EVALUATING SAFETY MANAGEMENT SYSTEM IMPLEMENTATION

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ABSTRACT

Canada is committed to not only maintaining, but also improving upon our record of having one of the safest aviation systems in the world [1]. The development, implementation and maintenance of safety management systems is a significant step towards improving safety performance. Canada is considered a world leader in this area and we are fully engaged in implementation. By integrating risk management systems and business practices, the aviation industry stands to gain better safety performance with less regulatory intervention. These are important steps towards improving safety and enhancing the public's confidence in the safety of Canada's aviation system.

1.   Introduction

Aviation accident statistics in recent years show an overall downward trend, but the rate curves are almost flat [2]. Dramatic industry growth put tremendous pressure on the domestic and international systems and while the economic downturn has temporarily eased this pressure somewhat there is little doubt that this is a short term situation. While growth normally brings economic success, it also brings with it many challenges and increased risk to safe operations as delivery and regulatory oversight systems come under stress.

To meet this challenge, different ways to improve aviation safety are required to reduce the rate of accidents. This involves building upon existing regulatory frameworks and focusing on risk management practices. This builds on the work by leading safety experts and international bodies, who have been advocating that greater attention be paid to aviation safety at the human and organizational factors level.

Implementing safety management systems (SMS) in aviation represents a cultural change that strengthens partnerships with industry, allows a more efficient use of resources and sets the stage to meet the safety challenges of the future. The effectiveness of this approach can only be optimized through a strong regulator/industry partnership. The Canadian aviation journey began in full consultation with and the strong support of industry partners and Canada continues to support other regulatory authorities as they develop their SMS regulatory regimes.

This paper will describe the civil aviation experience to date with SMS implementation including best practices and lessons learned specifically in the areas of regulatory development and oversight, company management and policy development, as well as the importance of the data collected from implementing a safety management system for the future of aviation safety.

2.   Regulatory Development

The International Civil Aviation Organization has developed standards and recommended practices as guidance for member states to establish an SMS regulatory framework [3].

In Canada, SMS regulations for airlines and aircraft maintenance organizations providing service to airlines became law in June 2005 and regulations for airports and air navigation service providers became law in December 2007 [4]. Other parts of the industry will be required to implement an SMS appropriate for the size and complexity of the organization

over the coming years. Transport Canada is taking a phased approach to implementation. Larger organizations must put the regulatory changes in place within three years meeting process milestones along the way.

The requirement for an SMS sits on top of everything – as an umbrella – in addition to the current regulatory framework. It is actually an additional layer of safety to enhance the work Transport Canada continues to do through its oversight program.

The Canadian Aviation Regulations (CARs) define an SMS as a documented process for managing risks that integrates operations and technical systems with the management of financial and human resources [5]. Relatively speaking, this is a fairly simple process involving the implementation and adoption of components and elements (infrastructure) to reduce human error and establish a system-based approach to managing risk, which means the early and pro-active identification of hazards and their effective mitigation or elimination. Sustaining the risk management system's effectiveness is much more complex. The key to sustainability is incorporating continuous improvement into all aspects of operations and viewing this approach to risk management as an opportunity to continuously improve rather than a journey with an end point. It requires a change in management culture.

Involving the industry at the outset has proven to be one of the keys to successful regulatory development. It is also important to note that subsequent regulatory development for other sectors has taken much less time and involved less debate because of the early involvement of the larger civil aviation sectors. The development of guidance material to assist is also an important step towards successful implementation. The material developed is constantly reviewed and kept up to date as implementation proceeds.

3.   Accountability

A key requirement of an effective SMS implementation is well-defined accountabilities both inside the regulatory authority, inside the regulated enterprise, and between the regulatory authority and the partnering industry enterprise. An appropriate accountability framework is critical to the effective implementation of safety management systems. It is important to understand where the accountability for safety performance resides within a company and how those accountable relate to the regulator.

The aviation regulations require airlines to appoint executives who are accountable for the safety performance of the enterprise, and responsible for establishing and maintaining the over all risk management framework and its supporting safety culture. With leadership from the top instilling more accountability and a positive safety culture, management and employees can continuously work to enhance safety performance by identifying and overcoming potential safety hazards before they become occurrences. Cultural change requires a sustained effort and focus over a long period of time, and this has to be generated by senior management.

The regulations also require that the accountable executive provide department heads with the necessary resources to comply with the regulations as well as maintain the necessary levels of safety performance. The individuals who occupy these positions must understand the SMS and be able to promote it in order to develop a culture that will support and foster effective risk management. Developing this infrastructure changes the approach to sustaining and

improving safety performance by defining the requirements for a reporting culture within the organization.

The aviation experience to date shows that where the accountable executive has fully accepted his accountabilities and has highlighted SMS as the way of doing business, implementation has been more effective. Specifically, the cultural transition, to a state where all decision-making takes into consideration the impact on safety performance of that decision, has been more readily apparent.

4.   Enforcement

The role of enforcement in the safety oversight framework is evolving as SMS implementation continues. In addition to the development of a clear accountability framework, the promulgation of a proactive enforcement policy is critical to the development of a reporting culture, which is an essential requirement for the development and implementation of an SMS. However, to be effective, it must be universally applied and clearly understood by everyone in the organization and in the regulatory authority. This requires a cultural change in the industry and in the authority.

The aim of the enforcement policy is to provide operators the opportunity to detect and to determine, by themselves, proposed corrective measures to prevent recurrence of a contravention, as well as the best course of action to help foster future compliance. It provides a means of promoting voluntary compliance with regulatory requirements, without necessarily resorting to punitive action. It is a balanced and progressive policy to promote aviation safety, which aims to encourage a blame free reporting and operating environment.

If the industry is willing and able to identify and address safety hazards, and in this context a non-compliance with a regulation is a hazard to safety, then the authority must have the patience to let the industry attempt to deal with the issues and, only if they fail, step in with enforcement action. This policy approach, of course, does not apply where we are dealing with willful non-compliance or criminal activity. This approach is entirely consistent with the SMS requirement that fundamental activities in the risk management framework are processes that assure the airline is in compliance with all applicable regulations and standards. The assumption is that a non-compliance is a safety hazard that the operator must address in its SMS.

One of key lessons learned from operators is that involving employees and their representatives in the development of policies encourages buy-in and demonstrates that management is interested in the concerns and needs of their employees. This approach fosters a collaborative relationship based on a clear understanding of the SMS goals and objectives. Experience has shown that without appropriate policies, voluntary reporting of hazards is severely curtailed and developing an effective reporting culture virtually impossible. However, if the policy provides appropriate protections to reporters who voluntarily submit reports, the system will reach its full potential.

5.   Data

SMS implementation will likely generate a 400 to 500 percent increase in the number of reports. Also, it is expected that initially the number of statutory reports, (occurrences required by law to be reported which report damage or injury) will increase as an SMS

becomes more effective because operators will be reporting more at the minor occurrence end of the spectrum before the hazard grows and is manifested in a major occurrence report. In a short period of time, within 18 months, there should also be a significant decrease in the number of occurrence reports even though the numbers of reports remains high. This result is a subtlety that should not be misinterpreted to mean safety performance in the industry has diminished when it is actually an indication of increased safety performance. This data will become very important for conducting business in the future. Ensuring that the information continues to be generated is critical to the optimization of the safety benefits of SMS.

It is essential that this data be interpreted and used properly by the industry, the regulatory authority, the justice system, the media and the public. This means that individuals need protection from prosecution for making mistakes. Inside companies this protection is found in the company's punishment policy, which has the sole purpose of creating a blame-free reporting environment to create a reporting culture. Inside government, this means the development of reporting cultures and systems within the authority and the creation of legal protections where appropriate. Aviation authorities must also create strong partnerships with the industry to get the message out that protection for information at the reporting level, as opposed to the level where the data has been de-identified, is essential to improve the safety performance of the industry.

A cooperative relationship between management and employees is a positive sign that the safety reporting culture is being formed – a culture that is non-punitive, supported by senior management and based on just principles. Reports must be followed up on and corrective actions identified where required or reasons provided where there is no corrective action. In either case, employees need to know that reporting is worthwhile – that there is an obvious benefit to all in reporting.

6.   Oversight

The regulatory framework contains both prescriptive and performance-based regulations and our SMS regulatory framework is predominantly performance-based. The SMS regulations not only prescribe what an SMS must be, but also demand that these systems perform effectively. This has led us to develop an oversight approach that combines both compliance based inspections and audits to determine if the service provider meets the prescribed requirements and performance-base inspections and assessments to determine if the service provider's SMS and sub-systems perform effectively.

Under this new approach, Transport Canada is assessing safety performance by evaluating systems that operators put in place to ensure that employees are following procedures, that there is compliance with regulations, that aircraft and aviation infrastructure are properly maintained, and that safety practices and procedures remain among the best in the world.

The new assessment process for evaluating an SMS focuses on the effectiveness of the system and makes judgments on performance. With this change, the focus shifts to reflect more involvement with senior management. The tool is more oriented towards outputs and outcomes and questioning relates to the effectiveness of the process rather than using a checklist to determine if a given process is being followed. The process is defined by component and the elements that comprise that component, for example a reactive reporting process. Components will be evaluated according to the timetable for implementation and once an SMS is fully implemented a periodic evaluation will be conducted.

The advantage of this approach is significant in that it not only addresses the need for service providers to have a high level of regulatory compliance, but also it ensures that their SMSs are effective in improving the provider's overall safety performance. The oversight system clearly shows how an SMS regulatory framework, that demands that SMSs be effective, and an oversight system that inspects for system effectiveness, has the highest probability of improving the safety performance of service providers.

7.   Conclusion

A decade has passed since Transport Canada began the process of regulating safety management systems for aviation organizations. It was much more complex than first imagined, especially changing the culture. We've come to learn that the key to successful implementation is viewing this approach as an opportunity to continuously improve rather than a journey with an end point.

The transition to SMS has been successful to date. Regulatory requirements are being met and safety performance of the aviation industry continues to improve. Our goal is to create an environment in civil aviation that provides for strict performance-based regulation and the avoidance of human errors that can lead to accidents farther down the line.

No other civil aviation authority in the world has implemented SMS to the extent that we have in Canada. We are leading the world in the area of SMS implementation and are considered a model for other authorities to follow.

We firmly believe that SMS will save lives. Based on the results so far, we have every reason to believe that the end result will be more impressive than we originally thought.

References:

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