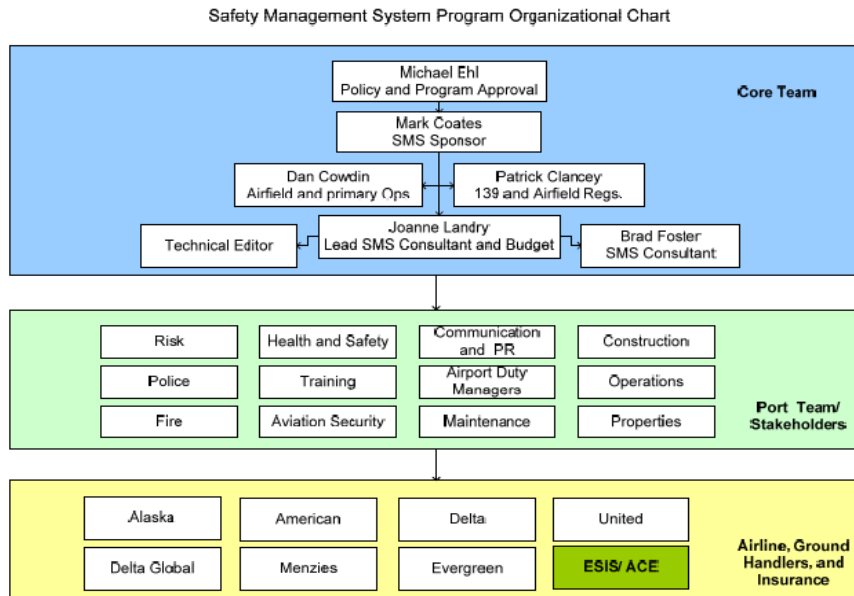


Fig. 2 - SMS Organizational Chart for Seattle-Tacoma Airport

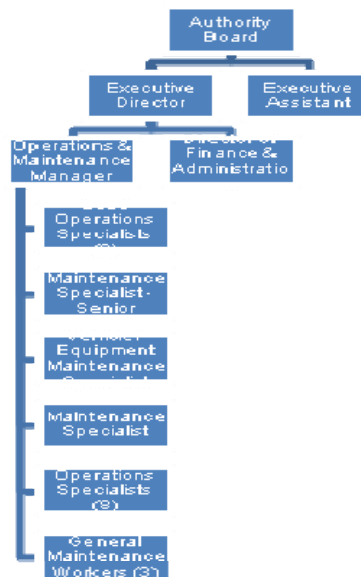


Fig.3- Example Organizational Chart at Small Airport



## SMS Personnel

The implementation of an SMS needs to start at the top levels of the organization. Successful implementation requires top-level managers to be involved in and committed to overall safety and safety practices. The implementation of an SMS will require many new positions, and responsibilities by airport personnel. Any airport that implements SMS will need to appoint a SMS Director. (Ludwig, 2007) The SMS Director will manage the daily functions of the SMS, including system monitoring, evaluating the effectiveness of corrective actions, providing periodic reports on safety performance, and providing independent advice to senior level management and other personnel on safety-related matters. This person needs to be actively involved with safety, and have access to the top-levels of the airport administration.

The SMS director needs to be someone who has experience in aviation safety, and operations. A director, or assistant director, have been identified by airports as the most likely personnel to be assigned this position, as they have the experience, and appropriate means to do the job effectively. The SMS Director needs to be readily accessible to anyone wishing to be in contact with him or her, and should be proactive in retrieving safety information. The SMS Director is the focal point for the development and maintenance of an effective SMS. The Director is also likely to be the main point of contact with the regulatory authority for many safety issues. It is imperative that the Director have access to airport personnel actively involved in the decision-making process and other major organizational functions. (Ayers)

The SMS needs to identify an Accountability Executive, as this person is ultimately responsible for airport safety, safety personnel, and airport activities. Once again, this needs to be a higher-level administrator, as they should have authority and responsibility for human resources, financial issues, and all airport activities. Many small airports must delegate this responsibility to the airport manager, or director, as they do not have the options available of a larger airport.

Depending on the size and complexity of the organization, the SMS Director may benefit from the support of a Safety Committee. It is highly recommended for airports with SMS to develop a Safety Committee. The safety committee should be comprised of personnel in all different areas of the airport, in order to receive proper review, suggestions, and representation. (Ayers)

Smaller airports may be best able to discuss and resolve safety matters in an informal way, instead of a formal establishment of a safety committee. As long as there is good communication, and staff and management are willing to provide advice and assistance to the director, a formal safety committee may be excess responsibility. At smaller airports that do not operate with a Safety Committee, Ludwig (2007) suggests that safety performance and safety management should be regular agenda items at general management meetings.

#### Airport Personnel Issues

The reason personnel are so important to the implementation, progress, and future success of the program, is that the SMS requires constant attention, and care from the

personnel involved. The right personnel start at the top-level of the organization, and then flow to everyone involved with airport safety. The correct personnel need to care, have the right attitude and goals that are concurrent with the overall goals of the airport. The SMS will be ineffective without the proper motivation, and constant monitoring. Airport management faces the decision of whether to hire new personnel, or to add the SMS responsibilities to current employees. Two major factors that will affect employees if airports are not able to hire SMS employees are employee workload, and generation gap of employees.

### Employee Workload

Employee workload presents many issues with employee performance and satisfaction. In a national representative study of 1,003 working adults, Galinsky (2001) found that seventeen percent of employees who are overworked make more mistakes, forty-three percent of workers felt anger towards their employers, and forty-nine percent of workers who were overworked were looking for other job opportunities. Galinsky's research also noted that overworking an employee could have many other detrimental effects, such as, loss of sleep, trouble with personal relationships, less likely to report health in good condition, a higher level of stress, and a lower ability to cope with everyday life events.

Aviation safety is an environment that requires the best performance, and abilities of those responsible for it. Overworking employees at small airports could create an environment, and personnel issues that would be detrimental to the overall safety of the airport, and the effectiveness of the SMS.

## Generational Issues

The implementation of SMS at smaller airports also presents workforce generation gaps and issues. Many small airports have employed personnel for many years and those employees have become accustomed to performing their duties in a specific way. These employees may be resistant to the overall change, as they feel that the previous safety culture was sufficient. The larger airports generally have many more employees, presenting a more diverse group that may be more open to accepting new policies and practices.

The generational gap can affect many areas in the work environment. Wheeler (2009) identifies many differences in the generations as they apply toward a work force. Older generations, prefer formalized training, with little interaction, while the younger generations prefer informal training with a lot of interaction. This causes many conflicts for management, as they would be in an environment of continual training for an SMS, especially during initial implementation.

The generational gap should be taken into consideration, however, Laff (2009) explains that generational differences are often due to personal interactions, and not necessarily work values and expectations. Laff's research suggests that the generational gap is merely a stereotype. Regardless, these issues will be present for all airports implementing SMS.

## CHAPTER III: PROCEDURES

### Participants

The participants for this study were selected at random. Three airport managers were interviewed, representing three different airports. Two of the interviewees have been involved with the second FAA SMS pilot study, and have developed plans to implement SMS. The third airport has not yet been involved with any FAA study regarding SMS, but is preparing for the change in regulation to require SMS.

### Population Sample

Nine airports participated in the FAA's second pilot study regarding SMS implementation. This paper focuses on two of the airports, representing twenty-two percent of the total participants. A third airport, which was not involved in the FAA studies, was included to provide comparative data.

### Methodology

Each participant manager was contacted directly for a personal interview. One interview was conducted face-to-face, one by phone, and one through electronic mail correspondence.

Detailed notes were taken from each interview, and then analyzed individually to determine if themes existed between the airports. The findings from each interview were compared to the expectations required for SMS implementation, and interpreted for the discussion section of this paper.

## CHAPTER IV: DATA AND CONCLUSIONS

This study attempted to address the following questions:

1. Do small airports intend to hire new employees to work specifically with SMS?
2. Would small airports hire additional personnel to work specifically with SMS, if funding were provided?
3. Whom will small airports assign the major responsibilities of the SMS plan?

### Hiring of Personnel

All three-airport managers interviewed stated that they had no plans of hiring new personnel to handle the additional duties required by SMS. The airport managers understand the work that is required, not only for SMS implementation, but also to maintain and build the system. Additional employees would be able to focus primarily on SMS, increasing the overall success of implementation.

One airport reported that they were concerned with the workload increase required by SMS. The airport director felt that they were already working with a minimum staff, and the increased duties would put undue stress onto an already overworked staff. This is why the all airport managers interviewed would ultimately hire personnel to work with solely with SMS.

All three airports identified budget concerns as their primary reason for not hiring additional personnel with initial implementation. One airport director said, "Logic tells us to hire someone specific to that role [SMS], but budget-wise that might not work".

(D. Hammon, personal communication, December 2, 2009) All three airports are currently operating on strict budgets, and do not have the funds available to pay another salary for this purpose. All three airports would hire additional staff to work specifically with SMS, if funds were available to do so.

#### Assignment of SMS Duties

The managers interviewed all agree that they will integrate parts of SMS into their safety system, even if the FAA decides not to require them to do so. These airports realize the benefits of SMS, and feel that the benefits outweigh the risks associated with employee workload. The initial implementation will increase workload, but with time, and as airport operators become familiar with the system, the SMS should operate effectively, and workload should decrease.

Since hiring new employees is not always feasible, these airports are finding ways to incorporate the responsibilities throughout their current staff. The three airports interviewed for this research all have unique organizational structures making it difficult for each airport to identify specific personnel to whom they would be assigning the major duties of the SMS.

The first airport is a small regional airport that operates with a limited staff. Their staff is already overworked, and management has concerns that they may over-saturate their staff, as they will be incorporating SMS duties into the duties of their current staff. This airport manager has yet to determine which employees would be responsible for specific SMS duties. (P. Dame, personal communication, November 23, 2009)

The second airport is a part of a general aviation community that collaborates with three other airports. The airport itself is small, but has many resources that are available through its partners. Through collaboration, they are hoping that they will not find a need for additional staff, as their wide range of resources should help them spread the responsibilities of SMS over many people. This airport manager is concerned with the additional duties, as this airport community has already cut more than 100 employees from its system. This has already added to the duties and stress levels per employee, even without the implementation of SMS. Their current situation inhibits their ability to distribute SMS duties at this time. (McNelly, personal communication, December 1, 2009)

The third airport operates as an owner, fixed-base operator, and FAR part 141 flight school. These additional departments incorporate different structures, needs, and available resources for SMS. These resources give this airport the means to distribute the responsibilities among their departments, who specialize in different areas of the airport's safety culture, although it is still unclear which responsibilities will lay within each department. (Hammon, personal communication)

An immediate concern, before implementation can begin, is the appointment of the SMS management team. The appointment of the SMS Director can potentially cause many conflicts of interest at these airports. The small airport environment limits the personnel who can be involved in this role without hiring new personnel. The SMS Director needs to be able to make decisions without influence from their other roles and responsibilities. The Director needs to be able to interpret data, make decisions based



solely in the interest of safety, and not with the influence of other departments and agendas. Independence may not be possible in smaller airports, but it is imperative that communication with top management and the SMS manager are open and fluid as possible. This is not always the case at a larger airport. Larger airports may already have departments in place to handle these responsibilities, as well as the additional personnel to take responsibility for the duties. Many of these positions, unless hired specifically, would usually fall within the operations department at some of the small airports. (Dame, personal communication)

The airports interviewed have mentioned that safety committees would also be a useful addition, although hard to assign, due to lack of available personnel. Two airport managers indicated that they would like to implement a safety committee; however, they are unaware at this time how the group would be composed.

## CHAPTER V: DISCUSSION AND RECOMMENDATIONS

It appears that the FAA will most likely mandate the use of SMS systems by all airports certified under FAR part 139. This presents many challenges to airports, but also many opportunities. Safety is the ultimate concern, and the drive toward a one hundred percent safety rate is a continual goal of all airports. SMS will aid in the ability to make the airport environment safer.

The personnel at airports that will be implementing SMS will face many challenges, especially at small airports. The size of the organization, and how airport management divides SMS duties among current employees, is a major concern. The additional responsibilities of personnel will prove to be a challenge; however, each manager interviewed for this study believes they will have to incorporate these responsibilities into the current employee's duties. Top-level airport management will have to address many issues with job responsibility, work saturation, and generational concerns to ensure proper implementation, and success of the SMS.

### Future Research

Further research is required in this area. As more airports implement SMS, more data will be available to small airports regarding the most effective means of implementation, assignment of SMS duties, proper organization, and correct policies and procedures that make SMS at small airports effective.

Further research should also identify how small airports delegate the SMS responsibilities. There are many options, and lack of options, that small airports face

regarding employee duties. How airports assign duties to current positions, including the SMS manager, SMS Accountability Executive, and safety committee members will be valuable knowledge. The future research should investigate how small airports have divided the SMS duties, and the most effective personnel who have been able to carry out the duties of SMS.

Future research should also study employee job satisfaction with SMS implemented at their airport. The changes to their responsibilities and additional workload may create an uncomfortable work environment, creating a threat to the overall safety culture at the airport. This will be important information for small airports in their decision to hire additional personnel.

Employee preparation is another area to focus on in future research. Employees will face many changes, and airports can handle the implementation in many ways. Understanding how airports prepare their employees for implementation, and how they manage their responsibilities during implementation, will be valuable information for small airports that may be required to implement SMS.

### Conclusion and Recommendations

Safety is the primary concern for airports, and the development of SMS and other safety programs can only move the industry towards their overall goals of improving airport safety. The personnel involved have a great influence on the overall safety culture of the airport, as they are responsible for maintaining a safe atmosphere, identifying hazards, and mitigating risks. Overall safety starts with having an effective, efficient system in place. Many things can influence these systems, but with the correct

implementation and distribution of workload, the right personnel can make any system effective.

Small airports will face many issues with initial SMS implementation. These airports will not be hiring personnel to work directly with SMS, so airport management must divide SMS duties among current employees. This will present many challenges to current employees as they adjust to their new duties. Airport management will need to identify personnel responsible for SMS duties, how they manage their responsibilities, and determine if there is a need for more personnel to effectively operate their SMS.

This research recommends that airports be knowledgeable about how SMS implementation may affect their employee's abilities to carry out the functions of their current positions, along with the duties of SMS. Airports need to consider the effects that SMS implementation will have on their personnel. This is a new area, and contains many new ideas. Although the recommendations of this research, and from airport managers, are to hire specific personnel, time will show whether this is necessary.

Research will continue as more airports are adapting SMS programs, and follow up research will be able to identify effective strategies, and efficient organizational structures at small airports. The next few years of SMS implementation will be critical in identifying how personnel prepare for implementation, and adjust to the changes from their current system. As the implementation occurs, the industry will be able to see the effects and determine if specific personnel are required to operate SMS.

The FAA and airport management will need to monitor how airport employees handle their additional duties. If they find that current personnel are unable to operate effectively within the SMS, the FAA must work with airports to provide funding opportunities for airports to hire SMS personnel.

Future research will be the most important factor for improving SMS implementation. The FAA and airports need to identify proper procedures for implementation, identify how small airports can effectively operate with their current staff, and identify who should be responsible for the major duties required by SMS.

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