

# **SAFETY MANAGEMENT SYSTEMS**

David Mawdsley  
Aviation Safety Advisor  
Superstructure Group Limited

**Paper presented to the**

**61<sup>st</sup> Annual International Air Safety Seminar (IASS)  
A Joint Meeting of Flight Safety Foundation, International Federation of Airworthiness and  
International Air Transport Association**

**Honolulu, Hawaii**

**October 27-30, 2008**

Copyright © 2008 by Superstructure Group Limited

## **Background**

Aviation safety management has experienced great change over the past two decades. From its former negatively orientated, reactive approach which relied on accidents and incidents to let the organization know where threats existed it has moved to a systems approach. Risk assessment and management concepts have now been adopted. Operational Safety has teamed up with Quality Assurance and unleashed the power of data and process to address systems errors. This requires that organizational management, not just the safety officer, take responsibility for the company's safety program with clear accountabilities for safety mapped out across the organization. The system must be fully documented with clear performance criteria established. With these components in the early 1990s, SMS was born.

The introduction of SMS has already brought many benefits, not only in terms of safety but it has given greater clarity to air transport organisations and resulted in enhanced operational efficiency. But SMS implementation is proving to be a tougher road than expected and it is not without controversy. ICAO has estimated that only about 10 percent of all airlines world wide had "a reasonably implemented SMS". This assessment was made against the expectation that airlines and maintenance organisations would have an SMS in place by 1 January 2009.

Recently in the United States and in Canada some of the underlying concepts of Safety Management have been challenged by politicians and the general media making the installation of SMS in the various enterprises all the more challenging for aviation leaders.

## **The SMS Performance Expectation**

Safety is a performance expectation. SMS must have targets and metrics against which performance can be measured. In the United States the Sarbanes-Oxley and Basel 11 rulings have reinforced corporate officer accountability for both financial and operational results along with accurate reporting to investors. An even more stringent performance bottom line is the UK's new Corporate Manslaughter and Corporate Homicide Bill which took effect on 6 April 2008. It supersedes a statute that tasked juries to consider if corporate actions were 'so negligent as to be criminal'. The new law penetrates further and questions whether the conduct of management 'falls far below what could reasonably have been expected'. This sends a clear message. When it comes to safety management and practices in the UK no company can afford to be below average in SMS performance. This is a message with global applicability.

## **SMS Requirements**

There is no excuse for not knowing what is prescribed for States and service providers in terms of SMS requirements. This has been set out in the ICAO Safety Management Manual Document 9859 issued in 2006 and in SMS documentation produced by leading Regulatory Authorities. Whether the word "should" or "shall" is used to communicate the need to have an SMS in place, there is undoubtedly a strong expectation amongst the regulators of the world that 2009 will be a year for implementing SMS and the pressure is on.

Leading airlines point to SMS being a simple concept and urge that it is not allowed to lose its way in a world of rigid regulatory requirements. Managing safety ultimately comes down to managing risk. There are very few airlines that do not manage their safety risk. Most already have an SMS or at least the principal elements of an operational risk management system in place. There is a natural tendency to point to the gaps when the pressure comes on to implement and the associated organisational changes can become very negative and complicated all too quickly.

## Implementation

To provide guidance on SMS implementation IATA has issued two documents, the first of these in 2005 entitled: "Safety Management Systems – the Senior Airline Manager's Implementation Guide". The second guide was released in 2007 and entitled "Integrated Airline Management System for air Transport Operations". The latter work, which is rather ahead of its time, employs an interactive toolkit which advances the "integrated" management system approach applied by IOSA. This embraces not only SMS but Risk, Quality, Security and Supplier management thinking. Some excellent guidance material has also been released by the leading Regulatory authorities including the Transport Canada, the UK CAA, the Australian CAA and the FAA. Overall however it is the experience of actually installing and resourcing SMS which is still rather limited and where there is perhaps scope for further guidance.

IATA has helped further to improve the performance of SMS around the world by "mandating" IOSA for all of its 260 airlines. Unfortunately, IOSA is seen too often in a rather narrow code share auditing context. There is a case for IOSA being recognised more widely by the establishment as the global standard in airline operational safety which complements the ICAO Universal Safety Oversight Auditing Program (USOAP) applied to States. After all, in practice the airline industry, is mainly regarding IOSA as such, including an increasing number of regulators. The IAC could therefore help to promote IOSA in a wider context as the global auditing standard for airlines and in doing so help to enhance SMS performance.

## Integration

With implementation comes the need to integrate. An air carrier organization is composed of a "system of systems" which are integrated and intra-supportive. Airlines and their supporting enterprises will not only be expected to "implement" SMS but they will need to ensure that it is "integrated" with the various cultures in their operations and support areas. Here a phased approach is crucial to successful implementation and integration. The plans and integration templates of others should be used with caution. They are potentially helpful to look forward to assess where, for example, integration of data management systems may best be applied but it is for the organisation to decide which components of an integrated SMS should have priority for introduction, and always with aim of keeping it simple. The key SMS implementation and integration requirements are: keep it simple; build on that which is already in place; phase the implementation; choose the right software tools for integration; support the changes with strong corporate communication; and lead the whole process with guiding actions from the top.

## Challenges to the SMS Fundamentals

There are some challenges impacting at the very core of SMS beginning with the preservation of the life blood of an SMS - its data. A lack of proper reporting and release of data may be the single greatest obstacle to implementation of SMS. The key to effective SMS is a generative safety culture employing a voluntary employee reporting system which analyzes data and shares information. The process of unlocking the value in the data and turning it into useful information is largely achieved by having the right tools and the expertise. Today's powerful data management systems enable the risk exposure to be mitigated not only in the operational safety arena but across the aviation enterprise as a whole. Such data-driven integration is vital to the implementation of an SMS. It reduces complexity, crosses organizational boundaries, improves business efficiency, reduces costs, and saves lives.

Safety reporting systems however remain vulnerable on a number of fronts. A recent case in the U.S., for example, involved a plaintiff's use of a confidential voluntary report to cite lack of action by management on a serious safety matter. Whether or not such rulings, could discourage reporting by front line operators remains to be seen but in a world of strict compliance any negative reaction by company executives to limit their liability by discouraging the use of voluntary reporting systems would represent be a dreadful step

backwards. The message must be that the only true way to limit liability is to manage safety in an open and effective manner.

Another recent test of the system has come with an airline being fined for failing to comply with an airworthiness directive, a failure the airline reported. This drew into question the safety culture which spans the close relationship between the regulators and the regulated, the one which is so vital to the successful installation of an SMS. For as it stands the underlying concepts of SMS – voluntary reporting, risk management and collaboration – could be misconstrued as weak and ineffective safety regulation. The technical sophistication of SMS could be its own worst enemy in being difficult to digest politically and by the general media. There is certainly plenty of scope for a return to pedestrian solutions rather than pressing forward with the co-operative systems which have achieved such success.

Take as another example the situation in Canada where SMS is probably more mature than anywhere else in the world. There Canadian Labour organisations and politicians have expressed scepticism about the motives of SMS urging a return to an inspection based system seeking to ensure safety through enforcement. According to the Auditor General, Transport Canada has taken its eye off the ball and reduced safety oversight of the industry during the 3-year transition to SMS. This draws into sharp focus the issue of balancing resources with other safety functions during the SMS transition but the threat of an overreaction and a return to the thinking of the 1980s is very real.

This latest round of challenges to SMS fundamentals provides an opportunity for FSF as an independent, neutral voice of aviation safety, supported by the IAC, to use its influence and remarkable communication skills to help the public and their politicians see the merits of SMS. Most importantly, the message must be pitched in language that these key players are likely to understand.

## **Leadership**

At a time when there is major concern in the industry about managing operational complexity, SMS implementation is very much a leadership challenge. Airlines are recognizing that the great benefits of SMS are at risk of being rejected or delayed by the confusion and frustration arising from the contrasts between the many abstract descriptions of SMS and practical implementation. If enterprises are not to be overwhelmed by the plethora of SMS policy and guidance, leaders at the sharp end from the CEO down must themselves make the time to understand the way in which SMS is being implemented in their organization. It is for the leaders to execute this change employing the very best communication techniques and demonstrating a clear commitment to the SMS implementation plan. One of the most pointed actions a CEO can take to advance safety is to preside over the operations “top” meetings in safety. This ensures that everyone in the company knows that SMS is considered a vital part of the business. This top-down approach is already in place in some airlines represented on the IAC.

## **The Roadmap for SMS**

Leadership in SMS on a global scale is also vital. The principle milestones for aviation safety from hereon have been described by key industry stakeholders, one of which is FSF, in the recently published Global Aviation Safety Roadmap – “the Roadmap” that is now enshrined in ICAO’s strategic action plan for safety. The Roadmap calls for a new regulator/service provider partnership aimed at reducing the global accident risk in commercial aviation. Amongst its twelve focus areas spanning the whole spectrum of aviation safety there are key “roads” focusing on SMS and the reporting and analysis of errors and incidents.

Most significantly, the Roadmap calls for greater integration of safety management systems not only within the airline and service provider enterprises but interface points must be defined between industry focus areas. Therefore, the message for the future of SMS implementation is very much one of “silo busting” the various professional cultures contributing to accident prevention and to integrate them on a basis of equal partnership in what will always be a war of attrition in risk mitigation.