



*SMS IMPLEMENTATION AT AIRPORTS
OUTSIDE THE UNITED STATES*

SMS Implementation at Airports Outside the United States

Interview Summaries





FOREWORD

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Staff Officer
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The interview summaries contained in *SMS Implementation at Airports Outside the United States* was developed out of research conducted during in the development of *ACRP Report 1, Volume 1: Overview of Safety Management Systems for Airports*. The summaries consist of notes that were compiled through interviews with foreign airport officials and civil aviation authority personnel who are involved in the implementation of safety management systems (SMS) in their organization. They describe experiences and lessons learned during the SMS adoption at airports outside the United States and may be useful to executives within the United States who are planning to implement SMS in their organization.

The MITRE Corporation's Center for Advanced Aviation System Development (CAASD) conducted the interviews and prepared the summaries during development of the SMS Overview for TRB under ACRP Project 11-02/Task 4. CAASD has a long history in aviation safety-related projects and has provided support to both the FAA and international aviation organizations in SMS development and implementation.



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Safety Management System Implementation at Airports Outside the United States

Introduction

The summaries in this document were compiled through interviews conducted in early 2007 with airport officials and others who have had a role in implementing Safety Management Systems (SMS) in their organizations. These notes describing the SMS adoption process at airports outside the United States may be useful to executives planning a similar system safety overhaul.

The interviewees represented the operators of airports, a foreign Civil Aviation Authority (CAA) (CAAs are the foreign equivalent of the Federal Aviation Administration (FAA)), or International Civil Aviation Organization (ICAO).

Questions for airport officials:

- n How was SMS implemented at your airport? Was a phased approach used? What milestones were developed and actually worked?
- n Is your airport's safety reporting system data available to your CAA?
- n What results (if any) can your airport show, now that SMS is implemented?
- n What lessons has your airport learned that could help other airports implement SMS?
- n What benefits have been observed at your airport due to SMS so far?

Questions CAA representatives were asked included:

- n What is the status of SMS legislation in your country?
- n What data is your CAA tracking on a national basis from airports regarding hazards, for example?
- n Describe the Confidential Reporting System in place in your country.

Questions asked of the ICAO representative included:

- n What is the status of SMS airports' legislation implementation by States in your region? What levels of airports are affected?
- n What lessons have airports in your region learned that could help US airports implement SMS?

The interviews identify numerous aspects of SMS implementation in the global aviation community that require further discussion. SMS has the potential to greatly improve the



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level of safety at an airport, but it is not without its challenges. One such philosophy is:
"If you've seen one airport, you've seen *one* airport."



Interviews with Airport Operators

Calgary International Airport



January 2007
Paul Van den Eynden
Director, Safety Management Systems
Calgary Airport Authority, Canada

1) What is the status of SMS legislation implementation by Transport Canada for Canadian airports?

As of December 2006, SMS was not yet legislated at Canadian airports, but will be in 2007. However, the majority of the new legislation is already projected/identified.

2) How was SMS implemented at Calgary? Was a phased approach used? What milestones were developed and actually worked?

In 2000, Calgary Airport Authority (CAA), in cooperation with the airport community, saw a need to improve airport safety—due to increasing apron incidents, accidents and near misses, as well as major construction projects

CAA was aware that SMS (on the airside) would eventually be regulated by Transport Canada (TC). Using SMS principles, CAA took several proactive steps to improve its safety:

- n In 2000, implemented Apron Safety Procedures (developed in cooperation with the airport community) and did a complete overhaul of the Airside Traffic Directives.
- n In 2004, identified need for a funded Safety Management Systems position.
- n In 2005, created position of Project Manager SMS Implementation, which in 2006 became Director, Safety Management Systems (the Director is part of the Management Council).
- n As of 2005, the SMS Steering Committee (comprised of the CEO, Vice-Presidents and senior directors) met quarterly, and as of 2006, it met monthly. The Steering Committee is chaired by the Director, SMS.
- n In August 2005, established a Maneuvering Area Safety Team (MAST) based on the Runway Safety Teams identified in the European Action Plan for the Prevention of Runway Incursions (Eurocontrol). This Team meets quarterly.
- n Evaluated Calgary International Airport safety using a broader scope than what was anticipated to be regulated by TC under SMS. Using a comprehensive safety approach, evaluated ways to improve both airside and landside aspects of safety. Drafted a five year work plan including all aspects of safety (e.g. workplace,



construction, airport, maneuvering area, emergency preparedness, specific safety and emergency preparedness training, audits, gap analysis, etc.).

- n Drafted a set of safety initiatives—specifically, Apron Safety Procedures (see above).
- n Currently holds monthly Airport Safety Committee meetings, performs quarterly foreign object debris walks and semi-annual baggage hall (claim) audits, all in cooperation with the airport community.

Calgary International Airport going forward:

- n CAA funding a Safety Compliance Officer position in third quarter of 2006, carried over into 2007.
- n Job involves monitoring and enforcement of directives for both airside and landside.

3) What results (if any) can Calgary International Airport show, now that SMS is implemented?

Calgary International Airport's results:

- n Improved airport community staff's safety awareness.
- n Enhanced airport community staff safety culture.
- n Drop of more than 70 percent in incidents, accidents and near misses between 2001 (134) and 2006 (34 as of the end of November 2006).

4) What lessons has Calgary International Airport learned that could help other airports implement SMS?

- n Do not wait till legislation is in place - Act now.
- n Ideally, some (or most) of what you have in place today can be used in an SMS framework.
- n Documentation is the key component to ensure/demonstrate an airport's due diligence requirements.
- n Tackle SMS in stages, don't try to do everything at once (the British Airports Authority (BAA) has been working on this for more than 10 years).
- n If not already done, establish and maintain a good working relationship with your partners and members of the airport community (and this includes the regulator).

Remember the following:

- n The true value of safety is demonstrated by its absence.
- n Safety is not a vague concept. It is who we are and what we do.

5) What is your role as Director, Safety Management Systems?



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The Director, SMS, is responsible for the implementation of the Transport Canada regulated portion of SMS. In addition, he is responsible for all aspects of safety at the Calgary International Airport.



Calgary International Airport



Cardiff International Airport



January 2007
Graeme Gamble
Operations Director
Cardiff International Airport, Wales¹

1) How was SMS implemented at Cardiff? Was a phased approach used? What milestones were developed and actually worked?

SMS was developed over several years at Cardiff International Airport in a more evolutionary, than formal phased approach. Between 1994 and 1999, the TBI Group of airports including Cardiff, Belfast International, and London Luton Airports identified and shared each others' best practices. The UKCAA gave UK airports SMS guidance over the past 10 years.

2) What did not work?

CBT Training

In July 2002, Cardiff International Airport introduced computer-based training (CBT) to train airport staff on such topics as: Runway Inspection Procedures, Driving, Low Visibility Procedures. One of the key benefits of CBT was to minimize classroom time, especially during peak seasons when many new recruits joined the airport.

Initially the CBT method was thought to be a great teaching method; it also did not take much management time and it provided employee training standardization. However, over two or three years through Airport training surveys, it was learned that the airport staff didn't like CBT method (the students wanted more personalized training) but, more importantly, that CBT didn't meet the needs of the students. Incidents began happening on airfield that were actually attributed to CBT training method.

For example, take Runway Crossing. In the CBT Training package, the student was taught that to cross the runway they needed a traffic light to change from red to green, and they needed verbal permission from ATC. The CBT method taught this information but didn't re-enforce both items sufficiently and emphasize that both were mandatory for permission to cross a runway. This was a result of the fact that although the CBT Training material was reviewed every 12 months, it didn't give current examples of non-compliance that would instruct the student to get both. Due to this feedback, Cardiff Safety Management is going to be supplementing CBT training with "presentation type" training—allowing the student to have question and answer time with the instructor.

¹ Graeme Gamble joined Cardiff International Airport as Operations Director on 1 July 2002.



Personality

Personality plays a role in SMS. Local management is key, if you have a strong supervisor; things go very well, if you have a weak manager, then you may have a problem.

3) What results (if any) can Cardiff show, now that SMS is implemented?

Reduced Runway Incursions

In 2004, Cardiff's runway incursion (RI) rates suddenly increased. Cardiff International Airport was reported as having the second highest number of RI in UK, primarily due to better RI reporting. UK NATS (UK National Air Traffic Services) had developed more robust RI reporting systems. Subsequently, Cardiff International Airport started to work closer with NATS, and in early January 2007 during a major UKCAA Audit, Cardiff International Airport and NATS rolled out Joint SMS document. This Joint SMS Manual was the result of 15 months work. Integrated SMS was driven at the highest level by the NATS Chief Executive who set very high safety targets. NATS recognized, as the key Safety Supplier on the airfield, in order for them to achieve the high safety target required, all organizations on airfield had to be safe. Each organization had a separate SMS system and they were not using a coordinated approach to SMS. NATS and Cardiff Airport saw the need for a single document—a Joint SMS approach which has an integrated framework.

There is still more work to do. The joint SMS document is a dynamic document, both NATS' and Cardiff Airports' SMS systems work well, but they can be improved.

As a result, and directly in correlation with the Joint SMS, there are fewer RI and their severity is minor.

What is the difference between the Runway Safety Team approach used in Europe and the U.S. and the Joint Airport/ATC SMS approach implemented at Cardiff?

It is broader scope than just Runway Safety. For example, previously when an airport staff found a problem on the airfield, he or she would simply call NATS to notify them and then take action based on their own dynamic risk assessment of the situation. This method introduced some safety risk. Now a more comprehensive review of what needs to be done to resolve the problem is used: Where is the hole in taxiway located? What are the current weather and forecast conditions? Are there low visibility conditions? Does fire service need access to this area? What is the lighting situation? The new Joint process is a more formalized process than before.

Other changes using the new Joint process are more formalized monthly meeting minutes with standing agendas that allow action to be recorded.



4) What lessons has Cardiff learned that could help other airports implement SMS?

Document Control

Documentation is a key area, have a mechanism to record when documents are received, and use numbered copies. When procedures are changed at short notice, document control allows everyone to know what is going on and have a record that everyone has received the new information.

Self- and Third-Party Audits

It is essential to audit and test procedures and training methodologies on a regular and periodic basis to ensure that they are current and effective. Having carried out safety surveys of end-users, Cardiff Airport was made aware of deficiencies with computer based training packages and resolved prior to an incident developing.

Executive-Level SMS Training

Ensure the Chief Executive understands the risk of not having an SMS. An example is the Ladbroke Grove train disaster in the UK in the late 1999. 31 people were killed and many were injured. Senior managers within Railtrack were heavily criticized by Lord Cullen who conducted the inquiry; he noted the “Lamentable failures of SMS at highest level”. The person at the top effectively failed to ensure SMS was in place. The CEO is responsible for Safety.

5) What is your role as an Operations Director?

Overall, the role of the Operations Director is to ensure that the safety of Cardiff Airport’s operations are given the highest priority. He is responsible to provide a safe and secure Aerodrome, a robust SMS, and, as Cardiff Airport’s operations grow and change, that it remains a safe airport.



Cardiff International Airport²

² Image Source: Jane’s Information Group.



Copenhagen Airport



February 2007
Thomas Lau Christensen
Safety Manager
Copenhagen Airport (CPH), Denmark³

- 1) What is the status of SMS legislation implementation by DCAA for Danish airports? What level of airports is affected?**

In November 2006, DCAA made SMS mandatory for all certified Danish airports.

- 2) Did CPH have an Aerodrome Certification Manual (ACM) prior to the standalone SMS Manual (i.e., prior to 2005)? Would a copy of the CPH's standalone SMS manual be available? If so, could I obtain one?**

CPH has had an ACM for many years.

CPH opted to document SMS in a standalone publication rather than as part of the aerodrome manual. The CPH Safety Manual is about 20 pages long and available to CPH employees on the CPH internal internet.

- 3) How was SMS implemented at CPH Airport? Was a phased approach used? If so, what milestones were developed and actually worked?**

CPH began developing its safety management system in January 2005. The first steps in a process that required that CPH change its approach to safety were taken by the aerodrome manager and the operator's senior management. The aerodrome manager then appointed a safety manager to take charge of the process.

From the beginning, CPH management mandated that the SMS must be practical, effective and easily understood by staff. In other words, the system had to be kept simple. This quality has proven to be the most important criterion for success, encouraging the staff and managers together to claim ownership of the system. An "easy to understand" mantra that governed the development and implementation process proved crucial, for under no circumstances could CPH allow the process to result in a mere theoretical study.

In keeping it simple, as much as possible CPH has adapted safety management processes that already were in place at Copenhagen Airport. Integrating these practices within the SMS eased the introduction of the system.

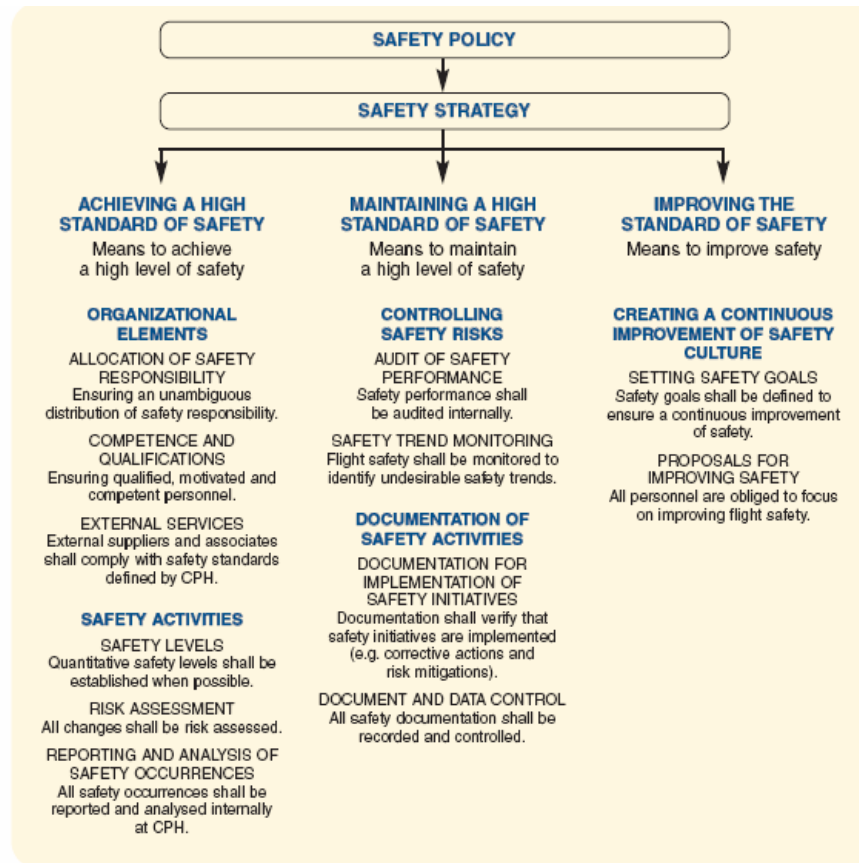
The foundation of the CPH safety management system is a policy that spells out CPH's safety management goals.

³ Also, extensive reference/use is made to his article in ICAO Journal, Number 6, 2006: *Airport operator espouses practical approach to safety management*; pages 18 - 40.



CPH’s safety strategy is based on 12 strategic principles that fall under three broad categories, Achieving a High Standard of Safety, Maintaining a High Standard of Safety, and Improving the Standard of Safety. Under these three categories, the twelve principles are categorized under five sub-categories. The goal of CPH’s safety strategy is to achieve, to maintain, and to improve on a high standard of safety.

CPH’s safety management system is depicted in the accompanying table.



The safety management system developed by Copenhagen Airports A/S is based on 12 strategic principles

Implementation Process

CPH is in the midst of implementing the 12 strategic principles, which inevitably will have an impact on current work procedures.

Besides introducing changes to daily routines, the implementation process also calls for the commitment of organizational resources. Thus, to ensure a successful and practical implementation, CPH has adopted a principle-by-principle approach.

An SMS implementation plan was developed detailing the sequence for introducing the strategic principles. The initial focus has been on three of the principles, specifically the reporting and analysis of safety occurrences, the definition of safety levels, and risk assessment.



These principles were selected for their tactical advantages.

CPH has begun to document all of their safety responsibilities, a major task as it involves defining accountability at the senior management level down through the organization to individual staff functions. So far, CPH has defined the roles of the aerodrome manager as well as senior and middle-level management.

Safety Levels

It was decided early in the implementation process to not define and publish an overall quantitative level of safety, at least not for the present. The organization does not yet possess either the expertise or extensive knowledge base needed to define an overall quantitative level of safety. Instead, CPH relies on a top-ten list of the most significant safety risks, enumerated in order of priority.

The risks are discerned using information from existing reporting systems and trend monitoring. For each risk, a goal is defined as well as a roadmap for reaching the goal.

Risk assessment

The requirement for risk assessment represents the most radical change associated with a safety management system.

If not implemented and then controlled properly, the introduction of risk assessments may jeopardize the successful application of the safety management system, especially considering the system's direct impact on daily work routines. CPH has therefore planned the year-long implementation process very carefully.

4) What did not work?

Risk Assessment

In order for Risk Assessment (RA) to be accessible to the widest number of people with differing levels of safety experience and background, for example, people who do runway maintenance, it was decided to restructure the RA process by making it less complicated and provide more support for a Project Manager.

5) What SMS data will CPH collect?

A number of reporting systems had already existed at the airport when the process of developing SMS began. These included reports on airside security, bird control, foreign object damage, and runway inspections.



6) Is CPH's safety reporting system data, collected from 20,000 people and 400 companies, available to DCAA? Is DCAA interested in getting the data? If they are interested, is the data integrated with a national database, or is it specific to CPH only?

As early as 2001, the DCAA had established a mandatory and non-punitive occurrence reporting system, thus taking the first step to create a just safety culture within Denmark's aviation industry.

Stakeholders are obliged to report all safety-related occurrences to the DCAA. In return, the reporter is protected from disciplinary action or punishment by the non-punitive policy. Without a positive safety culture in place, occurrence reporting would be restrained and CPH would have insufficient means for adequately monitoring safety at the airport.

Safety Occurrence shall be reported to the CAA within 48 hours. If they do so, the reporter is granted immunity.

As all occurrences are to be reported directly to the DCAA, CPH will develop a complementary reporting system, to capture these events. It is essential that such events are included into the airport's internal trend monitoring program.

Since the introduction of this safety reporting program, safety occurrences reports have risen. DCAA now has more data and statistics than previously and is doing more safety analysis. DCAA issues an annual report on the basis of the reported occurrences. Denmark is the first country to have in the world to have such a system, and it eventually could become a model used by the European Community.

7) What results (if any) can CPH show now that SMS is implemented?

SMS is not fully implemented yet at CPH. With CPH's incremental approach to SMS implementation, it is envisaged that all 12 strategic principles will have been put into effect by the end of 2007. After reaching that milestone, development of the SMS will not cease entirely. A significant period of time must be devoted to the effort to infuse the safety culture among all airport personnel.

8) What benefits have been observed due to SMS so far?

- n Incident Investigations are more systematic and structured—they are shorter and more practical. Before SMS, Incident Investigations were unstructured.
- n Risk Assessment in regard to ATC Systems is done now and other divisions in CPH airport are doing Risk Assessments.
- n Safety Data are structured—for example incident location is tracked better.
- n Incident Severity classifications are now done—CPH didn't use to do this. Now CPH has key performance indicators which were developed by the Safety Manager.
- n CPH safety culture is improving.



- n Construction safety is now documented. Previously, when there was a project, Safety wasn't as well documented as it is now.

9) What lessons has CPH learned that could help other airports implement SMS?

- n Do not reinvent the wheel.

Extensive literature is available on the subject of safety management systems. ICAO's newly released Document 9859 is a comprehensive work of reference. Adopt what is known as best practices and integrate this into the current organization's regimen.

An SMS uses many of the same principles found today in quality management and environmental management systems.

- n Ensure senior management support.

The decision to implement an SMS must be taken by senior management, and must be based on a sincere desire to work proactively to advance safety and not simply a wish to fulfill a regulatory requirement. Management support is essential, as SMS introduces procedures that have an effect on current resources.

- n Keep it simple.

If the safety management system is to be "saleable" to all staff, it is important that it remain simple and understandable. Gaining trust in the system is another important facet. Both staff and management must embrace ownership of the system.

- n Use and enhance existing practices.

Each organization is bound to have current practices that may be incorporated into the safety management system. For example, a procedure for investigation of incidents already exists in many organizations. Adapting existing practices as much as possible is advantageous because this can support a trouble-free implementation.

- n Share the responsibility.

The safety manager is the individual responsible for developing and implementing a safety management system. The safety manager should organizationally serve in a support role to the aerodrome manager. It is important to emphasize, however, that this individual is not alone in being responsible for safety at the aerodrome. Rather, safety must be the responsibility of the entire airport management.



10) What is your role as a Safety Manager at Copenhagen Airport with regard to SMS?

The Safety Manager was appointed by the Aerodrome Manager to take charge of the process of SMS implementation at CPH. He fills a support function for the CPH aerodrome manager. Besides being responsible for developing, implementing and maintaining the safety management system, the Safety Manager must ensure that the aerodrome manager is aware of any undesirable trends.



Copenhagen Airport



Westralia Airports Corporation, Perth Airport, Australia



January 2007
Greg Doherty
Airside Safety Manager
Westralia Airports Corporation
Perth Airport, Australia⁴

1) Describe Australian Airport SMS legislation background.

In 1989, the Civil Aviation Authority, now the Civil Aviation Safety Authority (CASA) required airports to have an Airport Operations Manual (well before ICAO mandated them as a standard on 27 November 2003⁵).

In 2002, CASA published and distributed copies of a “Getting Started” booklet to assist airport operators with the preparation of the SMS document. The booklet introduced 10 steps to follow. These steps were later reduced to 8. It was mandated that for international airports the SMS was to be in place by November 2005.

Many airport operators believed that the Aerodrome Manual was to form the main body of the proposed SMS. It was generally accepted that an additional section would be included in the Aerodrome manual and would refer to Risk Management, Risk Registers and procedures to be implemented to manage airport incidents. The ICAO Doc 9774 was the initial catalyst to commence the production of the SMS documentation.

(It should be noted that these assumptions were subsequently not put in place and a stand alone SMS (Manual) was created).

CASA also introduced an electronic on-line version to be used by aerodrome operators as an alternative to the “Getting Started” option.

2) How was SMS implemented at Perth by Westralia Airports Corporation (WAC)? Was a phased approach used? What milestones were developed and actually worked?

In Oct 2002, WAC attended an SMS seminar in Brisbane, where the ICAO document 9774 was presented. This document described ICAO’s 2001 view of SMS for airports.

Using this ICAO guidance, and by following CASA’s document 2, “Getting Started” 10 Steps to SMS Implementation,⁶ the Airside Safety Manager implemented SMS at

⁴ (Perth Airport is operated by Westralia Airports Corporation and located in Western Australia).

⁵ US FAA has required ACMs since 1972.



Perth in Nov. 2002, a phased approach was not used. (NOTE: CASA's 2005 AC 139-16 has 8 steps, but in 2002 "Getting Started" had 10 steps). The Airside Safety Manager, in consultation with the WAC Chief Executive, then wrote a 20-page draft document on SMS objectives and a Perth Airport SMS policy.

Hazard Identification and Tracking System

In November 2002, the first airside SMS workshop was held to discuss and identify airside hazards and evaluate the risk level. This was attended by a number of airport workers with a wide cross-section of responsibilities and experience. Initially the Airside Safety Manager and the Perth airside staff identified 80 airside hazards and from this was developed a "Risk Register" that formed the first stages of the Perth Airport Airside Safety Management System.

The implementation of this procedure meant that from the 1st of March 2003 any incidents would be recorded in the Airside Hazard Register.

For example, the first registered hazard incident occurred on 21 March 2003—it was reported that an excavation adjacent to a taxiway resulted in the non-compliance of standard widths of pavement for aircraft operations.

In July 2003 an operator had left equipment outside the marked equipment storage areas creating a ramp hazard. A goal was set to improve ramp staff safety knowledge before closing the incident report. The SMS procedures were utilized to satisfy the company that the matter had been appropriately managed prior to closure of the incident in December 2003.

In late 2003 and 2004, Perth Airport hired an independent consultant to assess the Airside SMS. The independent consultant's report confirmed that the SMS procedures were consistent with industry risk management methods and that Perth Airport was on track with the introduction of the system.

WAC purchased an incident management software system for Perth Airport. The system enabled staff to report airside operations incidents at any time throughout the day. Incident Managers review the data and assess whether it is necessary to transfer the incidents and track it in the Perth Airport Hazard Registry. The WAC Airside SMS Risk Register is reviewed annually and after four years of operation has now been condensed into 22 airside risks.

⁶ The 10 steps are:

- Gain senior management commitment.
- Set safety management policies and objectives.
- Appoint a safety officer. (for large organizations).
- Set up a safety committee (usually only for large or complex organizations).
- Establish a process to manage risks.
- Set up a reporting system to record hazards, risks and actions taken.
- Train and educate staff.
- Audit your operation and investigate incidents and accidents.
- Set up a system to control documentation and data.
- Evaluate how the system is working.



CASA does not currently request this information and does not track it nationally, however it would be available should it be requested.

3) What did not work?

- n The Airside Safety Manager thought that SMS would have many internal airport players—but found that the aerodrome manual had already had good procedures in place and that the number of people involved in SMS was not as large as he had first anticipated.
- n All staff working on airport go through a number of different training programs on induction; however, there is no standard level from the regulator which can be measured against. For example, is issuing a safety bulletin after an incident sufficient to ensure updates to prior training is accomplished? Who can say? Who will say? The airport or CASA?
- n The CASA SMS Manual on-line was too cumbersome—it generated too much paperwork (76 pages for Perth) without showing benefit. It should also be noted that with the introduction of the Manual of Standards in 2003, the Section 10.1.4 stated “that the SMS does not necessarily generate a need for an additional set or duplication of documents”. This statement basically caused confusion when the electronic online version was introduced by CASA.
- n To date, CASA has not formally audited the Perth Airport Airside SMS. In February 2007, a CASA System team will audit the Perth Airport SMS program. Therefore, Perth Airport cannot, at the time of this interview, “officially” say what worked or didn’t work. However, Perth Airport believes that the management and assessment of incidents using the Airside SMS is robust.

4) What results (if any) can Westralia Airports Corporation show now that SMS is implemented at Perth?

Almost four years after the implementation of the Airside SMS information suggests that it has enabled accountability due to it being an open system with well documented records.

The Airside Safety Manager is confident that the system provides a more efficient document trail and evidence that when an incident occurs appropriate action has been either followed through with normal procedures or presented to the Airside SMS Committee for senior management involvement.

He believes that Perth Airport is a very good airport in terms of safety but cannot confirm that there are less safety incidents at Perth Airport (compared to prior to the introduction of the Airside SMS). His view is that to conduct a proper trend analysis, at least 10 years of data would be required. However, Airside SMS has resulted in:

- n The increase of staff awareness of risk and
- n Perth Airport staff are more responsible in terms of being efficient with the processing of incident reporting including assurance that the incident is closed after a satisfactory outcome.



One major concern at Perth Airport and nationally is the prevention of runway incursions (RI). A number of Australian International Airports have started a Runway Incursion Review Group (RIRG). As a result of the RIRG involvement and strategies resulting from the SMS procedures, WAC and Air Traffic Control (ATC) are working closely to reduce the potential of runway incursion at Perth Airport. One of the first initiatives was to reduce vehicle access numbers onto active runways and schedule maintenance works during quieter periods.

Another positive result was that Perth Airport developed four separate SMS' for the following areas:

- n Airside
- n Security
- n Environmental
- n Occupational Safety and Health

as well as Corporate SMS.

5) What lessons has Westralia Airports Corporation learned that could help other airports implement SMS?

Senior management needs to work with airport staff:

- n To review the hazard register regularly.
- n Monitor incidents and ensure satisfactory outcomes are actioned.
- n Ensure that competent staff members are appointed as the SMS Safety Officer.

Senior management needs to work closely with the government regulator. It is a partnership to ensure that the airport facility provides a safe environment for all users of the airside environment. (For example, airline operators, passengers and airside staff).

It is suggested that a country write an SMS manual template with input from airport managers - not CEO's but airside operational managers. Perth Airport developed its SMS Manual on its own and was invited to provide the document to CASA as a case study in 2003 and 2004 allowing for debate. Prior to the electronic version CASA did not have an SMS manual template to assist Australian airports with the development of Airside SMS. This created confusion and lack of standardization among Australian Airports as it left much up to interpretation.

Airports need to develop the Aerodrome Manual first, and then develop an Airport SMS-documented program.

6) What is your role as an Airside Safety Manager?

The primary function of the Airside Safety Manager is to ensure Perth Airport's compliance with CASA regulations.



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Perth Airport



Interviews with CAA's

Australia Civil Aviation Safety Authority (CASA)



February and March 2007
Richard Allen
Aerodromes Coordinator
Civil Aviation Safety Authority (CASA), Australia

1) What national data collection is CASA doing on SMS?

CASA is thinking about a national data collection system for all aviation domains. However, right now only aerodromes are mandated by Australian law to have an SMS system. Until the legislation is applied to all aviation domains, CASA will not address SMS training just for airports. Ultimately, Australian Airports data will only be a small part of the national SMS data collection effort—most of the focus will be on airlines.

There are three categories of airports in the Australian System—1) Certified,⁷ 2) Registered, and 3) Not certified or registered but served by regular public transport (RPT) or by charter operations at least once per week. Currently 152 Certified Australian aerodromes have an SMS; eventually by the end of 2007, 160 aerodromes will have an SMS. Registered airports are not required to have SMS—there are 140 of those in Australia.

Currently each time an aerodrome is **audited** by CASA, the audit data goes in a file, but this data can't be easily compared. In the future, under SMS, Certified Aerodrome Audits will be tracked. The first certified aerodrome audit by CASA will occur at Perth at end of Feb. 2007.

2) What were the hurdles in mandating SMS at Australian airports?

Lack of Formal SMS Training

CASA: CASA SMS implementation problems developed due to CASA staff not having an understanding of SMS—for example, the Aerodromes Coordinator has had no formal SMS training and is self-taught. CASA staff should have had more training. CASA is now in a stiff SMS learning curve.

Airports: Most of airports didn't understand SMS and CASA should have embarked on a better national education campaign in order for the airports to have better guidance.

⁷ An aerodrome, if it has regular airline service or frequent charter with more than 30 passengers, is the CASA cutoff for being certified and having an SMS.



Accountable Executive

No Australian Aerodrome CEO to date has objected to being named an accountable executive. However, CASA has accepted lower ranked persons other than CEOs to sign as the accountable executive, but that may change in the future. If/when CASA has a better understanding of SMS they may require the CEO to sign. Local governments in Australia's different regions should be OK with this, but a private operator of a small Aerodrome may not be OK with this change.

3) Describe the Confidential Reporting System in place in Australia?

Australia Has Several Reporting Systems

Australia Transport Safety Bureau: There is a confidential reporting system but it is not operated by CASA—it is operated by the Australia Transport Safety Bureau (like our NTSB). This agency has been in place a long time. They have a website:

<http://www.atsb.gov.au/notification/index.aspx>

On this not well publicized website, airport employees can file a confidential electronic Safety and Incident Report (ESIR). Few airport staff are even aware of this site due to lack of education/publicity.

Each Airport

Under SMS, each Australian airport is required to have a mandatory reporting system. The Non-punitive approach is highly encouraged at each airport. However different types of reporting systems have pros and cons:

- n Confidential reporting allows feedback
- n Anonymous—no accountability and reliability—not encouraged—no feedback

It is up to the airport, not CASA to design the system they have.

4) What are benefits of SMS at Australian airports?

While it is difficult to give specific examples of the benefits of SMS, here is one possible positive outcome. For many years Australia required airports to have an Aerodrome Manual. What was missing in the Aerodrome manual was the integration of procedures or processes done by individual airport departments. Now that SMS is in place, while the procedures basically have remained the same, and the SMS manual still has different people doing different pieces, but now they are more integrated by staff being more aware of each others' procedures.

5) What is your job as a CASA Aerodromes Coordinator?

The Aerodromes Coordinator oversees a staff 11 airport inspectors. He coordinates the procedures, money and tools they require to conduct safety audits of 250 airports.



Follow-up March 2007

Issue 1: Airport run by Corporation, Local Authority or Mining Company and Accountable Executive

CASA wants the SMS manual to be signed by an accountable executive; the head of an organization—typically the CEO.

When an airport is run by an airport corporation, this presents little difficulty, because the CEO is normally involved in, and knowledgeable of his/her operation.

However, the majority of airports in Australia are not run by corporations, but are run by local governments. These city councils are responsible for many other public services such as transport, swimming pools and cemeteries, to name a few types of their non-airport responsibilities.

When an airport is run by such a local authority, finding an accountable executive presents a challenge, in that they may not be as familiar with their airport safety responsibilities. CASA is leaning, in this case, to requiring the accountable executive to be the highest ranking, paid employee, such as a City Manager (not an elected council or Lord Mayor, for example). This distinction has legal implications. In the case of a mining company which runs an Australian airport but has a Headquarters in another country, CASA will have to determine the legal implications of identifying an accountable executive and possibly treat that airport as a separate entity, for example, in a law suit.

Issue 2: Extent of SMS Implementation at an Airport

The current CASA Airport SMS regulation doesn't state the whole airport organization has to have an SMS. However some Australian Airport SMS oversight experts (particularly those coming from non-aviation safety backgrounds; for example, mining industry) feel the whole organization has to adhere to SMS principles. Equally, some Australian Airport operators feel SMS applies *only to the airside of the airport* while others feel it applies to the entire airport operation. These views (from both the oversight and service provider), mostly based on years of operational experience, have implication for an airport's safety culture.

As SMS evolves in Australia, it compels CASA to review this position and possibly take a holistic regulatory approach and pertain to the whole airport. This could lead CASA to even apply SMS to a whole city council (in the case described above). Many would say that this is going beyond CASA's mandate, because this would mean that CASA would then require a City Council to develop an SMS and then provide safety oversight of a City Council.

CASA, Australia's On-Line SMS Manual

1) Who was the CASA On-Line SMS Manual Template intended for?



Two documents/media methods were developed—an on-line SMS Manual template for smaller Australian aerodromes and a CD version for larger aerodromes. The on-line SMS Manual for smaller aerodromes is just a word document and is very simple to use.

Currently due to CASA's organization restructuring the CD method is not available right now. Additionally, there were a lot of problems with the software. SMS on-line failed CASA due to funding, etc. It is intended that the CD based SMS will be withdrawn.

2) How was the CASA On-Line SMS Manual Template developed and by whom?

The Aerodromes Coordinator wrote the on-line SMS Manual template for smaller Australian aerodromes based on the three Australia Civil Aviation Safety Authority—Safety Management Systems Booklets:

- n Getting Started
- n What's in it for you?
- n Is it working?

He used a checklist from *What's in it for you?* and wrote a sample template manual based on all the dot points from that checklist. He also based the template on the CASA SMS Advisory Circular.

3) How long did it take to build?

Two weeks.

4) What type of SMS Manual is generated by the template?

The sample template manual and list of hazards for small aerodromes generates an Aerodrome SMS manual that is about 20 pages long.

The CD Template Manual produces a document that is about 80 pages long but this did not include the list of hazards and mitigation strategies.

5) How successful has the CASA On-Line SMS Manual Template been by Australian airports?

The Aerodromes Coordinator ran a number of seminars for groups of aerodrome operators to assist them in introducing their SMS. He believes smaller Australian airports have found it very useful, so he believes the on line manual was successful. However, to date, CASA has not performed any real audits so its products still haven't been formally validated.



UK Civil Aviation Authority



January 2007
Kirsten Riensema
Policy Officer
Aerodrome Standards Department
UK Civil Aviation Authority

1) What is the status of SMS legislation implementation by UK CAA for UK airports? What level of airports are effected and where?

The UKCAA has been implementing SMS at airports for the last 10 years but it is not a requirement. However, having an SMS is considered as part of the licensing criteria and a means of demonstrating that safety is properly addressed.

Licensing (and SMS) applies to airports within the UK where public transport flights take place (including flying training) which includes 142 licensed airports.

2) How was SMS implemented at UK Airports? Was a phased approach used? If so, what milestones were developed and actually worked?

UKCAA did not use a phased approach. Instead, the UKCAA used a softly, softly (or evolutionary) implementation approach, bit by bit, starting with seminars and issuing SMS Guidance on what the CAA are looking for and following “airports and other industries’ best practices”. UKCAA expects aerodromes to tailor the system to their own requirements. The philosophy at UKCAA was that if airports used different approaches to accomplish the same intent, this was OK. When UKCAA conducts an airport Audit, they don’t ask for a particular format or style of SMS. Instead they ask the airport to demonstrate that the safety objectives have been met, looking at risk assessments amongst other things. “They use the airport’s own standard to conduct part of the audit.”

This method allowed different sized airports to develop SMS in a way that is suited to the size and needs of their operation (i.e., made it scalable). This style made it easier for airports to see what benefits they could derive from SMS.

Initially, the UKCAA looked to U.S. Occupational Safety and Health Administration-type standards and practices in order to implement SMS. The reason for this was that because most Aerodromes are employers they were already following OSHA-type methods and they were familiar with them. This familiarity also made it easier for airport operators to accept the new program.



3) What did not work?

Providing a Sample

When UKCAA and others got together and wrote CAP 642,⁸ they gave airport operators an example of procedures called the Manpool Airport sample. In hindsight, this might not have been the best approach. During subsequent UKCAA airport audits, they sometimes would find a photo copy of the Manpool Airport procedure, with Manpool whited-out and the airport's name in its place, or not even whited-out in some cases. This Manpool procedure might not even be relevant at that airport, but the airport did not recognize this. Because the UKCAA had put out the material, the airport assumed it should be followed.

As a result of this experience, the UKCAA has reinforced the “ownership” concept and will eventually redo CAP 642. They recognize that industry has moved on and now, instead of providing a sample, they may try to use a road map style instead.

Domain Specific SMS

The UKCAA (like most CAAs) is organized in functional blocks (or domains), and all blocks put out SMS guidance, each block had their own SMS programs in their own language (for example Maintenance uses Quality Assurance procedures) but the SMS guidance material was not fully integrated. The Policy Officer believes that there shouldn't be individual messages, but rather, an integrated overarching message would be better.

4) What results (if any) can UK airports show now that SMS is implemented?

Although airport audits have provided data on the implementation of SMS, after 10 years, the UKCAA is just now beginning the process to collect data to see what the specific results are. The UKCAA has a corporate steering group for Amendment 8 to Annex 14. This group is planning to hold seminars at the CEO level and next level down (Safety Manager) and will be using actual examples of airport improvements related to SMS. So the Policy Officer will not make a comment now as to whether there are any positive results to report yet.

5) What data is UKCAA tracking on a national basis from Airports regarding hazards, for example?

Ground incidents⁹.

⁸ CAP 642 was written in the mid 1990s in collaboration with Industry and Health and Safety—this method gained airport operator buy-in and leveraged all the collective experience at the time, because not much safety guidance was written for airports' back then.

⁹ The Policy Officer believes that Airports are about procedures and people, whereas airlines/aircraft are more about quantitative data—i.e., Failure rates. She says “don't put “target level of safety (TLS)” numbers on things in airport environment”.



6) What lessons have UK airports learned that could help other airports implement SMS?

Set Timelines

The Policy Officer believes that even after 10 years, the implementation of SMS at UK airports is uneven, some are there, some are not, and this may be due to the fact that UKCAA did not make SMS implementation a regulatory requirement. Given that SMS was a new concept to airports 10 years ago, the evolutionary approach was the most appropriate implementation method and the proper way to get the airport staffs' buy-in, but the time has now come to set implementation timelines to give the program more teeth.

Don't Mandate Formats

There are many acceptable ways to do SMS, the Policy Officer does not believe in saying "your SMS will look like this". During audits, the airport may have a manual that conforms to the prescribed format, but not actually have anything on the ground in place that meets the airports actual needs.

Another example is that the UKCAA must comply with the Single European Sky (SES) program, which includes legislation for SMS and prescribed methods for risk assessment and management for air traffic management, and how to set guidance and specific requirements that will satisfy ICAO and SES. The issue is when (NATS does not run any airports, so is not a good example), the same organization, is running the airport and providing the air traffic service, guidance, implementation and oversight for both domains must be ideally the same. There are many situations where that require a lot of judgment on how SMS should be applied. There often is no standard answer in these situations.

Train CAA Inspectors Properly

Inspector training is an issue—during an airport audit, the onus is on auditor, and this requires good judgment to assess how the airport is meeting the intent of implementing SMS. CAA's need to give auditors the proper tools to develop their judgment during assessments.

7) Does UKCAA have a position on standalone SMS or integrated SMS manuals?

The Policy Officer believes that, like the Aerodrome Manual, SMS manuals are for use by the airport and not the UKCAA, therefore she believes it should not be dictated, what works best for them is the right answer.

8) What is your role as a Policy Officer of UKCAA with regard to SMS?

The Policy Officer sets UKCAA aerodrome policy, writes guidance and gives safety advice to airport operators and inspectors. She serves as a conduit for gathering best practices and interfacing with ICAO.



ICAO—Latin American Airports



February 2007

S. (Sam) Hautequest Cardoso, Ph.D.

Airport & Ground Aids/Airport Operations (AGA) Officer

ICAO South American (SAM) Regional Office

1) What is the status of SMS airports' legislation implementation by States in Latin America? What levels of airports are affected?

Following is the status of the South American (SAM) region and the Caribbean (CAR) region.

Status of SAM States

SMS Legislation

As of 2006, 6 out of 13 (or 46 percent) of SAM States (those highlighted in bold) have SMS legislation.

- | | |
|---------------------------|-----------------------|
| 1. Argentina, 2004 | 8. Panama |
| 2. Bolivia, 2006 | 9. Paraguay |
| 3. Brazil, 2005 | 10. Peru, 2006 |
| 4. Chile | 11. Suriname |
| 5. Columbia | 12. Uruguay |
| 6. Ecuador, 2005 | 13. Venezuela |
| 7. Guyana | |

SMS Implementation

Currently (as of 2006) five airports in SAM region have an established SMS:

Bolivia	3	Cochabamba, La Paz, Santa Cruz de la Sierra under concessionaire SABSA
Ecuador	1	Quito, demonstrated by the concessionaire QUIPORT (Houston and Canada)
Peru	1	Lima, under concessionaire LAP



In the SAM States region, 26 Airports have planned SMS implementation by 2008:

- | | |
|-----------|--|
| Argentina | Complete 3 airports in 2007. |
| Brazil | Started 7 airports in 2006 and plan to finish 7 in 2007 (using a regional approach, they took one airport in each region of Brazil, and started to figure out how to implement SMS). |
| Chile | Plan to finish 3 airports in 2007, 4 airports in 2008; this is very ambitious. |
| Venezuela | Started 1 airport in 2006, plan to start 4 airports in 2007 and 4 more airports in 2008 . |

Plan to finish 5 airports in 2007 and 2 more airports in 2008; this is very ambitious. Many of the SMS-planned airports in the SAM Region listed above are medium to large sized, although some in Argentina and Venezuela are small airports.

Status of CAR States and Territories

SMS Legislation

5 out of 19 (or 26 percent) of CAR States (those highlighted in bold) has SMS legislation:

- | | |
|-----------------------------|--------------------------------------|
| 1. Antigua and Barbuda | 10. Guatemala |
| 2. Bahamas | 11. Haiti |
| 3. Barbados, 2005 | 12. Honduras |
| 4. Belize | 13. Jamaica |
| 5. Costa Rica, 2005 | 14. Mexico, 2005 |
| 6. Cuba, 2004 | 15. Nicaragua |
| 7. Dominican Republic | 16. Saint Kitts and Nevis |
| 8. El Salvador, 2005 | 17. Saint Lucia |
| 9. Grenada | 18. Saint Vincent and the Grenadines |
| | 19. Trinidad and Tobago |

None of the 4 States' CAR Territories has SMS legislation:

- n **France:** French Antilles (Martinique, Guadeloupe, St. Martin, St. Barthelemy)
- n **Netherlands:** Aruba, Netherlands Antilles (Curaçao, Bonaire, St. Maarten, Saba, St. Eustatius)
- n **United Kingdom:** Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Montserrat, Turks and Caicos Islands
- n **United States:** Puerto Rico, Virgin Islands (seven airports)



SMS Implementation

Twenty one airports in CAR region have started or will start implementing SMS:

- n Barbados, 2006, 1 airport
- n Cost Rica, 2006 4 airports
- n Cuba, 2006 7 airports
- n El Salvador, 2006 2 airports
- n US territories, 2007 7 airports

These airports with SMS in the CAR Region are all small to medium sized.

Other airports in the regions are also starting SMS this year but Dr. Cardoso doesn't have the data.

2) How is/was SMS implemented by States in Latin America? Was a phased approach used? If so, what milestones were developed and actually worked?

As a Regional ICAO Officer, Dr. Cardoso began in March 2005 to try to develop Airport SMS guidance material because none was available. He held an ICAO workshop for the NAM(North American Region)/CAR/SAM Regions—Spanish, in Buenos Aires, from 4 to 8 April 2005. It was attended by 105 participants from 19 States/Territories and 4 International Organizations. Participants included civil aviation authorities, airport operators, pilots, air traffic controllers, academia, and lawyers, etc.

He asked the attending States to give presentations about SMS. In order to develop regional consensus, he divided the audience into five groups and one coordinating group. Each group was to discuss the same SMS subjects simultaneously. The coordinating group summarized the information and presented the findings to the whole group. Discussions were carried out until obtaining consensus. If not the subject went back to the groups.

From this workshop material, he returned to Lima to develop and publish in May 2005 the **“Guide For The Implementation Of Airport Safety Management Systems (SMS)”** for the CAR/SAM regions. The guide recommended that the airport start with a framework based on nine subsystems:

- n SMS Policy
- n Definition of Responsibilities
- n Risk Management/Control
- n Investigation and Adjustment of Activities with an Inappropriate Level of Risk
- n Training and Qualification of Personnel
- n Data Documentation and Control
- n Hazard/risks Notification and Reporting of Actions Taken



- n Auditing of System Operation and Assessment of Incidents/Accidents
- n Assessment of System Operation

This guide did not recommend the phased approach later recommended by ICAO in the Safety Management Manual (SMM) published in 2006. The ICAO SMM is more pilot-oriented—the ICAO SMM Phases are based on the underlying assumption that a good database already exists regarding accidents and incidents. Also for example, in the ICAO SMM, Phase One is reactive, and later Phases are more proactive. Dr. Cardoso is not sure if Latin American airports have good databases to start with. His view is that airports should start with a framework—and should map their active process first. He says it is difficult to develop SMS without first identifying your processes.

One Latin American airport, Lima Airport, however, did use a phased approach (but not as characterized by the ICAO SMM). They began in their apron area, and then integrated the airlines into the Lima Airport SMS by ensuring that all airlines operating at Lima were trained on their SMS processes. Next because of a pending major airport expansion project they related their SMS to their master plan, requiring a very rigorous risk assessment process.

3) What did not work?

Dr. Cardoso has some general ideas of what is not working at Latin American Airports trying to implement SMS. He believes:

- n Airports did not establish a good probability matrix.
- n Airports did not know how to go about doing a gap analysis; they did not know what processes they had to start with so they could not identify their deficiencies through a gap analysis.
- n One Airport did not select an experienced Safety Officer or one with sufficient leadership skills. This is a critical point when trying to implement SMS.

4) What results (if any) can airports in Latin America show now that SMS is implemented?/ What benefits have Latin American airports experienced as a result of SMS?

Since SMS mostly only began to be implemented in 2005 in Latin America, it is too early to identify benefit indicators. However, when airport staffs evaluate their airport's risk issues, they became more motivated. This motivation leads them to assess their processes and consequently this leads them to improve their processes.

5) What lessons have airports in Latin America learned that could help US airports implement SMS?

Airports need to:

- n Get a good profile for a Safety Officer, i.e., determine requirements and hire someone with experience.



- n Conduct a thorough Gap Analysis—which means they already have a map of their processes.

6) What is your role as ICAO Officer - Airport & Ground Aids/Airport Operations (AGA) with regard to SMS?

Dr. Cardoso is responsible for providing technical assistance on safety. He serves as ICAO auditor to ensure States comply with Annex 14. He also oversees safety management system training for the SAM and CAR regions, and is an ICAO SMS Instructor.