

## A Brief Look at Airport Safety Management Systems

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An airfield maintenance truck accidentally transgresses an active runway and causes a runway incursion. Although there is no actual collision between the truck and an aircraft on short final (that is forced to go around), the event is something that the pilots, maintenance crew, and air traffic controllers will not soon forget. The cause of the transgression is due to the inability of the maintenance crew to hear the tower's last minute hold short instructions because the volume on their radio was turned down. Even though this event was fictitious, I am sure all airport managers can identify with real, similar experiences. More on this example shortly.

Your SMS consists of four major components (also known as the Four Pillars of Safety). These are: a) safety policy, b) safety risk management, c) safety assurance and internal evaluation, and d) safety promotion. Within each of these major categories there are subcategories. Your SMS manual will become your bible of safety where these components and subcomponents will be spelled out in detail. A good SMS manual should be a "one stop shop" where anyone can look up your airport's safety processes, procedures, and accountable individuals. Let's expound a bit on these Four Pillars of Safety.

***Safety Policy-*** When we speak of policy, we are generally concerned with the structure and outline of how safe operations will be conducted. Among other things, it involves planning, organizing, compliance with regulations and law, documentation, and emergency preparedness and response. It is at this level that upper-level management must buy-in and continuously

support the SMS. Without management buy-in and support, the SMS is bound to fail. Employees are highly influenced by management behavior examples, and therefore if employees see management intentionally breaking rules or ignoring policy, it is likely the employees will emulate this behavior.

***Safety Risk Management-*** Possibly the most important component of the SMS, safety risk management is the process by which risks are identified, mitigated, or eliminated before they become a visible (surfaced) accident or incident. This is a proactive approach to error prevention and mitigation which is a paradigm shift from the reactive approach that has been used in the past.

Risk can be thought of as the consequence of a hazard, and is measured in terms of severity and probability. You will develop a Preliminary Hazard Analysis that will serve to identify the hazards that exist at your airport. Hazard identification can be accomplished by a variety of methods that include observations, audits, safety surveys, investigations, and research. Other sources can include factual briefings from frontline personnel, subject matter experts, brainstorming, and analysis tools such as event trees, fault trees, FMECAs, and so on. Once the hazards are identified, you will then need to analyze the data to see what type of controls may need to be put in place. Risks that have a high severity and high likelihood rating would be the ones you want to address as a priority. On the other hand, risks that have a low severity rating and a low likelihood of occurrence may be classified as acceptable risks that you can just live with.

***Safety Assurance and Internal Evaluation-*** The well-known Heinrich Ratio states that, for every fatal accident, there will be three to five nonfatal accidents and 10 to 15 incidents; but there will also be *hundreds* of unreported occurrences. Unreported occurrences are extremely problematic since no defenses can be employed if nobody knows these occurrences exist.

There are quite a few subcomponents in this category, one of the most important being error reporting; however, an error reporting system may be the most challenging component to implement due to peoples' natural propensity to deny they make mistakes in the first place, as well as their fear of retribution or punishment for disclosing such mistakes. This can create a "darned if you do, darned if you don't" mindset. From a personal standpoint, employees may feel that while there are clear advantages to error reporting, at the same time they might also feel that the embarrassment and potential punitive implications far outweigh the advantages. Yet, a good and effective safety culture must include an error reporting system. In order to attain this goal you will need to ensure that your airport promotes a *Just Culture*. A Just Culture is a culture that acknowledges that well-intentioned people still make mistakes and should not be punished for slips, lapses, mistakes, and other common everyday errors. Yet, a line is still drawn where willful violations and purposeful unsafe acts will be dealt with in punitive form. The general indications are that only around 10 percent of actions contributing to bad events are judged as culpable (Reason, 2004, as cited in Global Aviation Information Network, 2004, p. vi). The bottom line of a Just Culture is *trust*. Employees must know that they can report errors without sanction. Once this trust is established, then an organization can have a reporting culture, something that provides the system with an accessible memory, which, in turn, is the essential underpinning to a learning culture (p. vi). Along the same lines, Eiff (1999) suggests that, "An effective and

systematic reporting system is the keystone to identifying the weakness and vulnerability of safety management before an accident occurs. The willingness and ability of an organization to proactively learn and adapt its operations based on incidents and near misses before an accident occurs is critical to improving safety.”

***Safety Promotion-*** Subcomponents of this category include the development and continuous nurturing of a healthy safety culture, communication, training, and feedback for lessons learned. The most important point about safety promotion is that there needs to be an ongoing, palpable presence to the SMS. This requires open communication between management and employees without fear of retribution, feedback offered on a regular basis, and appropriate employee training on the SMS.

Now that you have a basic understanding of the components of an SMS, let’s revisit the fictitious runway incursion at the beginning of this article. I pose to you a few questions based on the Four Pillars of Safety that were previously discussed: First, how could *safety policy* have prevented the transgression? Second, how could *safety risk management* have prevented the transgression? Third, how could *safety assurance and internal evaluation* have prevented the transgression? Fourth, what type of *safety promotion actions* may have precluded the transgression? These are abstract questions that allow you to think about accidents and incidents within the Four Pillars of an SMS. This is what the SMS is all about!

This has been a very fundamental look at SMS for airports. It is not just a good idea and one that has already been embraced in other parts of the world, but it is already a regulatory requirement

for Part 139 certificated airports in the United States. Keep in mind that an SMS is not a one-size-fits-all program. What works for a large capacity airport might be overkill for a smaller regional airport. Conversely, what works for a regional airport may fall short of the requirements for a major airport. Implementation of your SMS will take time; depending on the size of your airport, it can be anywhere from a few months to a few years. It is not something that can be developed overnight and be hailed as a magic bullet. It also needs to be supported at all levels of the organization and modified over time as situations (and risks) change. The bottom line is that an SMS is a proactive approach to safety and it must be viewed as a living system.

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