Adoption of Risk Assessment Model

A more defensible safety profile

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General Manager Operations Safety, Inspection & Safety Risk Management Division
Port Authority of New York and New Jersey

Speaker: David J. Crowner, A.A.E.
Senior Manager, Airfield Operations
Seattle-Tacoma International Airport
SMS, SRM and SRA Relationships

**Safety Risk Assessment** – A 5-step process by which the results of risk analysis are used to make decisions. A multidiscipline review and documentation conducted by a panel of experts, of a safety analysis of a system or proposed system change.

**Safety Risk Management** - A core activity of SMS, uses a set of standard processes to proactively identify hazards, analyze and assess potential risks, and design appropriate risk mitigation strategies.

**Safety Management System** - Systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.
SMS is like Weather
Knowing Existing Conditions is Good

- You can make some assumptions of what may occur
  - Anecdotal
  - Historical

Reviewing Temp, Dew point and barometric pressure as well as knowing clouds can help in drawing a general weather picture.
But the Forecast is Meaningful

- Planning
- Decision making
- Preparation
ACI Recommended airport practices 5.14 recommends that aerodrome operators should move away from the simple monitoring of compliance with rules and regulations to the development of a safety management system.
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- 139 Inspections
- FOD response
- Accident response
- Corrective actions
- Check Lists
- Accident Reporting
- Rules & Regulations

- Accident Data Collection
- Trending & tracking
- Root Cause Analysis
- FOD Detection
- Safety Assessments
- Increased Awareness
- Advisory Circulars
- Gap Analysis

Adapted from Flight Safety Australia – Nov-Dec 2007 by David Crowner
ACI Recommended airport practices 5.14 recommends that aerodrome operators should move away from the simple monitoring of compliance with rules and regulations to the development of a safety management system.

**EXISTING CONTROLS**
- 139 Inspections
- FOD response
- Accident response
- Corrective actions
- Check Lists
- Accident Reporting
- Rules & Regulations

**EXPANDED CONTROLS**
- Accident Data Collection
- Trending & tracking
- Root Cause Analysis
- FOD Detection
- Safety Assessments
- Increased Awareness
- Advisory Circulars
- Gap Analysis

**SAFETY EFFICIENCY**
- Risk Based Decisions
- Targeted Mitigation Measures
- Culture Shift toward prevention
- Continuous performance improvements
- Predictive Analytics
- Best Management Practices

Adapted from Flight Safety Australia – Nov-Dec 2007 by David Crowner
Safety in a Nutshell
FAA’s 4 SMS Components

- Safety Policy
  - Policy Statement
  - Roles and Responsibilities
  - Documentation
  - Organizational Processes

- Safety Risk Management
  - SRM Processes and Procedures
  - Hazard Management
  - Safety Risk Assessment
  - Triggers and Documentation
  - Safety Investigation

- Safety Assurance
  - Continuous Improvement
  - Reporting System
  - Data Management
  - Performance Monitoring
  - SMS Evaluation and Audit
  - Management Review

- Safety Promotion
  - Training and Education
  - Safety Communication
  - Safety Culture
  - Media and Branding
FAA’s 4 SMS Components

Safety Risk Management
- SRM Processes and Procedures
- Hazard Management
- Safety Risk Assessment
- Triggers and Documentation
- Safety Investigation
Not Reinventing the Wheel

We are already safety focused

- Assess existing practices
- Establish new practices
- Improve hazard communications
- Integrate people, processes, practices, and technology
We are expanding the wheel

- Assess existing practices
- Establish new practices
- Improve hazard communications
- Integrate people, processes, practices, and technology
Adding a Safety Risk Assessment Function

We are already safety focused

- Assess existing practices
- Establish new practices
- Improve hazard communications
- Integrate people, processes, practices, and technology
Safety Risk Management

Safety Risk Management (SRM) uses a set of standard processes to proactively identify hazards, analyze and assess potential risks, and design appropriate risk mitigation strategies.

At the core of a SMS is the ability to collect information on hazards, identify and quantify the associated risks through severity and likelihood and determine the corrective action (if any).

A tool to make more defensible safety decisions
SRA Application
A Functional Perspective

SRA Functional Application

Hazard Triage

Normal Ops COOP

SRA Application

WHAT

EVALUATE & INCORPORATE
Projects to address Safety issues
Safety Mitigation projects/improvements
All proposed capital improvements
from Safety perspective

FULL SRA ASSESSMENT
Existing Hazards/Risks
Introduced hazards or risks
Mitigation measures
Resulting severity/likelihood

EVALUATE & INCORPORATE
Specific & applicable
safety protocols
Safety Plan

EVALUATE
Safety SOPs, BMPs
Training protocols
Rules & Regs

Rules/Reg
Min Standards
SOPs/ACM

Findings
Required in AIP
Grant Application

New Master Plan
Safety Evaluation Section
Condition of ALP Approval

WHO

WHEN

WHAT

HOW

TECH ADVISORY COMMITTEE

FORMAL IN/EXTERNAL SRA PANEL
FAA, ATCT, Airport, SMEs

INTERNAL INFORMAL SRA PANEL
Airlines, Tenants, Airport

SAFETY COMMITTEE WORKING GROUP
NEW NORMAL
Course of Business
Day-to-day Ops

HAZARD/SAFETY SPECIALIST

© David Crowner - March, 2011

David Crowner - SMS Timeline & SRA pyramid vsd 3/7/2011
Simple Safety Analysis
Internal/informal

PRELIMINARY SAFETY ANALYSIS – Lighted X placement RWY 16L closure
SMS review, facilitation, & Principal Evaluator: David Crowner
Note taker, Scribe: Crowner
Evaluation Date: April 13, 2012

Assessment Team/Panel: Pat Clancy - Sponsor
Guiding Principles/Assumptions:
- Utilizing RWY 16L/34R as a taxiway for heavy aircraft is safer than these aircraft operating around construction areas on taxiway B and W.
- PPR departures allowed only in North Flow

Existing Conditions/System Description: The Airport will be replacing multiple concrete panels throughout the Airport which will impact taxiway B and Taxiway W requiring aircraft to maneuver around this construction and transiting between Taxiway B to taxiway W. Additionally, there is insufficient room and wingspan clearance for “heavy”, wide-body aircraft to make such maneuvers. Concurrent with, but separate from, the Airport’s project, the FAA will be replacing 16L localizer which will result in the closure of this runway for a 37 day period, thus providing an opportunity to taxi wide-body aircraft onto the runway avoiding construction issues. In order to accommodate long-haul, heavy aircraft operations a 60 minute PPR will be allowed in North Flow operations.

Operating the Runway as a taxiway requires the placement of the X closure marker to be placed in a location to allow for use and crossing of the runway, but also provide an effective visual cue to landing aircraft. FAA AC 150/5370-2F states that closure markers should be placed “at each end of the runway directly or as near as practicable to the runway designation numbers.”

Change Proposal/Objective: Determine best and safest location and operational parameters for the placement of closure markers (lighted Xs) that is as near as practicable to the runway designation numbers but which allows for effective taxiing, runway exit, entry and crossing operations and operational continuity.

Construction overview - South

Construction overview - North

Hazard Analysis:

<table>
<thead>
<tr>
<th>#</th>
<th>Potential Hazardous Condition</th>
<th>Risk or Consequence</th>
<th>Risk Assessment</th>
<th>Possible Mitigation Measures</th>
<th>Required Plan</th>
<th>Responsible Party</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Insufficient room and wingspan clearance of wide-body aircraft around construction areas.</td>
<td>Collision between aircraft, construction equipment, vehicles and/or personnel.</td>
<td>3 A H20</td>
<td>1. Utilize runway 16L/34R as a taxiway for wide-body aircraft. 2. Route all wide-body aircraft around construction via Runway 15L/34R.</td>
<td>L-10</td>
<td>Pat Clancy</td>
</tr>
<tr>
<td>2</td>
<td>Unauthorized departure at End of 34R.</td>
<td>Collision with other traffic taxing or crossing on RWY. Collision with lighted X or other equipment on RWY.</td>
<td>3 C M14</td>
<td>1. Close TWY B and place barriers at entrance to 34R (see line above) &amp; require all run-up operations to taxi to via runway. (see line above) 2. Turn off all Runway 16L/34R edge lighting - use Centerline lights at lowest setting 3. Airport Ops and ATCT to confirm edge lights off 4. Provide ATCT and Chief Pilot briefing and notices</td>
<td>L-10</td>
<td>Pat Clancy</td>
</tr>
<tr>
<td>3</td>
<td>Inadvertent intersection departure on RWY 34R at taxiway Q</td>
<td>Collision with traffic taxing on or crossing RWY. Collision with lighted X or equipment on RWY</td>
<td>3 E L-9</td>
<td>1. Block out lead-on line 2. Provide briefing to ATCT controllers to increase pilot advisory and awareness 3. Provide Chief Pilot with briefings and notices</td>
<td>L-7</td>
<td>Pat Clancy</td>
</tr>
</tbody>
</table>
Safety Risk Assessment Panel

Internal/External & Formal

6 Mitigation Plan
The mitigation action plan identifies the item to be investigated and/or deployed, the SEA responsible party for implementing the investigation, documentation, reporting, and the completion date.

<table>
<thead>
<tr>
<th>#</th>
<th>Mitigation</th>
<th>Person Responsible</th>
<th>Proposed Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Provide operational and legal expertise do...</td>
<td>David Crowner</td>
<td>March 21, 2012</td>
</tr>
<tr>
<td>2</td>
<td>Provide operational and legal assistance...</td>
<td>David Crowner</td>
<td>March 21, 2012</td>
</tr>
<tr>
<td>3</td>
<td>Investigate the impacts to the existing plan</td>
<td>Pat Casey and David Crowner</td>
<td>January 1, 2012</td>
</tr>
<tr>
<td>4</td>
<td>Maintain markings and lighting on Taxiway A as...</td>
<td>Pat Casey</td>
<td>Not applicable</td>
</tr>
<tr>
<td>5</td>
<td>Change designation of Taxiway A to Taxiway Whiskey...</td>
<td>Pat Casey</td>
<td>June 30, 2012</td>
</tr>
</tbody>
</table>

Table 3 - Mitigation Plan

APPENDIX A - Airport Diagram
Got Risk?

SRM, SRA, and FAA Compliance

Overview of FAA Order 5200.11

5200.11 Desk Reference

Construction AC

Forms

SAS
SRA Report
CSPP
Compliance Doc
Project Proposal Summary

Advisory Circular

U.S. Department of Transportation
Federal Aviation Administration

Subject: Operational Safety on Airports During Construction

Date: 9/79/11
Initiated by: AAS-100
AC No: 150/5370-2F

1. Purpose. This AC sets forth guidelines for operational safety on airports during construction.


3. When This AC Applies. This AC assists airport operators in complying with Title 14 Code of Federal Regulations (CFR), Part 139, Certification of Airports (Part 139). For those certified airports, this AC provides one way, but not the only way, of meeting those requirements. The use of this AC is mandatory for those airport construction projects receiving funds under the Airport Improvement Program (AIP) or the Passenger Facility Charge (PFC) Program. See Grant Assurance No. 34, "Policies, Standards, and Specifications," and PFC Assurance No. 9, "Standard and Specifications." While we do not require non-certified airports without grant agreements to adhere to these guidelines, we recommend that they do so to help these airports maintain operational safety during construction.

4. Principal Changes:
   a. Construction activities are prohibited in safety areas while the associated runway or taxiway is open to aircraft.
   b. Guidance is provided in incorporating Safety Risk Management.
   c. Recommended checklists are provided for writing Construction Safety and Planning Plans and for daily inspections.

5. Reading Material Related to this AC. Numerous ACs are referenced in the text of this AC. These references do not include a revision letter, as they are to be read as referring to the latest version. Appendix 1 contains a list of reading material on airport construction, design, and potential safety hazards during construction, as well as instructions for obtaining these documents.

Michael J. O’Donnell
Director of Airport Safety and Standards
Safety Assessment Screening (SAS) Form 1

<table>
<thead>
<tr>
<th>Safety Assessment Screening for Projects (SAS-1)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5. Was the proposal reviewed by CE/AAA?</strong></td>
</tr>
</tbody>
</table>
| a. Yes  
| b. Case Number:  
| c. Determination Date:  
| d. CE/AAA review comments attached.  
| e. CE/AAA review indicates an objection to the proposal. |
| **6. A review of the proposal indicates the following:** (Select all that apply) |
| a. ARP System Safety Impact Checklist  
| b. The Proposed Action may affect aviation safety.  
| c. The Proposed Action may affect air traffic operations.  
| d. The Proposed Action may affect navigational aids.  
| e. The Proposed Action may impact TERPS surfaces.  
| f. Other Safety Impacts:  
| g. The CE/AAA review indicates that an SRM panel is necessary.  
| h. The Safety Impact Checklist indicates that an SRM panel is necessary.  
| i. An SRM panel is not required. No further review is required. (Complete and sign page 3, discard page 2). |
| **7. SRM Finding of No Increased Risks** |
| The proposed action was reviewed with respect to standard to see if it would affect other users of the airport. The review was conducted with appropriate FAA personnel, airport operators, and stakeholders. (Complete and sign page 3, discard page 2). |
| **8. SRM Panel and Findings** |
| a. Report date:  
| **9. Initial Risk Determination** |
| a. Low Initial Risk. Attach supporting documentation.  
| b. Medium Initial Risk. Attach detailed explanation of the proposed action.  
| c. High Initial Risk. The project will be reviewed by the ARP Safety Review Board. |
| **10. Final Risk Determination** |
| a. Low Risk. Attach detailed explanation of the proposed action.  
| b. Medium Risk. Attach detailed explanation of the proposed action.  
| c. High Risk. The project proposal with risk mitigation measures. |

<table>
<thead>
<tr>
<th>Airport Certification and Acceptance</th>
</tr>
</thead>
<tbody>
<tr>
<td>As a duly authorized representative of the airport identified above, I hereby certify that I have reviewed and understand the hazards and mitigation measures identified in the proposed action. (Complete and sign page 3, discard page 2).</td>
</tr>
<tr>
<td><strong>13. FAA SRM Approval</strong></td>
</tr>
<tr>
<td>Hazards identified and analyzed using standard procedures and processes in accordance with the FAA Order 5200.11. Mitigation measures, including draft NOTAM requirements, if necessary, are attached and are included with the formal FAA project approval action. These measures help ensure safety levels are maintained at acceptable levels both during and after the proposed construction and non-construction airport changes.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name and Title</th>
<th>Date</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAA Office</td>
<td>Name and Title</td>
<td>Date</td>
</tr>
<tr>
<td>SMS ID:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Our Interpretation of FAA Process
SRA Triggers:

a. Development of and updates to airport planning, environmental, engineering, construction, operations, and maintenance standards published in ACs.
b. FAA review of new or revised ALPs.

c. Construction project coordination, review, or approval for Federally obligated airports, including CSPPs. Or projects which are located on-airfield of P-139 Airports *(currently only Large Hubs)

d. Approval of Part 150 Noise Compatibility Program measures that could affect aviation safety (such as noise abatement departure procedures).
e. Approval of requests for project-specific Modifications of Standards (excludes AC 150/5370-10).

f. Non-construction changes, including runway and taxiway designations, airfield pavement marking and signage (excluding normal maintenance), runway categories (design aircraft), and in coordination with other LOBs for planned approach or departure procedure changes.

g. Modification or update to any action that could represent a material change from a previous SRM review or Safety Assessment.

h. FAA decisions on operational or safety-related issues (complex airfield projects, complex planning study alternative analysis, etc.)
Actions and Information Sharing
Non-Construction:

f. Non-construction changes, including runway and taxiway designations, airfield pavement marking and signage (excluding normal maintenance), runway categories (design aircraft), and in coordination with other LOBs for planned approach or departure procedure changes.
Actions and Information Sharing

Construction:

OE/AAA Assessment (7460)

If Panel is required, include panel facilitation in Scope

c. Construction project coordination, review, or approval for Federally obligated airports, including CSPPs. Or projects which are located on-airfield of P-139 Airports *currently only Large Hubs)

Project Scope Development and Pre-design

Plans and Specifications 25 -70%

Project Proposal Summary

Construction Safety Phasing Plan (CSPP)

Contractor Safety Plan

Compliance Doc.

How Contractor Will apply Project Proposal Summary

CONSTRUCTION

Master Plan or ALP Update

Alternatives from Master Plan

Comparative Safety Assessment

Operational Safety Assessment

ARP SMS Desk Ref – Par 3, Sec 6.3.3

FAA SMS Desk Ref

Design or Plan Out Hazards

Comparative Safety Assessment

Operational Safety Assessment

FAA SMS Desk Ref

24
Actions and Information Sharing Post SAS:

The Proposed Action may:
- Deviate from applicable FAA standards
- Increase aviation safety risks, with existing controls in-place
- Affect aviation operations with existing controls in-place
- Affect navigational aids
- Impact TERPS surfaces
- Other safety impact:

NCP includes:
- Preferential runway systems
- Use of flight procedures
- Noise abatement takeoff and landing procedures

Do not include the use of flight procedures that will be implemented landside or off-airport, such as:
- Land Use controls
- Noise monitoring and acoustical treatments

No further SRM Requirement.

Complete and Submit SAS Form

Yes

No

No further SRM Review is required

1. Describe System
2. Identify Hazards
3. Analyze Risk
4. Assess Risk
5. Mitigate Risk

Attach to SAS 1

Complete SRMD/ Safety Risk Assessment (SRA) Report

Airport Risk Review and Approval

Airport Legal Review and Approval

Sign off Report

150 NCP or NEMs approval

No further SRM Requirement

Complete and Submit SAS Form

Yes

No

System Safety Impact Checklist

Project SOW

SRM/ SRA Panel Needed?

Airport Funded Panel

FAA Funded Panel

FAA Facilitates

Conduct SRA

Facilitator Hired?

ARP Regional Office and Airport Sponsor Select Panel Members

Pre Meeting Logistics

Pre Meeting Documentation

ARP SMS Overview
IDLE FAA Course 06000005
ARP SRM Facilitation, IDLE
Consult with ARP Mgr & Regional SMS

Yes

No

Required Training

ARP SMS Desk Ref – Par 2, Sec 6.3

Revise Proposal

NCP includes:
- Preferential runway systems
- Use of flight procedures
- Noise abatement takeoff and landing procedures

Do not include the use of flight procedures that will be implemented landside or off-airport, such as:
- Land Use controls
- Noise monitoring and acoustical treatments

No further SRM Review is required
Lingering Questions:
If a Panel is deemed necessary?

• How can I include in Scope of Work ahead of determination of Panel decision
• How soon after submission to FAA will I know if a panel will be needed
• Can a Consultant facilitate their own SRA panel?
• Can another airport facilitate a panel for another airport – Peer to Peer facilitation
• What if I can’t get everyone together at same time. – FAA Availability and commitment to process?
• What if ATO or ARP or other FAA agency disagrees with outcome – Will FAA respect the process?
Lingering Questions:
If a Panel is deemed necessary? - continued

• How long does the SAS-1/2 /OEAAA review take?
• What is the Timeline/deadline?
• Lead times for FAA participation?
• Will FAA coordinate panel attendance internally (including ATO) or is Airport expected to coordinate?
• What is the appeal process
• Our Legal departments may have to review before we sign.
• What if FAA is Assigned Mitigation (Action) Items in the SRA?
Lingering Questions:
Will the FAA Pay for Panel Costs?

- How (what mechanism) will FAA pay/reimburse (AIP/PFC)
- What if project is simply located on airport or is a non AIP or PFC project?
- What if ATO Initiates SRA?
- Will FAA cover resulting Mitigation Costs

Why does ATO refer to processes differently then ARP?

When can we expect the SMS regulations to be final and adopted.
More Questions:

How many Safety evaluations are there and how/where/when do they fit in process?

- OE/AAA
- SAS 1, 2, 3
- Preliminary Hazard Assessment
- Comparative Safety Assessment
- Operational Safety Assessment
- System Safety Impact Checklist
Avoidance is best safety measure:
SRA Process

5 STEPS

1. Describe the System
2. Identify Hazards
3. Analyze the Risk
4. Assess the Risk
5. Mitigate the Risk

Monitor the System
SRA Preparation

Be Appropriately Trained and Knowledgeable
- ARP SMS Overview
- IDLE FAA Course 06000005
- ARP SRM Facilitation, IDLE
- Know Subject Matter (Airport Ops, 150 Noise, Master Plan)
- SRA Processes
- Facilitation Techniques

Meet with Regional ARP/ATO/SMS Coordinators
- Scope of Work
- CSA, PHA, OSA Review
- Issues of Concern
- FAA LOB Alignment
- Panel Members
- FAA Availability, Scheduling, and Coordination

Align Objectives and Priorities
- Reach Consensus on:
  - Deliverables
  - Agenda
  - Panel Participants
  - Schedule, Format, Resources, Timelines
  - Assignments and Expectations

Meet with Airport
Applicable
- Issues of Concern
- Panel Members
- Airport Staff Availability and Scheduling Coordination
- Overall SRA and Logistics
SRA Preparation

Logistics
- Location and Room Layout
- Lunch Provided or Not
- Duration (4 or 8 hours)
- One Day or Two

Review and Determine Existing Controls
- Advisory Circulars
- Desk Reference Appendix G
- FAR Part 139, 77, 150
- ACM, SMGCS Plan, WHMP
- Rules and Regs. / Policies
- Min Standards / BMPs

Prepare Preliminary Assessment of Hazards
Quick List of Potential Hazards / Consequences to Assist in Prompting Discussion

Frame the Day
- Overview of subject /issue statement
- Ground Rules
  - Look Ahead, Don’t Jump Ahead
  - Conflict is Good, but Keep it Civil
  - Park Your B.M.W.
- Understanding of Terms
  - Hazard, Cause, Consequence
  - Keep it Credible
  - Quantitate vs. Qualitative data

Prepare and Assemble Reference Packet

Set Agenda and Assign Tasks
- Packet Preparations
- Introductions
- Presenters
  - Introductions
  - SRM / SMS / SRA Relationship
  - Frame the Day
- Note Taker / Scribe

Applicable
- Advisory Circulars
- Statistics / Data
- Previous SRA Findings
- Supporting or Refuting Articles or Documents
Frame the Day

- Objectives
- House rules
  - Park your B.M.W.
  - Please – no sidebars; wait for breaks
  - listen and appreciate others; wait until outside before trashing someone
  - No cell phones
  - Tension is good but keep it civil
  - consider qualitative over quantitative data
  - Look ahead don’t jump ahead
  - think in terms of “credible” risks
  - No computers (unless retrieving data)

- Roles and Responsibilities
- Process understanding and adherence (respect the process)
<table>
<thead>
<tr>
<th>Hazard</th>
<th>Risk</th>
<th>Risk Assessment</th>
<th>Mitigation</th>
<th>Residual Risk (if any)</th>
<th>Severity</th>
<th>Likelihood</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stale information</td>
<td>Not all information is available for pilots due to stale information</td>
<td>Risk - runway excursion</td>
<td>1 - people</td>
<td>Catastrophic</td>
<td>Extremely improbable</td>
<td>Medium</td>
</tr>
<tr>
<td>2</td>
<td>Relevant information</td>
<td>Reduced efficiency</td>
<td>Risk - Coop</td>
<td>2 - people</td>
<td>Minor</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Passur fails</td>
<td>Reduced efficiency</td>
<td>Risk - Coop</td>
<td>2 - people</td>
<td>Minor</td>
<td>4</td>
<td>1</td>
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</table>

**Winter Operations Communications and Information Dissemination**

- Current winter weather issues/concerns
- Incidents/Accidents
- Current winter communications procedures
- Number of RW excursions/incursions (total & during winter operations)

*Assess The Risk*

*Describe System*

1. Winter Operations
2. Communications
3. Information Dissemination
## Winter Operations Communications and Information Dissemination

- Current winter weather issues/concerns
- Incidents/Accidents
- Current winter communications procedures
- Number of RW excursions/incursions (total & during winter operations)

### Hazard Risk

<table>
<thead>
<tr>
<th>#</th>
<th>Hazard</th>
<th>Severity</th>
<th>Likelihood</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stale information</td>
<td>Medium</td>
<td>Remote</td>
<td>High</td>
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<tr>
<td>2</td>
<td>Relevant information (information needs to be relevant to the users)</td>
<td>Minor</td>
<td>Remote</td>
<td>Medium</td>
</tr>
<tr>
<td>3</td>
<td>Passur fails</td>
<td>Minor</td>
<td>Remote</td>
<td>Low</td>
</tr>
</tbody>
</table>

### Assess The Risk

1. **Describe System**
2. **Identify Hazards**
3. **Assess Risk**
   - Treat Risk

---

---
Assess The Risk

Winter Operations Communications and Information Dissemination

- Current winter weather issues/concerns
- Incidents/Accidents
- Current winter communications procedures
- Number of RW excursions/incursions (total & during winter operations)

Identify Hazards

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<td>2</td>
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<tr>
<td>3</td>
<td>Passur fails</td>
</tr>
</tbody>
</table>

Preliminary Hazard List (PHL)

Brainstorming -

- Provides an initial overview of the potential hazards in the overall flow of the operation
- Provides a broad, but usually not deep, hazard assessment
- Considers the hazards inherent to aspects of an operation, without regard to risk
- Serves to focus and prioritize follow-on hazard analyses in higher risk operations
### Assess The Risk

**Winter Operations Communications and Information Dissemination**
- Current winter weather issues/concerns
- Incidents/Accidents
- Current winter communications procedures
- Number of RW excursions/incursions (total & during winter operations)

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Assess The Risk

Winter Operations Communications and Information Dissemination

- Current winter weather issues/concerns
- Incidents/Accidents
- Current winter communications procedures
- Number of RW excursions/incursions (total & during winter operations)

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### Assess the Risk

**Risk**: Composite of predicted severity and likelihood of outcome or effect of the hazard

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### Assess The Risk

1. **Identify Hazards**
2. **Analyze Risk**
3. **Assess Risk**
## Analyze risk - Severity

<table>
<thead>
<tr>
<th>Severity</th>
<th>1 - People</th>
<th>2 – COOP Continuity of Operations</th>
<th>3 - Environmental</th>
<th>4 – Perception/Reputation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal</td>
<td>No to slight injury; not recordable</td>
<td>Does not result in disruptive event; does not threaten life or property</td>
<td>No environmental impact; no hazardous product/materials</td>
<td>No loss of public confidence</td>
</tr>
<tr>
<td>Minor</td>
<td>Recordable injury, first aid required</td>
<td>Can be classified as a NIMS Incident</td>
<td>Non Reportable - Minimal volume of hazardous material and location and/or conditions allow for containment.</td>
<td>May be lowered, but public finds situation acceptable</td>
</tr>
<tr>
<td>Major</td>
<td>Reportable injury</td>
<td>Can be classified as a NIMS Incident</td>
<td>Reportable</td>
<td>Significantly lowered with high profile media coverage</td>
</tr>
<tr>
<td>Hazardous</td>
<td>Mass Casualty Incident (MCI) or 5 to 10 injuries/transport</td>
<td>Can be classified as a NIMS Disaster</td>
<td>Reportable</td>
<td>Shaken to the point where significant numbers of the public will not fly on a particular aircraft or airline</td>
</tr>
<tr>
<td>Catastrophic</td>
<td>MCI or 10 or more injuries/transport</td>
<td>Can be classified as a NIMS Catastrophe</td>
<td>Significant volume of hazardous product/material</td>
<td>Shaken to the point where significant numbers of the public do not use the airport</td>
</tr>
</tbody>
</table>
## Analyze risk - Likelihood

### Likelihood Classification Chart

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequent</strong></td>
<td></td>
</tr>
<tr>
<td><strong>A</strong></td>
<td>- Likely to occur once a day or multiple times per week</td>
</tr>
<tr>
<td></td>
<td>- Expected to occur continuously within the system</td>
</tr>
<tr>
<td><strong>Probable</strong></td>
<td></td>
</tr>
<tr>
<td><strong>B</strong></td>
<td>- Likely to occur multiple times per year or once per month</td>
</tr>
<tr>
<td></td>
<td>- Expected to occur regularly within the system</td>
</tr>
<tr>
<td><strong>Remote</strong></td>
<td></td>
</tr>
<tr>
<td><strong>C</strong></td>
<td>- Likely to occur once a year or to occur multiple times within 5 years</td>
</tr>
<tr>
<td></td>
<td>- Occurrence is unlikely but possible</td>
</tr>
<tr>
<td><strong>Extremely Remote</strong></td>
<td></td>
</tr>
<tr>
<td><strong>D</strong></td>
<td>- Likely to occur once in every 5 years or to occur multiple times within 10 years</td>
</tr>
<tr>
<td></td>
<td>- Occurrence is conceivable but highly unlikely</td>
</tr>
<tr>
<td><strong>Extremely Improbable</strong></td>
<td></td>
</tr>
<tr>
<td><strong>E</strong></td>
<td>- Likely to occur only once in 10 to 100 years</td>
</tr>
<tr>
<td></td>
<td>- Occurrence is almost impossible</td>
</tr>
</tbody>
</table>
ASSESS RISK

Severity and likelihood are used to determine associated risk using predictive risk matrix.

<table>
<thead>
<tr>
<th>Severity</th>
<th>Minimal 5</th>
<th>Minor 4</th>
<th>Major 3</th>
<th>Hazardous 2</th>
<th>Catastrophic 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequent A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Probable B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remote C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extremely Remote D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extremely Improbable E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

High Risk
Medium Risk
Low Risk
### Which Risk Matrix?

#### Airport

<table>
<thead>
<tr>
<th>Severity Likelihood</th>
<th>Minimal</th>
<th>Minor</th>
<th>Major</th>
<th>Hazardous</th>
<th>Catastrophic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequent A</td>
<td>L5</td>
<td>M13</td>
<td>H20</td>
<td>H22</td>
<td>H25</td>
</tr>
<tr>
<td>Probable B</td>
<td>L4</td>
<td>M12</td>
<td>M15</td>
<td>H21</td>
<td>H24</td>
</tr>
<tr>
<td>Remote C</td>
<td>L3</td>
<td>L8</td>
<td>M14</td>
<td>M17</td>
<td>H23</td>
</tr>
<tr>
<td>Extremely Remote D</td>
<td>L2</td>
<td>L7</td>
<td>L10</td>
<td>M16</td>
<td>M19</td>
</tr>
<tr>
<td>Extremely Improbable E</td>
<td>L1</td>
<td>L6</td>
<td>L9</td>
<td>L11</td>
<td>M18</td>
</tr>
</tbody>
</table>

#### FAA ARP / FAA ATO

<table>
<thead>
<tr>
<th>Risk Likelihood</th>
<th>Risk Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Catastrophic A</td>
</tr>
<tr>
<td>Frequent</td>
<td>5</td>
</tr>
<tr>
<td>Occasional</td>
<td>4</td>
</tr>
<tr>
<td>Remote</td>
<td>3</td>
</tr>
<tr>
<td>Improbable</td>
<td>2</td>
</tr>
<tr>
<td>Extremely Improbable</td>
<td>1</td>
</tr>
</tbody>
</table>

Airline (Example from AC 120-92A)
### Winter Operations Communications and Information Dissemination

- Current winter weather issues/concerns
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### Assess The Risk

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<th>Risk</th>
<th>Risk Assessment</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Severity</td>
</tr>
<tr>
<td>1</td>
<td>Stale information</td>
<td>Not all information is available for pilots due</td>
<td>1 - people</td>
</tr>
<tr>
<td></td>
<td></td>
<td>to stale information Risk - runway excursion</td>
<td>Catastrophic</td>
</tr>
<tr>
<td>2</td>
<td>Relevant information (information needs to be relevant to the</td>
<td>Reduced efficiency</td>
<td>2 - Coop</td>
</tr>
<tr>
<td></td>
<td>users)</td>
<td></td>
<td>Minor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4 Reputation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Minor</td>
</tr>
<tr>
<td>3</td>
<td>Passur fails</td>
<td>Reduced efficiency</td>
<td>2 - Coop</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Minor</td>
</tr>
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<td></td>
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<tr>
<th>#</th>
<th>Hazard</th>
<th>Risk</th>
<th>Risk Assessment</th>
<th>Mitigation</th>
</tr>
</thead>
</table>
| 1  | Stale information                        | Not all information is available for pilots due to stale information runway excursion | 1 - people Catastrophic, Extremely Improbable | 1- Build a Gap (BAG) to conduct an assessment of the runway and a friction test if necessary.  
2- Implement a single pass operations configuration for runway snow clearance |
| 2  | Relevant information (information needs to be relevant to the users) | Reduced efficiency                         | 2 - Coop Minor, Remote | 1- Review system capabilities to make possible modifications and customizations  
2- Develop a Standard Operating Procedure (SOP) for data validation |
| 3  | Passur fails                             | Reduced efficiency                         | 2 - Coop Minor, Extremely Remote | 1- Contingency plans are in place based on past practice but plans need to be documented. SOP or SOG (memorize the plan)  
2- Schedule and arrange table top exercise(s) to educate and train staff on alternative plans  
3- Mitigate emergency of a snow event through planning and training (see above) |
TREAT THE RISK

Mitigation Plan

Identify actions, controls or other measures to reduce the likelihood of consequences associated with a hazard. Reduce the predicted risk level to medium or low.

<table>
<thead>
<tr>
<th>#</th>
<th>Mitigation</th>
<th>Person Responsible</th>
<th>Proposed Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>A. Build a Gap (BAG) to conduct an assessment of the runway and a friction test if necessary. &lt;br&gt; B. Implement a single pass operations configuration for runway snow clearance</td>
<td>David Crowner</td>
<td>TBD</td>
</tr>
<tr>
<td>2.</td>
<td>A. Review system capabilities to make possible modifications and customizations &lt;br&gt; B. Develop a Standard Operating Procedure (SOP) for data validation</td>
<td>David Crowner</td>
<td>TBD</td>
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<tr>
<td>3.</td>
<td>A. Contingency plans are in place based on past practice but plans need to be documented. SOP or SOG &lt;br&gt; B. Schedule and arrange table top exercise(s) to educate and train staff on alternative plans &lt;br&gt; C. Mitigate emergency of a snow event through planning and training (see above)</td>
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<td>1 - people Catastrophic 1 - Extremely Improbable</td>
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<td>Medium</td>
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<td>2</td>
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<td>Reduced efficiency</td>
<td>2 - Coop Minor 4 - Reputation Minor</td>
<td>Remote</td>
<td>1- Review system capabilities to make possible modifications and customizations 2- Develop a Standard Operating Procedure (SOP) for data validation</td>
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<td>Reduced efficiency</td>
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SRA Recommendations:

• Choose diverse but complementary panel members
• Facilitator should be independent of issue(s) but understand the subject (Can the FAA be independent of the issue?)
• Allow for conflicting positions but guide discussion back to consensus
• Keep consequences credible
• Be faithful to the process

SRA 5 Steps

1. Describe System
2. Identify Hazards
3. Analyze Risk
4. Assess Risk
5. Treat Risk
6. Monitor Solutions
Although SMS requires integration:

- No SMS alignment within FAA
  - ATO and Airports – Who’s on first to initiate & perform SRAs/SRMs
  - No common language/reference
  - SMS & Safety Enhancements to 139 NPRMs not coordinated

- No provisions or process to share data across hazard databases

- No requirement for Airlines or ground handlers to report hazards/incidents to Airport

- No protection from “Public Information” statues
Is FAA Ready, Willing, and Able?

- ATO and Airport SRAs / SRMs - conflicting and overlapping assignments, roles, and responsibilities.
- Will FAA defer safety to the SRA process in lieu of their “intuition” or expert opinion.
- FAA ARP does not have sufficient staff or resources to support participation or facilitation of SRAs, including their review, and approval.
- No comprehensive method exists to ensure continuity of findings among airport SRAs or their associated mitigation(s).
RECOMMENDATIONS:

- Airports are Change Agents and should lead all Safety efforts based upon FAA established guidelines.
- Airports should utilize existing methods to require SMS compliance and data sharing:
  - Minimum Standards for 3rd party ground handlers
  - Contracts and Leases/Use Agreements
- Align Airport, Airline, Ground Hander programs and requirements (ISAGO?).
- Ensure continuity between databases.
- Provide “benchmark” SRA protocols to minimize redundant efforts.

Reactives (Past) | Proactive (Present) | Proactive (Future)
SEA’s Safety Risk Management Efforts

Formal SRAs:
- Movement/Non-movement area configuration for taxiway Alpha
- Winter operations communications and Information dissemination
- Runway 16-34C planning and design – hotspot mitigation
- Consistency of ramp markings
- Wildlife Hazard Management Plan at SEA

Preliminary Hazard Assessments:
- Dual Taxilanes around North Satellite
- Cargo 2 group VI aircraft use
- Lighted X placement RWY 16L closure
SEA Benefits - The Internal “Sell”

- Formalizes safety program
- Ensures regulatory compliance
- Reduces risks
  Hold staff and tenants accountable for safety performance
- Establishes safety performance goals
- Facilitates safety ownership through participation

A safer environment =
  - Improved opportunities =
    - Increased revenue

“A safer workplace is a result of identifying hazards and eliminating or reducing the risk to an acceptable level”
Our Successes:

- 787-SAFE phone number established
- Rules and Regs. changed – S.AF.E program
- ISAGO certification required for all applicable GSPs
- FOD assignments/walks conducted
- ABM ramp cleaning contracted
- ADM SMS ASR activities assigned
- Safety Newsletters published
- NPRM comments delivered
- GAO briefing completed
- Completed 4 SRAs
SEA Safety Promotion Efforts

- Safety Catch Award
- 787-Safe Bumper and Phone Stickers
- Safe Operations Card (SOC)
- SMS Quick Reference Guide
- Quarterly Newsletter
Final Thoughts

Strongly Support SMS initiative

“Safe Does not Equal Risk Free”

SMS

• is coming to Part 139 airports
• makes good business sense
• reinforces and enhances existing safety objectives
• is the Standard of Care