SMS in Canada

Implementation, Surveillance and General Strategies

Canada

Agenda

- SMS: the Canadian Model
- Implementation
- Issues with Implementation
- SMS in Small Operators
- Internal Policy: Enforcement, Aeronautics Act
- Measuring Performance
- Surveillance
- Questions

SMS in Canada

What is SMS?

The Definition (CAR 101.01):

> Safety management system means a documented process for managing risks that integrates operations and technical systems to ensure aviation safety or the safety of the public

In practice what does this actually mean?

TCCA's SMS Model: Components and Elements

Safety Management Plan	1. Safety Policy 2. Non-punitive Safety Reporting Policy 3. Roles, Responsibilities & Employee Involvement 4. Communication 5. Safety Planning, Objectives & Goals 6. Performance Measurement 7. Management Review
Document Management	1. Identification & Maintenance of Applicable Regulations 2. SMS Documentation 3. Records Management
Safety Oversight	1. Reactive Processes 2. Proactive Processes 3. Investigation and Analysis 4. Risk Management
Training	
Quality Assurance	
Emergency Response Planning	

Where Can You Find the Regulations?

- CAR 106 – Accountable Executive
- CAR 107 – Safety Management System Requirements
- CAR 573.30/31/32 – Safety Management System (Aircraft Maintenance)
- CAR 705.151/152/153/154 - Safety Management System (Flight Operations)
- CAR 706-15 – SMS (Maintenance requirements for Air Operators)
- CAR Part 3 (airports) and Part 8 (ANS)

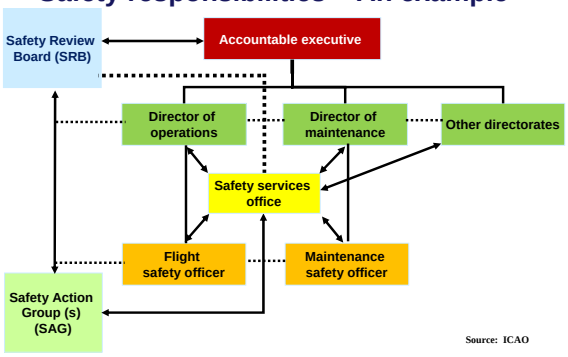
In retrospect!

- It's far simpler to have regulations in one place and applicable to all Certificate Holders
- Only one set of regulations have to be changed

The Accountable Executive

- "Accountable executive" means the person having financial and executive control over an entity that is subject to these regulations.
- The accountable executive is the certificate holder or the certificate holder's representative.
- Single executive for all certificates held by organization (AOC, FTU, AMO, AEO, ATO etc..).

Safety responsibilities – An example



Source: ICAO

TCCA and the ICAO Requirements

ICAO	Transport Canada
• Policy and Objectives	• Component 1, 2, 5
• Safety Risk Management	• Component 1, 3, 5
• Safety Assurance	• Component 1, 3, 5
• Safety Promotion	• Component 1, 4, 5

Before you Draft: Determine what do you have already?

Reactive
- Flight Safety Programs

Proactive –
- Maintenance Quality Assurance Programs
- Human Factors Training Requirements
- Crew Resource Management (CRM)

- **Remember:** you probably have 85% of what's required in place already.You just don't have it throughout the organization

Implementing SMS in Canada

Current Implementation Timetable

PART	AREA	Gazette I	Gazette II	Planned In-Force
Part III	Airports (Group II)	July 2007	December 2007	January 2009
Part IV	Flight Training Units	March 1 2010	June 2010	June 2010
Part V	Approved Mfrs (561)	June 2010	Oct 2010	December 2010
	702/3/4 AMO's	Sept 2009	Dec 2009	September 2009
Part VII	702/3/4 Operators	Sept 2009	Dec 2009	December 2009
	705 Operators	In progress along with associated AMOs Phase 4 complete (assessment in 2010)		
Aircraft Certification		Sept 2011	Jan 2012	Jan 2012

Implementation Status

- Publication of SMS requirements for all CAR 705 (large air carrier) AOC holders and CAR 573 AMOs with ratings to work on aircraft operated in CAR 705 operations – June 2005
- All other AMOs – September or December 2009
- Manufacturers - 2010
- FRMS requirements - September 2009
- Airports – Group 1 – January 1, 2008
- Airports – Group 2 – January 1, 2009
- Air navigation service providers – Jan 1, 2008

Implementation Phases

Phase 1 (3-months)	Phase 2 (12-months)	Phase 3 (12-months)	Phase 4 (12-months)
•Accountable Executive •Gap Analysis •Implement-ation plan & responsible person	•SMS Plan, Policies, and Procedures •Reactive Reporting System	•Proactive hazard identification	•Training •Quality Assurance •Emergency Preparedness

Phased in approach - Status

Car 705 AOC Holders	**Phase 4/Complete**	**67/17**
AMOs with ratings to work on CAR 705 a/c	**Phase 4/Complete**	
Airports – Group 1	**Phase 3**	**10**
Airports – Group 2	**Phase 2**	**310**
Air traffic control	**Phase 3**	**2**

On-Going Monitoring

- At the end of each phase an Acceptance Validation is conducted
- A failure to demonstrate the conditions of the exemption have been met may result in Certificate action
- To date several NOSs have been issued
- On going monitoring continues

Implementation Issues

Common Problems

- Documentation is incomplete or inadequate
- Organizations do not understand proactive/predictive processes
- Performance targets/measures are often insufficient
- There are misconceptions about the liberties SMS affords: de-regulation and self regulation
- Perception has become reality: TC has had to defend SMS at the highest levels of government.
- Standardization – 5 regions, 1000 inspectors
- People just don't want to be regulated!

What Does it take to Successfully Implement SMS?

Things to consider

- Resources
- Internal Policy
- Get Your Own Staff on Board – Manage the Change
- Surveillance
- Your Organization
- Guidance

Resources

- SMS is not resource neutral
- Given the additional resources required for SMS certification activity we anticipate a modifications to the implementation plan will have to be made
- Unless additional resources are available adjustments will have to be made.
- Mitigations include:
  - Adaptations to the implementation schedule might include delaying implementation of Aerial Work operators SMS
  - New risk based surveillance methods should help

Small Operators

Small Operator Working Group

- 19 small operators: AOCs, AMOs, FTUs
- Goals:
  - Determine if the current regulatory framework can be applied in smaller organizations
  - Evaluate the current implementation plan for SMS and document any recommended changes
  - Evaluate the tools and guidance material on SMS developed by TCCA and document any recommended changes;
- Outcome: size and complexity critical to success

Guidance Material for Small Operators

- Advisory Circular 107-02 Safety Management Development Guide for Small Operators
- It contains practical examples of how the components that make up a SMS might be implemented.
- Each organization is required to develop policies and procedures in accordance with their unique operating requirements.

Example:

Component: Safety Management Plan; Element: Non-Punitive Reporting System
Expectation: There is a non-punitive safety reporting policy is in place that provides immunity from disciplinary action for employees that report safety deficiencies, hazards or occurrences.

Minimal Complexity – One Person Operation	Moderate Complexity
The non-punitive aspect of a reporting policy in a one-person operation is unnecessary, as it adds no value to the process.	By removing the threat of disciplinary action, a non-punitive reporting policy encourages a healthy reporting culture. The non-punitive reporting policy should: • provide for immunity from disciplinary action for persons that report safety deficiencies, hazards or occurrences. • define conditions under which punitive disciplinary action would be considered (E.g., illegal activity, negligence or wilful/intentional disregard are clearly defined. RH - OK • ensure that the policy is widely understood within the organization. (E.g., be evaluated as part of the SMS QA audit) **Example:** *NON-PUNITIVE REPORTING POLICY* *Our company fully supports and encourages a culture of openness and trust between all company personnel. This cannot be achieved unless employees feel able to report occurrences or hazards without the fear of unwarranted retribution. Reporting occurrences or hazards should become a priority for all employees.*

Example:

Component: Safety Oversight; Element: Reactive Processes (Occurrence Reporting)
Expectation: Multiple

Minimal Complexity – One Person Operation	Moderate Complexity
A simple reactive process is essentially a means to report, analyze and identify corrective actions for occurrences (incidents or accidents that have already happened). -A reactive process should: -Capture internal information including accidents/incidents and other SMS related information -Be simple and accessible -Include a process to monitor and analyze trends -Develop corrective actions through root cause analysis ***Note:*** *In an organization of minimal complexity, a simple documentation tool such as an Incident & Hazard record book for reactive process management may be considered.*	A reactive process is essentially a means to report, analyze and identify corrective actions for occurrences (incidents or accidents that have already happened). As the company increases in complexity it is possible that more individuals with delegated levels of management, will become involved in these processes. A reactive process should: -capture internal information including accidents/incidents and other SMS related information -be simple and accessible -include a feedback process to notify contributors that their report have been received and to share results of the analysis

Implementing SMS in Smaller Organizations

- Adjust the implementation time frame
- Small operators need more upfront time to plan and less time to implement

Phase 1	Phase 2	Phase 3	Phase 4
6 months	11 months	11 months	11 months

- Provide appropriate guidance
- Train inspectors to understand size and complexity
- Work with the industry to build small operator champions
- Get the Associations/Unions/ involved

Internal Policy – Does it Promote an Environment Where SMS will Thrive?

Enforcement Policy Changes

- To promote the effective use of SMS;
- To promote voluntary compliance with regulatory requirements, without necessarily resorting to punitive action; and
- To nurture and sustain a safety culture, whereby employees can confidentially report safety deficiencies without fear of subsequent punitive action.

Substance

- No punitive action will be taken against a certificate holder governed by an SMS, if:
  - The contravention appears to have been unintentional; and
  - The certificate holder is proposing corrective measures that are likely to address the event and prevent recurrence.
- Partnership is critical to the success of SMS. Existing adversarial relationships have to change.
- Organizations have to include the regulator in event analysis and the regulator has to be willing to step back from the traditional authoritarian role

Aeronautics Act Amendments

- To encourage reporting without fear of information being made public, Transport Canada has proposed legislative amendments to protect “voluntarily” supplied information relating to incidents from being accessible through the Access to Information legislation.

Performance Measurement

Why Measure??

- "If you can't measure it, you can't manage it"
  - Kaplan and Norton, the balanced scorecard, 1996
- "Measuring allows us to know if we're making progress…whether we are moving forward, standing still – or falling behind" – Roy Romanow, 2001
- The safety performance of the operation needs to be monitored, proactively and reactively, to ensure that the key safety goals continue to be achieved. -TC SMS Guide, 2002

What is Performance Measurement?

- A methodology that allows us to measure whether we are accomplishing our safety objectives and targets
- It provides a mechanism to determine whether or not the SMS is effective
- Quantitative measurements are used to track and improve performance, SMS plans, processes, practices, and operations
- However, we need more than this one type of measurement. Qualitative measures such as safety culture assessment, while less tangible, can also demonstrate system effectiveness.

Types of performance measures

- Types of performance measures
  - Reactive (Lagging)
    - Accidents for example
  - Proactive (leading)
    - Items that are monitored to reduce the occurrence of incidents

Reactive Performance Indicators

- Measure past safety performance
- Critical for focusing SMS improvement efforts

Examples of Reactive (Lagging) Indicators

- Incidents
- Service Difficulty Reports
- MEL items deferred
- Litigation Expenses
- Regulatory Fines and Penalties
- Dispatch reliability

–% CAP completion
–% training completion
–Results of audits
–Labour sick days
–Replacement Property Loss
–Absenteeism

Importance of Proactive Measures

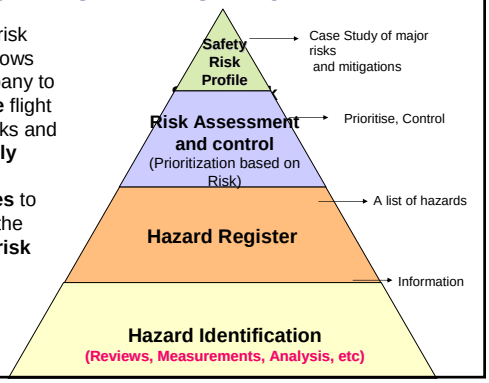
- The use of proactive measures will provide the data to reduce the incident which has been captured by the reactive measure
- Many times without a proactive measure you will just capture the number of incidents and not have the mechanism to improve the processes to reduce those incidents
- A safety risk profile can help to drive your proactive performance measures by identifying hazards and risks and prioritizing what you should deal with first.

The Safety Risk Profile – What is it?

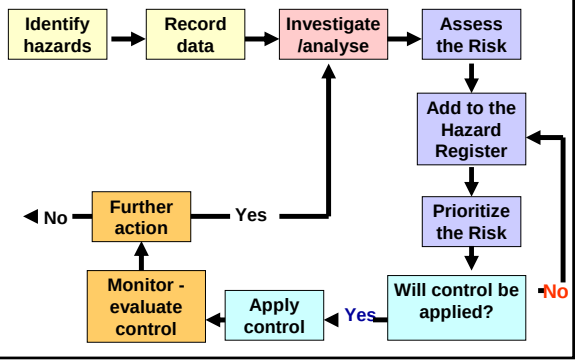
- A prioritised list of the known risks in the organization
- In order to develop a Safety Risk Profile the company must develop a hazard register relating to the organization
  - This requires active and on-going monitoring to determine what are the hazards and the attendant risks
- Hazard identification is an on-going activity. Hazards emerge and evolve as a result of changes in the operating environment, this occurs frequently. As such we can not assume that all hazards are visible, although most are predictable.
  - For example, most hazards in aviation are not as obvious as a pool of water on the floor. We have to actively seek to know, understand and manage them.

WHY BUILD A SAFETY RISK PROFILE?

A safety risk profile allows the company to **prioritise** flight safety risks and **effectively allocate resources** to address the **highest risk** areas



Building the Safety Risk Profile



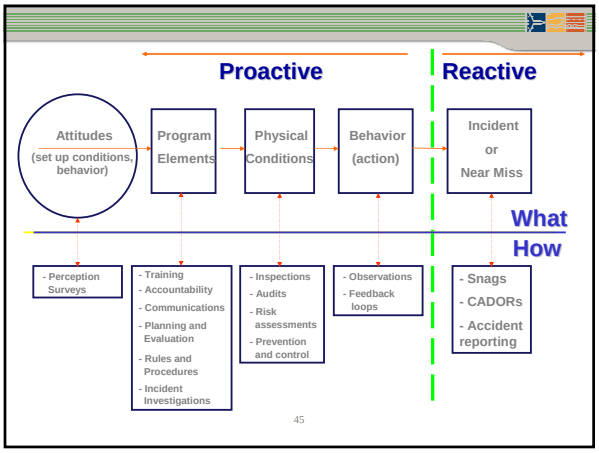
What to include in the Profile?

The Safety Risk Profile should identify your top 10-12 risks to flight safety as it is impossible to address all risks

Hazard	Ranking	Identified Risk
Poor Lighting in hangar	1	Reduced ability to identify cracks on aircraft
No tool management procedures	2	Loss of tool in aircraft

Use of the Safety Risk Profile

- This methodology allows for the effective allocation of resources where they are required the most.
- The safety risk profile should be linked to the objectives and goals of the organization
- FOR EXAMPLE:
  - Risk number 1: Damage to aircraft as a result of unsecured equipment
  - Objective 1: Reduce incidents of aircraft damage due to unsecured equipment
  - Goal 1: Reduce aircraft damage by 50% within 6 months
  - Control (CAP): Introduce new procedure for restraining equipment
  - Measured by number of aircraft damage incidents due to unsecured equipment



Proactive Performance Indicators

- Predict future safety performance — examples include
  - # of procedures reviewed/updated per year
  - training completion rates
  - # of equipment/workplace inspections completed
  - # of safety suggestions submitted
  - # ratio of minor incidents/hazards to critical incidents
  - % Safety Goals Achieved (Strategic Planning)

Uses of Performance Measurement

Plan → Develop metrics based on safety risk profile

Do

Check

Act

Uses of Performance Measurement

Plan

Do → Collect data on all measures

Check

Act

Uses of Performance Measurement

Plan

Do

Check →

Act

- Analyze the data
- Track/trend the performance over time
- Provide feedback on status of issues and measurement methods

Uses of Performance Measurement

Plan

Do

Check

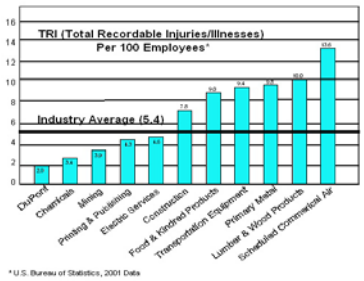
Act →

- Guide continuous improvement
- Report performance results to key stakeholders

How Performance Indicators Create Understanding: Examples

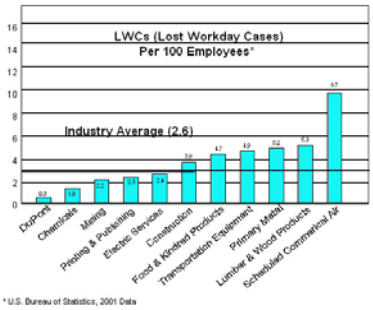
Aviation OSH Data

STATE OF THE AIRLINE INDUSTRY



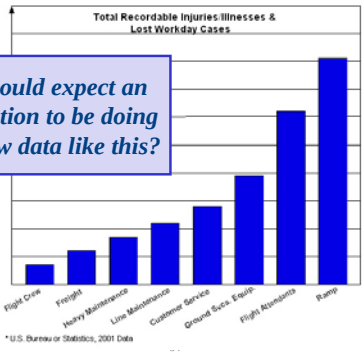
* U.S. Bureau of Statistics, 2001 Data

STATE OF THE AIRLINE INDUSTRY



* U.S. Bureau of Statistics, 2001 Data

WHERE AIRLINE INJURIES OCCUR



What would expect an organization to be doing if you saw data like this?

* U.S. Bureau of Statistics, 2001 Data

Performance indicators lead to CAPs

Corrective action plans/programs (CAPs) lead to :

- Improved employee perceptions, morale
- Improved productivity, profitability, market share
- Improved product quality, zero defects
- Better employee retention, recruiting, low turnover
- Improved customer perception/satisfaction

Trend Analysis

- The trend can be more important than time specific data
- Track progress towards the goals
- Compare progress relative to other organizations (benchmark)

Performance indicators support continuous improvement

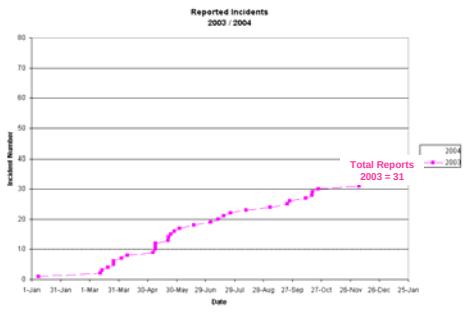
- Gather information
- Analyze results
- Identify areas for improvement
- Set up CAPs
- Develop and select performance indicators to measure the progress
- Review progress regularly

Performance Indicator Development Example

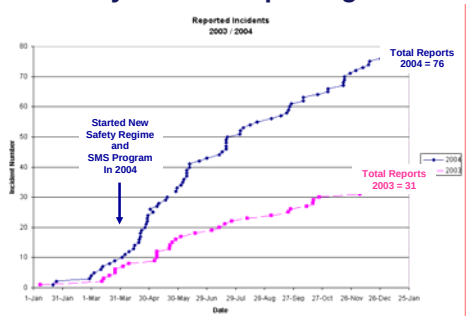
Scenario introduction

- Small airline started an SMS including the development of performance measures and reporting systems
- This example will show how this airline used this system to identify and rectify a very serious air safety issues

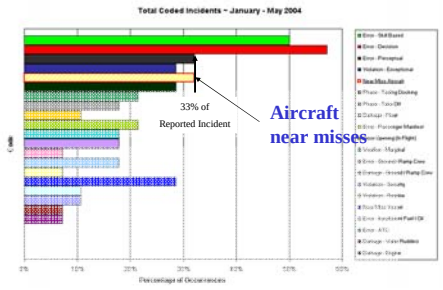
Example Report



Data Analysis from reporting



Identified critical issue



*Total number of reports in time period = 30

Scenario continued

- They realized they had a serious near miss issue
- The airline developed measures and began to collect detailed data on the critical issue to determine the exact issue and the root cause(s)
- How did they do that?

1. **Identify key areas to be measured** → **Collect and analyze data on all key areas**
2. Create an encompassing list of safety measurement questions
3. Determine performance measures to answer the questions
4. Quantify the data

Near Misses

- Through the incident reporting system, a high level of near misses for an airline were detected
- Due to airspace restraints and high traffic volumes **ALL** operators were at risk
- This was not only *the example airline's* problem

1. Identify key areas to be measured
2. **Create an encompassing list of safety measurement questions** → Circumstances of occurrence
3. Determine performance measures to answer the questions
4. Quantify the data

1. Identify key areas to be measured
2. Create an encompassing list of safety measurement questions
3. **Determine performance measures to answer the questions**
4. Quantify the data

a. When did near miss occur?
b. Weather conditions during occurrence
c. Operators involved
d. Aircraft type

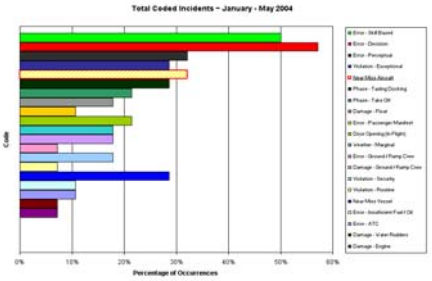
1. Identify key areas to be measured
2. Create an encompassing list of safety measurement questions
3. Determine performance measures to answer the questions
4. **Quantify the data**

a. Time and date of occurrence
b. Weather data
c. Operators
d. Aircraft type

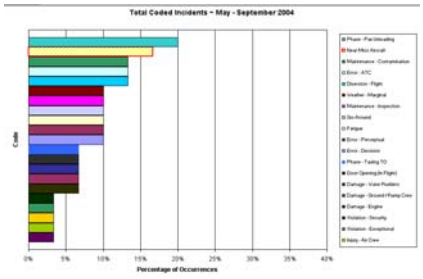
Data analysis

- Once the data was collected a trend was uncovered
- The near misses all occurred during specific times of the day
- There were multiple airlines involved which had very similar schedules during these periods
- The airline shared this information with the others and they all agreed to amend their schedules

Prior to corrective action
Jan-May 2004

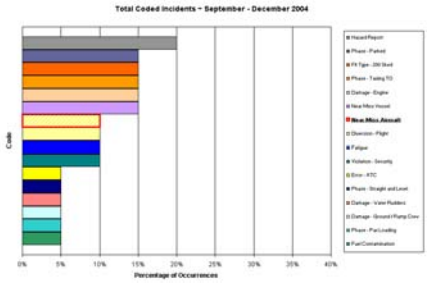


May-September 2004



*Total number of reports in time period = 28

September – December 2004



*Total number of reports in time period = 20

Will improving performance indicators make a difference?

Yes! Improving performance indicators will…

- Drive SMS excellence by focusing on things that matter
- Link SMS performance closer to the overall business strategy
- Enhance ability of SMS to compete for resources internally
- Improve usefulness through benchmarking

How do you know a performance indicator is effective?

If it:

- links to safety goals and objectives
- gets to the root cause
- measures key factors that drive performance
- supports SMS improvement strategy

Making the Link Between Safety and Economics

Reduction of hangar incidents:

Objective	Safety Performance Measure
Business Objective: Reduce Costs	Reduction in insurance rates
Safety Objective: Decrease number and severity of hangar incidents	• Total number of event • Number of damage-only events • Number of near-miss accidents • Lessons learned from event analyses • Number of corrective action plans developed and implemented

Key Points

- Performance measures are the most important aspect of continual improvement within an organization
  - If you don't measure it, you can neither manage nor improve it.
  - Performance measurement must lead to corrective actions plans
- Measurement Data must be
  - Precise and accurate
  - Easy to interpret
  - Significant to the organization's safety objectives
  - Able to be benchmarked

Key Points

- Performance indicators should be identified according to strategic and operational objectives
  - Proactive (leading) and reactive (lagging) performance indicators
  - Trending over time
- Performance measurement must be rigorous, systematic and quantifiable

Transport Canada's SSP – Linking Performance Measurement, SMS and the SSP

Compliance Table

ICAO State Safety Program Requirements	Canada's State Safety Program
1. State's safety policy and objectives 1.1 - CAA safety standards 1.2 - CAA safety responsibilities & accountabilities 1.3 - Accident and incident investigation 1.4 - Enforcement policy	**1. Canada's safety policy and objectives** 1.1 CARs 1..2 IMS, IBP, PAA 1.3 TSB, Safety Intelligence, CACO, CADORs 1.4 Enforcement Policy Manual CAD 39
2. **State's safety risk management** 2.1 - Safety requirements for service providers SMS 2.2 - Approval of service provider's acceptable levels of safety	2. **Canada's safety risk management** 2.1 CARs 2.2 FOIPD, Flight 2010

Compliance Table

3. **State's safety assurance** 3.1 - Safety oversight 3.2 - Safety data collection, analysis and exchange 3.3 Safety data driven targeting of oversight on areas of greater concern or need	**3. Canada's safety assurance** **3.1** •SMS Assessment and PVI Procedures •Validation of an Accountable Executive •Acceptance Procedures for Phase 2, 3 & 4 of the SMS Regulatory Exemption • SMS Certification Procedures for New Organizations •Regulatory Oversight Activities during the Transition to Safety Management System (SMS) 3.2 CAIRs, CADORs, TSB, Safety Intelligence 3.3 SMS Assessment Procedures, CAD 20, Risk Management (underdevelopment risk indicator dbase)
4. **State's safety promotion** 4.1 - Internal training, communication and dissemination of safety information 4.2 - External training, communication and dissemination of safety information	**4. Canada's safety promotion** 4.1 Learning services training development, TC website, ASL, Civil Aviation Publications, Flight 2010, SMS Information sessions, Regional fora, CAESN 4.2 Learning services training development, TC website, ASL, Civil Aviation Publications, Flight 2010, SMS Information sessions, Regional fora, CAESN

SSP, SMS and Performance Measures

- State requires a general set of performance parameters to start with e.g. successful implementation of SMS in all organizations
- Measures can be quantitative and qualitative such as to encourage development of a safety culture
- As the SSP and SMS level become more sophisticated a more specific safety risk profile for all facets of the industry is required.
- Encourage individual organizations to focus on these issues
- Strategic targeting provides a focused, more effective approach
- Caveats: Accurate data is required; partnership with industry

SMS Surveillance Methodology

Existing Surveillance Models

- Assess compliance and confirm that the regulatory framework has been met
- Give the regulator a baseline of information to work from
- Establish an understanding of the company's capabilities
- However, do traditional audit methodologies allow us to understand if the system works effectively in the context of the company?
- Does your methodology allow you to understand the inter-linkages that exist between every component of the system?

Ask Yourself?

- Will your present surveillance model work in the context of SMS?
- Will a tick and flick audit system give you the information you need?
- Is it possible to understand the effectiveness of the System as a whole, throughout the company, when audits naturally drive us into individual silos?

The Inter Connected SMS

Audits versus Assessment

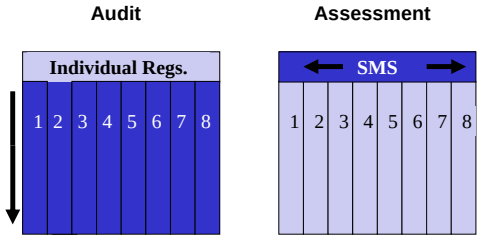
Past (Audit)

1. Auditing to the procedures
2. Focus is on records review
3. Oriented mainly towards conformity to standard
4. Documentation reflects front line employees and middle management

Future (Assessment)

1. Assessment of the processes
2. Balances manual review, on-site interviews, observations and records review
3. More oriented towards outputs and outcomes
4. Documentation reflects more involvement with senior management

Surveillance Entry Points



Relevant Documentation

- SI SUR–001: *Safety Management System Assessment and Program Validation Procedures*
- SI SUR–002: *Enhanced Monitoring*
- SI SUR–003: *Regulatory Oversight Activities during the Transition to Safety Management System (SMS)*
- CAD SUR-008 – *Frequency of Surveillance Policy*

Relevant Documentation con.td

- SI 106-001: *Validation of an Accountable Executive*
- SI 107-001: *Acceptance Procedures for Phase 2, 3 and 4 of the Safety Management System(SMS) Regulatory Exemption*
- SI 107-002 : *Safety Management System (SMS) Certification Procedures for New Organizations*
- SI 107-003: *Acceptance Procedures for Phase 2, 3 and 4 of the (SMS)*

Relevant Documentation con.td

- AC 107-001: *Guidance on Safety Management Systems Development*
- AC 107-002: *Safety Management Systems Development Guide for Small Operators/Organizations*

How?

- Surveillance is conducted as per SI SUR 001
- Options available:
  - Assessment
  - Program Validation Inspection
  - Process Inspection (coming in SI SUR 001 rev 3)
  - Audit
  - Inspection

Assessment Methodology Framework

- Expectation framework
- Questions for all levels of personnel
- Scoring Criteria
- Regulatory References

Example: SMS Component and Element Framework

Table A – SMS Assessment Protocol Framework	
Component	Element
1. Safety Management Plan	1.1 Safety Policy
	1.2 Non-Punitive SMS Disciplinary Policy
	1.3 Roles, Responsibilities & Employee Involvement
	1.4 Communication
	1.5 Safety Planning, Objectives and Goals
	1.6 Performance Measurement
	1.7 Management Review
2. Document Management	2.1 Identification and Maintenance of Applicable Regulations
	2.2 SMS Documentation
	2.3 Records Management

Example: SMS Expectation

Component	Element	Expectations for the element
Safety Manage-ment Plan	**1.2 Non-Punitive SMS Disciplinary Policy**	**A There is a policy in place that provides immunity from disciplinary action for employees that report safety deficiencies, hazards or occurrences.** **B Conditions under which punitive disciplinary action would be considered (e.g. Illegal activity, negligence or willful misconduct) are clearly defined.** **C The policy is widely understood within the organization.** **D The organizations have letters of understanding between employees and/or third party contractors and management to document the disciplinary policy, and the manner in which it will be implemented.** **E Personnel express confidence and trust in the policy.** **F There is concrete evidence that the organization is applying the non-punitive disciplinary policy.**

Example Criteria:
1.1.2 Non-Punitive SMS Reporting Policy

1	2	3	4	5
Safety-related reports or inadvertent errors result in punitive action being taken against individuals.	Less some aspects of (3)	There is a policy in place that provides immunity from disciplinary action for employees that report safety deficiencies, hazards or occurrences Conditions under which punitive disciplinary action would be considered (e.g. illegal activity, negligence or willful misconduct) are clearly defined and documented. The policy is widely understood within the organization.	All of (3) plus some aspects of (5)	The organization's have letters of understanding between employees and/or third party contractors and management. Personnel express confidence and trust in the policy. There is concrete evidence that the organization is applying the policy.

Example Criteria:
1.5 – Safety Management Planning

1	2	3	4	5
Safety objectives are poorly defined and/or not communicated. Resources are not allocated for achieving safety objectives	Less some aspects of (3)	Safety objectives have been established utilizing a safety risk profile that considers hazards and risks. Objectives and goals are consistent with the safety policy and their attainment is measurable. Safety objectives and goals are reviewed and updated periodically. There is a documented process to develop a set of safety goals to achieve overall safety objectives	All of (3) plus some aspects of (5)	Safety objectives are based on a safety risk profile that includes all areas of the organization (certificated and non-certificated). The organization has a process for analyzing and allocating resources for achieving the objectives and goals. Etc.

Scoring Criteria

- A score of (1) or (2) is considered to be partially implemented but not effective
- A score of (3) is considered has meeting the minimum acceptable standard of assessment
- A score of (4) is considered to exceed the minimum acceptable standard of assessment
- A score of (5) is considered to meet all of the criteria for an award level of (3) plus all of the additional requirements listed under the criteria for that component.

Scoring Rules

- Expectations are not intended to be used as a checklist. They are provided as indicators for understanding what a good element might contain and for standardizing the assessment or PVI process.
- The components and elements cannot be considered in isolation. They must be assessed in relation to the other parts of the SMS.
- Scoring award levels are based on a set of defined expectations. The expectations relate to an element being assessed. For example, a safety management plan must contain a safety policy. An expectation of the safety policy is that it should contain a clear declaration of commitment and objectives.
- As SMS are progressive in their development, we expect to see continuous improvement in the system.

Achieving Excellence

- To assign a level 4 score, assessors must verify that the all level 3 expectations and a significant portion of level 5 expectations for the element in question are documented, implemented and utilized, and that the element is effective and interacts effectively with other SMS elements in both regulated and non-regulated areas of the organization.

  Note: Non-regulated areas may include, but are not limited to, baggage handling, catering, security, fuel service, snow removal, hangar operations, marketing, and any other area not associated with the CARs that supports the activities conducted under the certificate.

Achieving Excellence

- To assign a level 5 score, it must be verified that the all level 3 expectations and all the level 5 expectations for the element in question are documented, implemented and utilized, and that the element is effective and interacts effectively with other SMS elements in both regulated and non-regulated areas of the organization.
- An organization that does not apply its SMS to non-regulated areas cannot be considered a level 5 because it does not have the ability to consider hazards and risks outside of the regulated areas. It does not therefore have a complete safety risk profile. Likewise, an organization that does not subject all regulated and non-regulated areas to continuous improvement cannot be assigned a score of 5 because it is not applying the plan-do-check-act (PDCA) management principles in all areas of its operation.

Benefits of Achieving Excellence

- Continuous improvement is clearly demonstrated
- Enhances the safety risk profile of the company
- Provides a risk indicator for extending surveillance cycles and for acceptance of alternate means of compliance e.g. approval of amendments to manuals

TCCA's Surveillance Toolbox

Method	Frequency	Planning
Assessment	Yes – (CAD SUR 008)	Mandatory
PVI	Yes – (CAD SUR 008)	Mandatory
PI	No	Risk based
AV	Yes	Mandatory
Audit	No	Exceptional
Inspection	No	Exceptional

Definitions

- "**Assessment**" a process comprised of a documentation review and on-site review of the entire organization in order to determine if the safety management system is documented, in place and effective. A score of 1-5 is assigned.
- "**Program Validation Inspection**" means a process comprised of a focused review of one or more components of an organization or a Safety Management System (SMS). A score is assigned.

Definitions

- "**Process Inspection**" an in depth review of the processes utilised to produce an output. This might include a review of the steps taken to create an end product such as an incident report and would include people, equipment, environmental factors, monitoring and testing methods, procedures and materials used or consumed. A score is not assigned.

Definitions

- "**Acceptance Validation**" means a process comprised of a documentation review and an on-site review to confirm that an element is documented, in place and understood, and is being utilized by the organization under review (no score is assigned).

When to use each tool?

- **Process Inspection** – Any time as part of normal surveillance and in circumstances where risk indicators merit a quick intervention
- **Audit/Inspection**– only in circumstances where the company SMS does not yield enough information to make an accurate determination of the System's health

Approaches to Surveillance During the Transition to SMS

Surveillance in Companies Implementing a SMS

- Organizations will be subject to an acceptance validation of the required components and elements;
- The components and elements will not be assigned a score; they will be deemed satisfactory or not satisfactory.
- Acceptance Procedures for all phases of the SMS Exemption can be found in Civil Aviation Staff Instruction 107-001.
- Traditional audit and inspection tools can be used where there is insufficient information in the SMS to determine if the system is working effectively

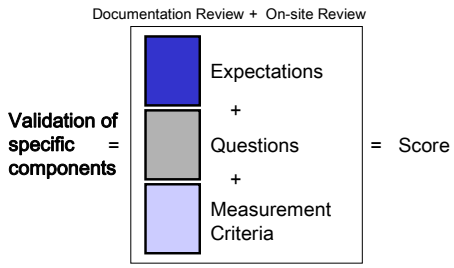
Surveillance in Companies with a SMS

- Organizations with a SMS will be subject to an assessment;
- Detailed assessment procedures can be found in SI SUR 001: Assessment and Program Validation Procedures.
- Organizations will also be subject to routine on-going monitoring. Any indication that the company is experiencing difficulties may invoke a PVI or PI.

Surveillance in Companies with a SMS cont.d

- If Transport Canada is satisfied that the organization is operating safely, routine on-going monitoring will continue.
- An unsatisfactory outcome may result in a complete safety management system assessment.
- Traditional audit and inspection tools can be used ***only*** where there is insufficient information in the SMS to determine if the system is working effectively or not.

Program Validation Inspection



Note: Effectiveness is Assessed

PVIs – What gets Assessed?

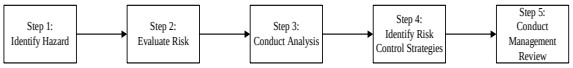
- AMOs - Quality Assurance Program
- AOC (Car 705) – Safety Oversight Program
- AOC – Control of Operations
- Airport Operator – Regulatory obligations of the airport operator
- ATS - Operating certificate requirements

Process Inspections – What does it look like?

Process Flow Example: Safety Risk Profile

What is a Safety Profile? A safety risk profile is a prioritized list of the known risks in your organization. In order to develop a safety risk profile you must develop a hazard register relating to your organization. This requires active and on-going monitoring to determine what are the hazards and the attendant risks.

Task 1 – Breakdown the steps



Process Inspections Cont.d

Task 2 – Identify the expectations (SUR 001) associated with Step 1

Expectation	Doc. Ref	Acceptable Y/N	Comments
3.2A The certificate holder has a proactive process or system that provides for the capture of information identified as hazards and other data relevant to SMS and develops a hazard register.	Manual page 72-75		
3.2H The certificate holder conducts hazard analyses and builds a safety case for changes that may impact their operations.			
3.2I The certificate holder has clearly defined interval between hazard analyses.			
(other)			

Process Inspections Cont.d

Task 3. Identify the performance indicators associated with Step 1? (i.e. how does the organization ensure that requirements have been met?)
•List of hazards identified

Task 4. How, when and where are hazards identified? Describe the process as per the company's documentation
•Monthly basis – review of qa findings, documentation

Task 5. Who is accountable and responsible for identifying hazards?
PRM, Dir. Flight Ops, AE

Task 6. Who does the work?
QA manager

Task 7. (a)Have the personnel involved in hazard identification been trained? (Y/N)
(b) Have competencies been evaluated?
List the training that has been identified for the personnel involved:

Task 8. What records does Step 1 generate?
•List of hazards

Process Inspections Cont.d

- PIs are not scheduled. They are a formal way of organising routine surveillance activities
- Documentation is prepared and reviewed in advance and confirmed on site through interviews and record reviews
- The tasks have to be repeated for each step in the process flow
- The process assessment is based on compliance and effectiveness
- All defined expectations must be assessed – no score is assigned
- No findings are issued. Depending on the observations a corrective measure may be requested or a PVI may be convened.

Surveillance in Organizations without a SMS

- PVIs will be conducted on an annual basis until the company is required to implement a SMS.
- Where there is evidence that the company is experiencing difficulties the following actions shall be followed:

  A program validation of the organization will be conducted

  – Where an organization achieves a score of (3) or more on the program validation normal surveillance frequencies will be observed
  – Where an organization achieves a score of (2) or (1) enhanced monitoring procedures will be enacted.

Enhanced Monitoring

- Enhanced monitoring will be conducted in accordance with SI SUR 002.
- EM kicks in automatically when a certificate holder scores a 1 or 2 on PVI.
- Where an organization scores a 2, the CA may exercise discretion and not invoke EM. Typically this discretion will be applied where the CH in question has a history of successfully completing CAPs and has an excellent compliance record.
- Where EM results in a cancelled certificate the certificate holder will be required to submit an initial application should they wish to reacquire a certificate.
- Under certain circumstances EM can be used when a company fails an assessment.

EM Basics

Phase I – Day 1 through 10

- Issuance of NOS to company: notification by letter
- Duration of EM = 90 days from receipt of letter
- Company must address conditions stated in the NOS and submit an Improvement Plan identifying the milestones it intends to meet

Phase II – Day 11 through 90

- On-going monitoring of the organisation

Using Risk Indicators

- The use of risk indicators to extend audit cycles is acceptable. Typical indicators such as financial change, labour difficulties, management practices, internal audit or QA program findings may be used.
- Where a company has a SMS, risk indicators maybe obtained from a review of the company's SMS
- A company risk profile database is being developed and should be operational by August 2009. This provides a standardised approach to understanding company risk levels and can be used in conjunction with surveillance findings to determine whether an extension to the PVI/assessment cycle is acceptable.

How to Conduct an Assessment

Assessment: Review Components

- Familiarise yourself with the components and elements of the model and the relevant expectations, e.g.

Component 6 – Emergency Response Preparedness	Yes/No
The organization has an emergency preparedness procedure, appropriate to the size, nature and complexity of the organization	
The Emergency preparedness procedures have been documented, implemented and assigned to a responsible manager	
The emergency preparedness procedures have been periodically reviewed as a part of the management review and after key personnel or organizational change	
The organization has a process to distribute the ERP procedures and to communicate the content to all personnel	
The organization has conducted drills and exercises with all key personnel at intervals defined in the approved control manual	

Assessment Overview

- An assessment consists of:
- Documentation Review (Preparation);
- Onsite review - Activities (including interviews and sampling);
- Analysis;
- Reporting.

Assessment Worksheets

- Validation Worksheets have been developed for all SMS components
- Worksheets include expectations, questions and regulatory references

ASSESSMENT WORKSHEET
COMPONENT 5, ELEMENT 5.1, OPERATIONAL QUALITY ASSURANCE

ORGANIZATION:	**REVIEW ACTIVITY:** ☐ **ASSESSMENT:** ☐ **VALIDATION**
TEAM MEMBER:	**DATE:**
CONTACT PERSON AND TITLE:	

General Information:

Question key: **AE:** Accountable Executive **SM:** Senior Management **LA:** Lead Auditor **E:** Employee **SMS:** Person Responsible for the Safety Management System

SECTION A – EXPECTATIONS

SECTION B: QUESTIONS	**SECTION C: RESPONSES**

On-Site

- Entry Briefing
- Shall be conducted by assessment manager
  - with Company Key Personnel
- Shall be recorded – include:
  - Persons in attendance;
  - Date;
  - Time.

On Site Activities

The PVI team will:

- Conduct Interviews with a representative sampling of company personnel;
- Sampling rates as per the ASQ reference chart

Lot Size	1-8	9-15	16-25	26-50	51-90	91-150	151-280	281-500	501-1200	1201-3200
Sample Size	All	13	13	13	13	13	20	29	34	55

Interview Guidelines

Do's

- Prepare a schedule;
- Prepare for interview;
- Use open ended questions;
- Ensure questions understood;
- Listen carefully.

Don'ts

- Use complex questions or phrases;
- Use jargon or slang.

Interview Guidelines cont'd

Do's

- Use techniques from Interview skills course;
- Have 2 persons;
- Thank Interviewee
- Ask if they have questions for us

Don'ts

- Continue if atmosphere becomes highly negative;
- Be side-tracked from objectives.

Interviews

What works

- Ask broad based open ended questions;
- Only ask specifics if not covered in discussion.

What to avoid

- Asking questions line by line from guidance document / worksheet.

On Site Activities cont'd

The Assessment team will:

- Review a sample of:
  - Documents;
  - Records and;
  - Aeronautical Products.
- Sample size per SUR-001.
- Make Observations;
- Record results.
- Where? – Worksheet(s)

Exit Briefing

- Conducted with Company Key Personnel
- Discuss:
  - Issues identified
  - Report Timelines
  - CAP
  - Follow-up
- Record

Scoring the Assessment

- Compare:
  - Performance (interviews, document reviews, observations)
  - Against
  - Expectations
- Analyze results to determine compliance:
  - Award a Score – Based on Measurement Criteria (level 1-5)

Scoring cont'd

- All level 3 expectations MUST be met to score the company a 3.
- If any not met – score is either 2 or 1.

Scoring Levels

Score Level	Measurement Criteria
1	The system is not documented, not implemented or not functioning.
2	The system does not meet the minimum regulatory requirements as the following expectations were not observed: • A qualified person has not been appointed to manage the operations • The quality assurance system did not cover all functions defined within the certificate(s).
3	The system meets the minimum regulatory requirements.
4	The system meets and in some cases exceeds the minimum regulatory requirements as the following expectations were observed: • The operator uses approved operational flight plan documentation regardless of flight stage lengths; • The audit report recognizes excellence to provide opportunities for recognition by management and motivation of people.
5	All aspects of the system exceed the minimum regulatory requirements and demonstrate industry best practice.

Determining Compliance

Assessment Manager:

- Determines Compliance:
- when score is a 2
  - Determine if deficiencies are:
    - Minor, moderate or major
- If the findings are major enhanced monitoring may be applied and a notice of suspension will be issued.

Assessment Report

- A formal assessment Report is issued.
- Must include:
  - Component summary
  - Scoring level chart language
  - Score
  - Findings if score = 1 or 2
  - Explanation of findings

Corrective Action Plan (CAP)

Must Include:

- Short Term Corrective Action
- Long Term Corrective Action
  - Root Cause & Actions to prevent re-occurrence
  - Timetable for implementation
- What the findings mean:
  - Minor – 90 days to submit CAP
  - Moderate – 30 days to submit CAP
  - Major – 30 days to submit

Follow-up

- Monitors CAP Implementation
- Assessment closed when follow-up completed
- Closing letter sent when assessment closed

Final Comments – The Reality Check

- TCCA started SMS 10 years ago – we've only got 67 companies SMS'd
- In the next round we've got approx. 2500 AOC/AMO certificates!
- Continuous improvement has to be part of the philosophy
- For every problem solved two more will arise
- It's worth the journey:
  - accident rates are decreasing
  - Testimonials demonstrate that organizations are satisfied with the new SMS framework

Questions?

Transport Canada Civil Aviation SMS website:

www.tc.gc.ca/civilaviation/sms