Implementation of Safety Management System (SMS) at Airports outside the US

Ms. Cheryl R. Andrews, C.M.
The MITRE Corporation

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Overview of Presentation

- Global Aviation Changes, Evolution and History of non-US Airport SMS
- ICAO Airport SMS Requirements
- SMS Table
- Current Airport Progress Outside US and Learned Lessons
- Critical Challenges
- Conclusion
- References

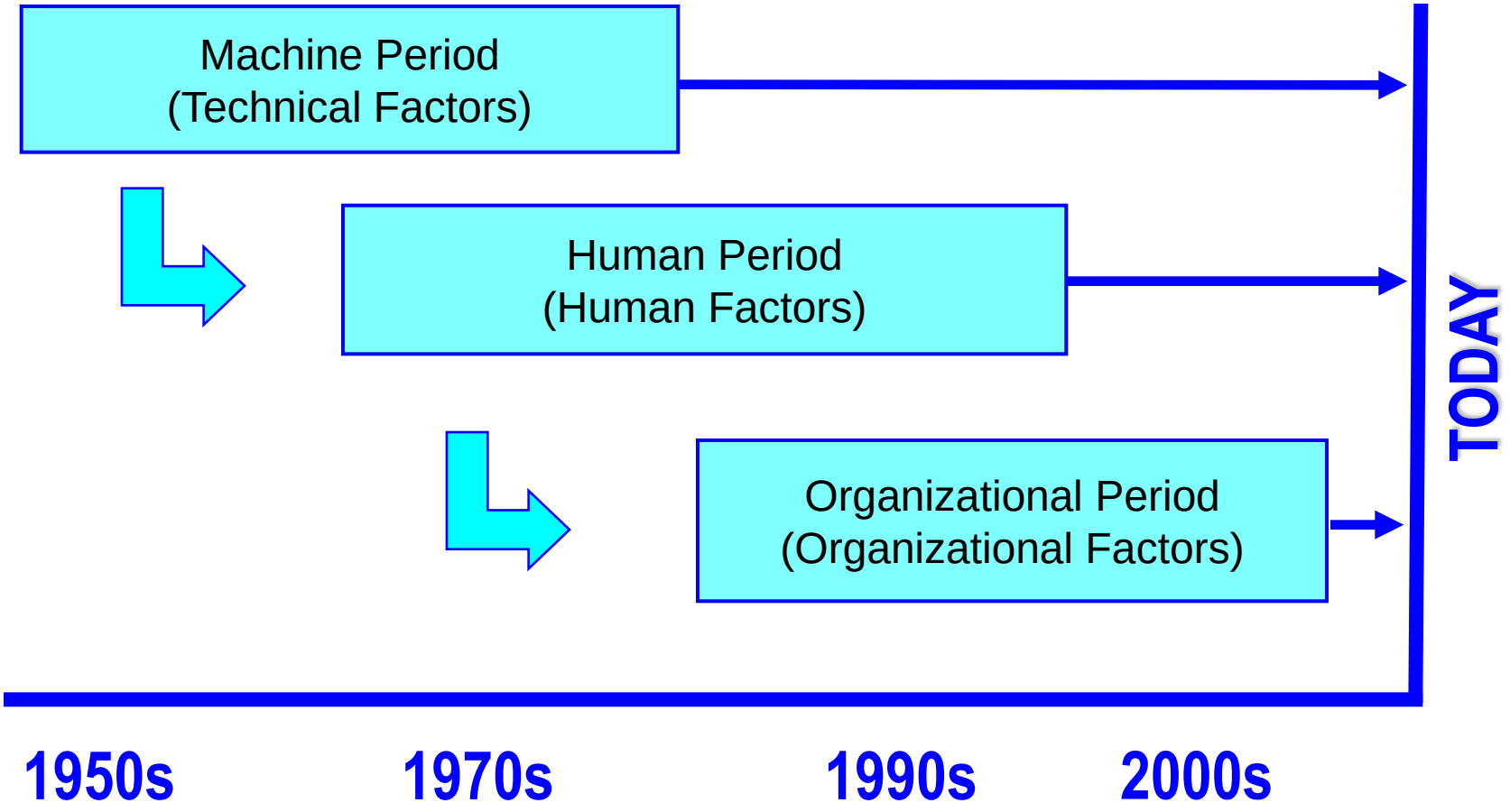
Changes in Global Aviation

- Airline Deregulation
- Airport Privatization
- Explosive Air Traffic Growth
- Complexity of Global Airspace
- Sophisticated Aircraft

- Past: Safety Systems were Reactive & Generic

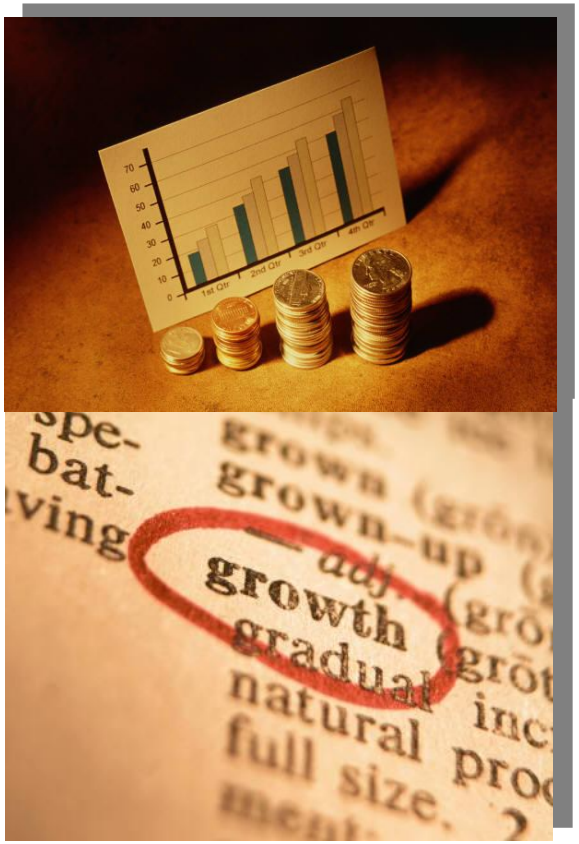
- Future: Safety Systems must be Proactive & Customized

Evolution of Aviation Safety Thinking



History of Airport SMS outside the US

- **Push for SMS**
  - **In 1987, British Airports Authority (BAA) privatized**
    - **It initiated a global change in how airports operate**
  - **In 1992, Rigas Doganis declared "Airports are Businesses" (as opposed to being just public utilities), however, safety needs to remain as a driving force**
    - **ICAO concurred that safety management is prerequisite for sustainable aviation business**
  - **With worldwide push for privatization/ corporatization in the 90s, *it was clear that the safety discipline and safety oversight of these profit-oriented airports were even more imperative***



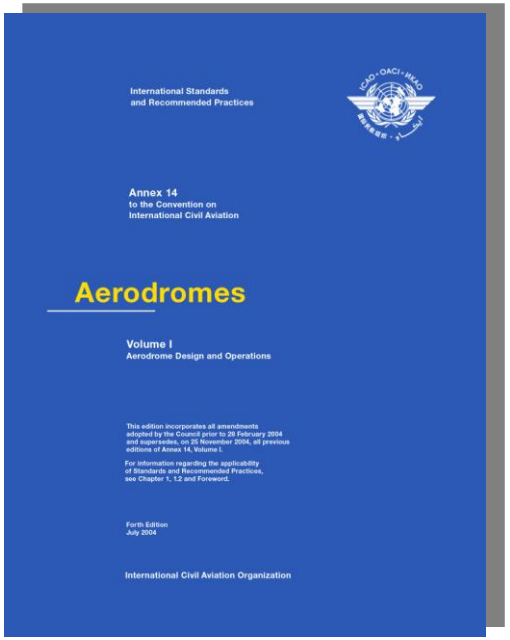
ICAO's Universal Safety Oversight Audit Program

- ICAO adopted universal safety oversight audit program, recognizing need to improve aviation safety and security in an integrated manner
- The integrated concept includes the CAAs, airlines, ATS and airports

CAA	• National Aviation Laws and Regulations • CAA structure, personnel, and procedures • Information collection and distribution
Airlines	• Flight crew qualification/certification • Air operators training and procedures • Airworthiness of aircraft • Avionics certification
Air Traffic Services	• Controller/engineer qualification and certification • Training and procedures • Navigation aid maintenance and inspection • ATC capacity and automation planning
Airports	• Airport operator qualification and certification • Airport operator training and procedures • Passenger terminal safety and security • Terminal gate and movement area control • Instrument arrival/departure procedures

International Civil Aviation Organization (ICAO) Requirements for Airport SMS

- **2000**
  - **ICAO Air Navigation Commission considered proposal to amend Annex 14, Volume I to introduce new requirement for licensing/ certification of aerodromes as a first step**
- **2001**
  - **ICAO began process of defining and recommending safety management system for airports**
- **Originally required by November 2003, was extended to November 2005**
- **Subsequently ICAO issued standards and recommended practices for member States to implement SMS in their airports' operations**
  - **Sections 1.4.1-1.4.4 and 1.5.1-1.5.4 specifically require**
    - **SMS implementation and**
    - **regulatory framework to certify the SMS**

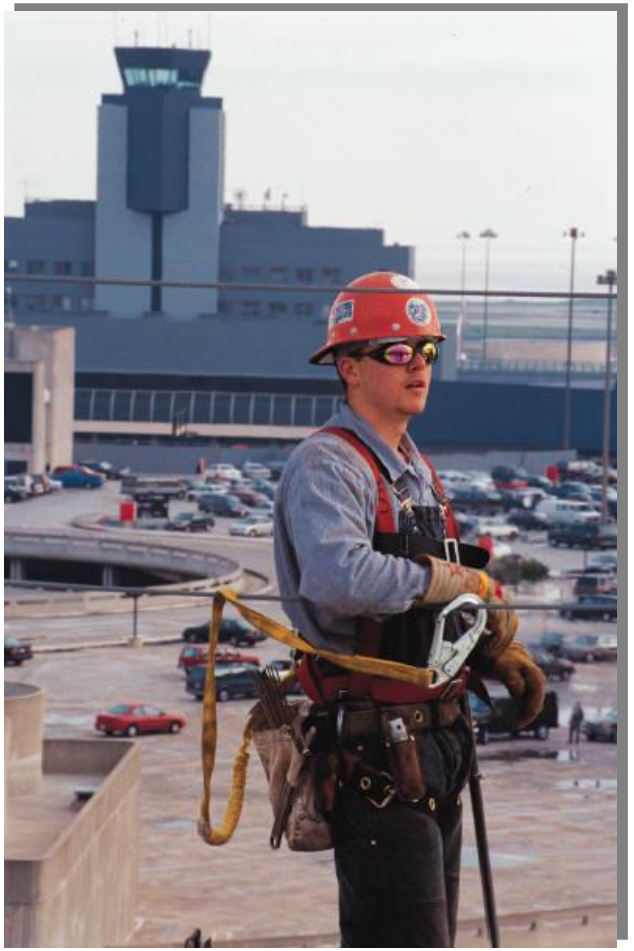


ICAO Requirements for Airport SMS, continued

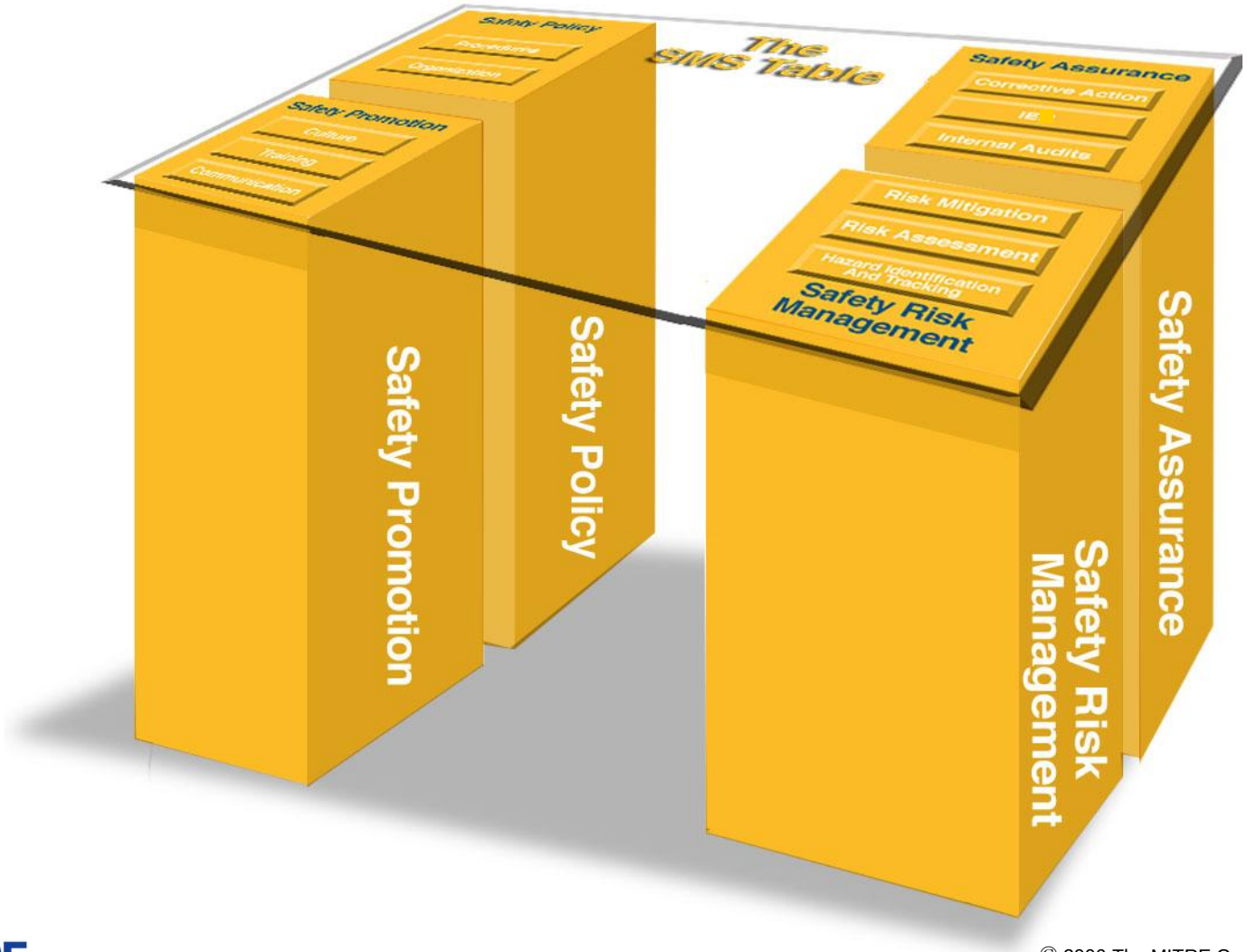
- **Further guidance provided in**
  1. **Manual on Certification of Aerodromes *(Doc 9774)***
  2. **Safety Management Manual (SMM) *(Doc 9859), Chapter 18***

ICAO SMS for Airports

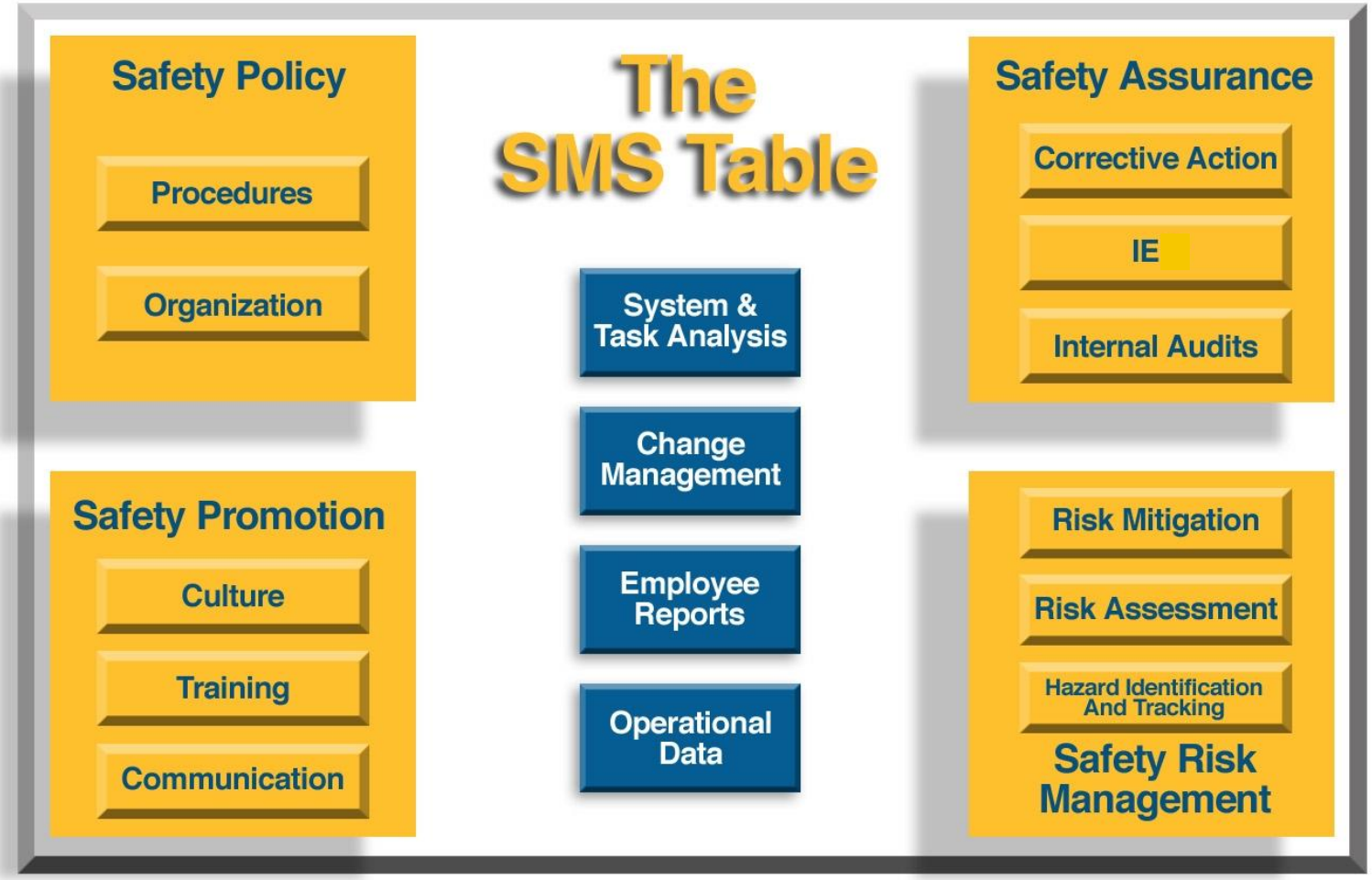
- **SMS is generally referred to as a explicit systemic and proactive approach to managing safety, including**
  - **the necessary organizational structures,**
  - **accountabilities,**
  - **policies and procedures**



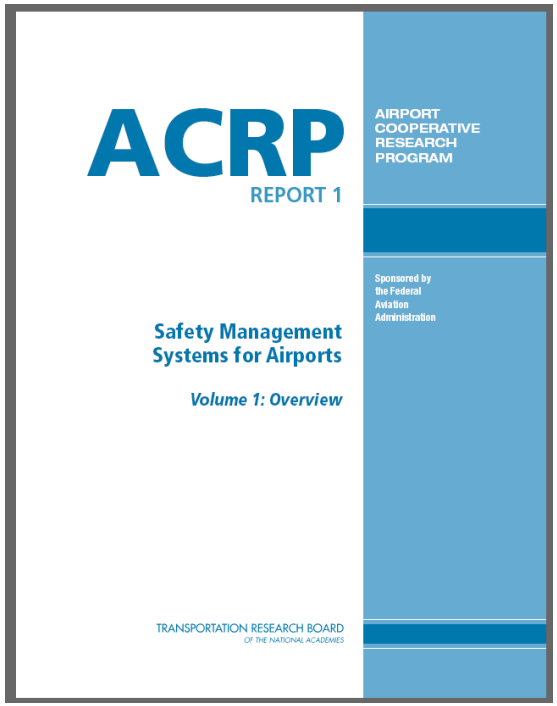
The SMS Table (Side View)



The SMS Table (Top View)



Overview of SMS for non-US Airports



2007 MITRE TRB report to provide airport execs SMS fundamentals

Conducted interviews with non US Airports, CAAs and ICAO to survey their SMS implementation experiences

Sample Interview Questions

- **Questions asked of the ICAO SAM/CAR region:**
  - **What is the status of SMS airports' legislation implementation by States in your region? What levels of airports are affected?**
  - **What lessons have airports in your region learned that could help US airports implement SMS?**
- **Questions CAAs were asked:**
  - **What is the status of SMS legislation implementation in your country?**
  - **What data is your CAA tracking on a national basis from airports regarding hazards, for example?**
  - **Describe the Confidential Reporting System in place in your country?**
- **Questions airports were asked:**
  - **How was SMS implemented at your airport? Was a phased approach used? What milestones were developed and actually worked?**
  - **Is your airport's safety reporting system data available to your CAA?**
  - **What results (if any) can your airport show, now that SMS is implemented?**
  - **What lessons has your airport learned that could help other airports implement SMS?**
  - **What benefits have been observed at your airport due to SMS so far?**

Current Airport Progress Outside US

- SMS has been adopted by a few Airports
  - SMS implementation worldwide is relatively new
- Wide variation in the way that SMS principles have been applied
  - Central issues include:
    - Variations of SMS components – Tailored to circumstances
    - Implementation Styles – No standard approach
    - Scalability
    - Scope
    - Number of steps
    - CAA Implementation Methods
    - Legislative Experience – Limited information available
    - Non-punitive Reporting Systems – No cookie cutter structures
    - Accountable Executive – Responsibilities may need clarification in certain models of airport management
    - Process Analysis – Depth of experience varies
    - Data Collection – Types, methods and analysis varies

Variations of SMS components – Tailored to circumstances

- **Airports are like snowflakes, each airport is unique, has its own challenges and its SMS will need customization.**

Example:

- **Though the United Kingdom Civil Aviation Authority defines components of an airport's SMS, they believe that *airports are to decide which components need to be developed themselves*.**
  - **However, they stress:**
    - **that the simpler and clearer the SMS the better**
    - **SMS should complement existing systems and procedures.**

Civil Aviation Authority

Implementation Styles – Three different approaches depending on emphasis

Evolutionary style

- SMS principles implemented over several years.
- Safety culture gradually becomes ingrained in employees' attitudes and actions.

"Fast Track" adoption

- Implements SMS at a relatively rapid pace.
- Although this approach may bring the airport into compliance with SMS regulations, it may not result in a sufficiently fundamental change in safety practices and attitudes.
  - **An aggressive employee training program will be required to achieve this transition.**

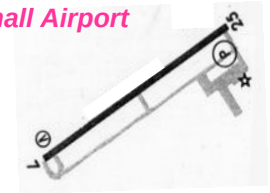
Phased methodology

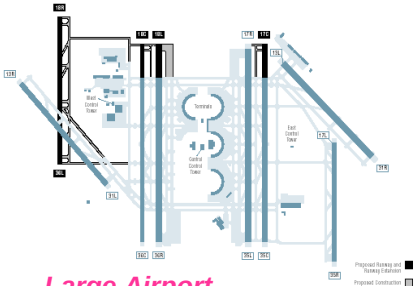
- Uses dates and milestones to implement the various aspects of SMS;
- Allows time to address any issues that arise before advancing to the next stage.

Scalability – yes!

- **SMS can be scaled to different sized operations without becoming a bureaucratic exercise**
  - **Viewpoint by Australia's CASA in "*Getting Started*"**
    - **For small organizations, SMS is seen as a positive, fewer people involved and therefore less difficult to communicate**
  - **From the small airport operator perspective however, they worry about not adding more burden than they can handle.**
    - **"I am already working 24 hours a day and you want me to work 48?"**

Small Airport





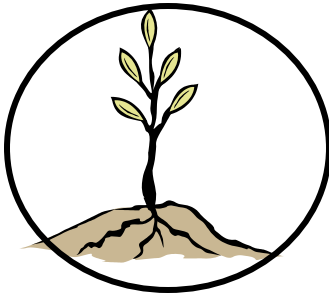
Large Airport

Scope – evolving with experience

- **IATA recommends IMS – not SMS – in order to be more encompassing than only focusing on safety.**

- **Australia's CASA interview revealed they started with airside, but are now moving into the terminal building, parking lot and other physical structures at the airport.**

- **The bottom line is that SMS is most effective when applied to the entire organization.**

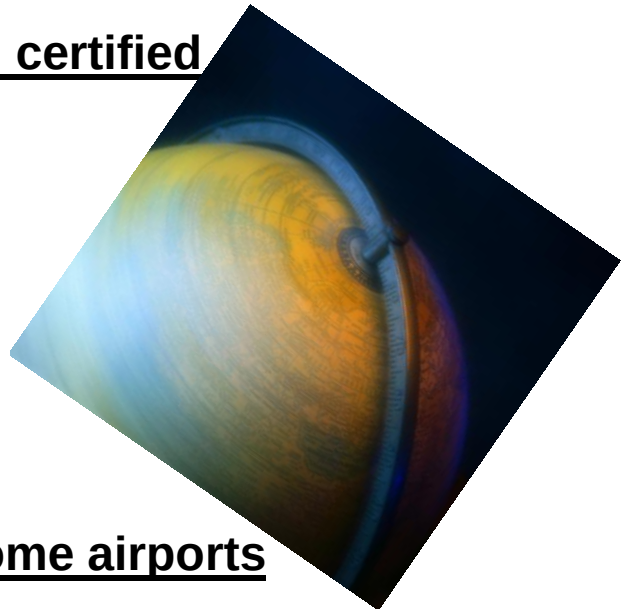


Some CAAs' SMS Implementation Methods

- **Permitted airports to institute safety management processes by themselves, using some or all of the following methods:**
  - **Gathering best practices and lessons learned from more experienced organizations**
  - **Enlisting independent consultants or other airport operators to verify proposed safety programs**
  - **Compelling airports to initiate SMS self-education programs**
  - **Seeking software vendors to supply airport-specific data collection systems**

Legislative Experience – Sample Progress

- **A number of States have airport regulations, certification and licensing**
  - **Some States made SMS mandatory for <u>all certified</u> airports; for example:**
    - **Peru, before 2003**
    - **Cuba and Argentina (2004)**
    - **Singapore, Brazil, Ecuador, Barbados, Costa Rica, El Salvador, Mexico (2005)**
    - **Denmark (2006)**
    - **Australia (by Dec 2007)**
  - **Some States made SMS mandatory for <u>some airports</u>**
    - **Canadian Group 1 (by Dec 2007)**
  - **UKCAA implementing SMS at airports for last 10 years but it is <u>*not a requirement*</u>.**
  - **NZCAA is currently evaluating mandating SMS for <u>certificated operators</u> across the whole civil aviation system.**



Reporting Systems – No Cookie Cutter Structure

- **Different cultures approach non-punitive reporting systems with great caution or uncertainty.**
  - **Identified three types of reporting approaches:**
    - **Internal airport reporting**
    - **CAA-reporting**
    - **NTSB-type reporting systems**
  - **Some cut out airport operator entirely in order to ensure whistleblower protection**

- **Voluntary/confidential incident reporting programs are a cornerstone of SMS.**
- **Airport operators will need to review their thinking on the safety culture messages they are conveying to airport employees.**

Accountable Executive – Hard to pin down

- **Responsibilities may need clarification in certain models/sizes of airport management/ airports**
  - **Privatized airport**
  - **Local council run airport**
  - **Government run airport**

Airports' Safety Processes – Thoroughness of Evaluation Varies

- As part of gap analysis, airports must identify their safety processes.
  - 2005 Berlin University of Technology study, ~1,600 airport safety-relevant (flight-operational) processes identified and verified with Munich and other German airports.

- A re-evaluation of existing processes will not only help determine where SMS needs to be incorporated, but also how airport operations may be made more efficient.
  - By-product of this may reveal some areas of duplication which, if eliminated, could help reduce some costs.

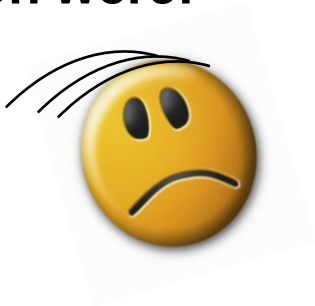
Reference: Schorcht, Hendrik, Briefing: "SMS at aerodromes in Germany: Results of a research project", Berlin University of Technology, Institute of Aeronautics and Astronautics, Section Flight Guidance and Control Air Transportation, Budapest, 06,12,2005.

Airports' SMS Data Collection

- UKCAA is tracking
  - airport ground incidents data
- NZCAA will continue to track
  - accident and incidents, and will track airports' hazard mitigations in future
- CPH is collecting
  - airside security, bird control, foreign object damage (FOD), runway inspections and safety occurrences data
- Perth is tracking
  - airside hazards and airside operations incidents
- Singapore is tracking
  - birdstrikes and runway safety hazards

Korean Experience: Attitude Challenges

- **Biggest challenges in SMS implementation were:**
  1) **low interest levels**
  2) **reluctant and passive attitudes towards new changes**



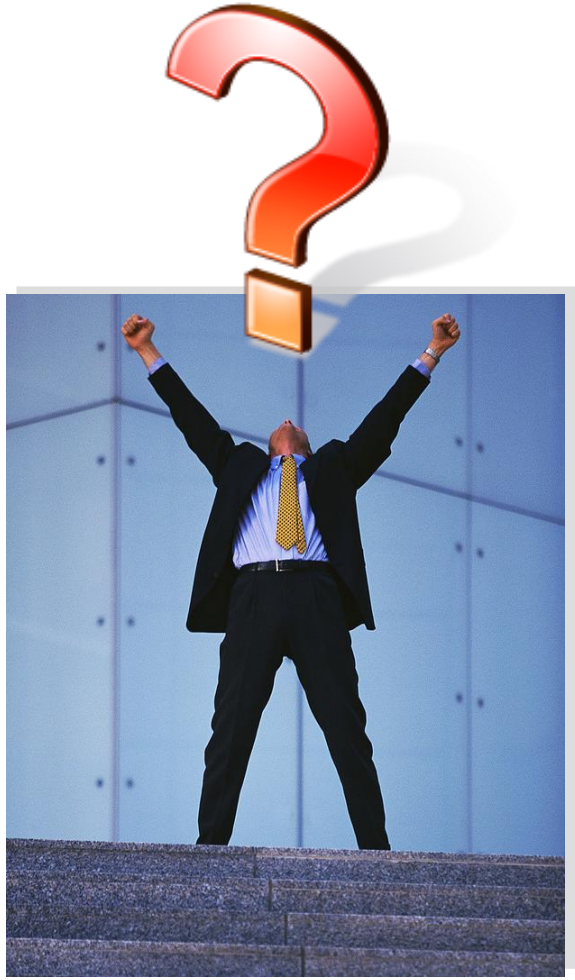
- **Insiders exhibited negative attitudes towards increase in amount of tasks resulting from new changes**

- **Associated parties also worried about possible disadvantages arising from the safety inspection**

Reference: DCCA/06-IP/44, [Korean Airport Corporation] *KAC's Experience on Implementing a Safety Management System*, 17 March, 2006

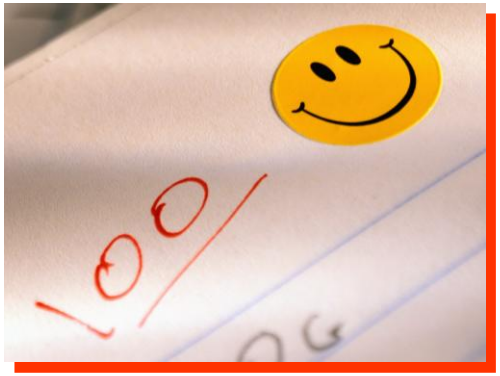
SMS Success?

- **In non-US airports' interviews, no one would go on the record and say whether they had yet achieved success with SMS.**
  - **They *would say* certain specific areas were improved.**
  - **They *would not say* that less accidents were occurring now that they had a reporting system, for example…**



Lessons Learned - from *Interviewed Airports'* Perspective

- **Do not wait until legislation is in place – start the process *now*.**
- **Some or much of *what you have* in place today can be used in an SMS framework.**
- ***Documentation* is the key SMS component to ensure and demonstrate an airport's due diligence to requirements.**
- **Tackle SMS in *stages*, rather than trying to do everything at once.**
- **If not already done, establish and maintain a *good working relationship with your partners* and members of the airport community, including the regulator.**



SMS Critical Challenges

- **Based on the interviews with airport authorities outside the US, the following aspects of SMS implementation were deemed both difficult to accomplish but also critical to success.**
  - **Cultural change.**
  - **Determining legal liability/accountability.**
  - **Identifying a trained and qualified Safety Manager.**
  - **Instituting data collection methodologies.**
  - **Developing a workable non-punitive hazard-reporting system.**
  - **Integrating airport SMS with other domains, particularly air traffic control and airlines.**

These merit substantial research and planning.

Conclusion

- **Aviation community around the world recognizes that safety is paramount to sustain global aviation growth**
- **No universal solution for improving airport safety, but SMS offers a customizable method that has been shown to work in other industries, including airlines**
- **Airport SMS should include the entire operation but avoid over-complexity, focus on processes, recognize the data-driven nature of SMS and be prepared for a phased approach**
- **Airport SMS implementation requires regulatory framework, management commitment and communications, cultural building and organization structure**

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