## MINNEAPOLIS-ST. PAUL INTERNATIONAL AIRPORT

# SAFETY MANAGEMENT SYSTEM MANUAL



# METROPOLITAN AIRPORTS COMMISSION

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#### Metropolitan Airports Commission MSP Airport Safety Management System Manual

## 1 SAFETY POLICY STATEMENT



## 2 PREFACE

#### 2.1 MAC Safety Philosophy

The Metropolitan Airports Commission (the MAC) believes we create safety by building our capacity for resilience, understanding our critical risks, and formalizing how we approach operational systems and interfaces.

At the center of the way we approach safety, there are six principles we use to guide our safety vision:

- 1. People make mistakes: Error is inevitable, but we can learn how to make it less likely.
- 2. We can create systems and controls that allow us to fail safely: We can build resilience so that our operations continue to work well even when things aren't perfect.
- 3. **Learning is essential:** We use purposeful tools to make sure we learn from success as well as failure.
- 4. Blame doesn't make us safer, but accountability does: We're focused on clear expectations for safety performance and holding ourselves accountable at all levels.
- 5. **Systems influence actions:** We recognize that few things happen in isolation, and our work environment and organizational design shape behavior.
- 6. **The way we respond to failure matters:** We respond to imperfect performance with a curious mindset.

SMS helps us integrate all of these principles in a systematic approach.

#### 2.2 Components of our SMS

The MAC SMS conforms to the regulatory requirements of 14 CFR Part 139 Subpart E and is built on four foundational components and supported by the culture of safety and care we create here.





The MAC has developed our SMS with a manual separate from, but in support of, our Airport Certification Manual. Our philosophy is that safety is embedded in everything we do, including the non-operational components of MAC's work.

An SMS is a formal, top-down, organization-wide approach to managing safety risk and assuring the effectiveness of safety risk controls. It includes systematic procedures, practices, and policies for managing safety risk.

At the MAC, our Safety Management System is not only about regulatory compliance; it is how we ensure safety performance within a culture that is curious about risk and the complex systems we work within. The primary components we use to describe our SMS functions include:

**Safety Policy** 

What we're doing, how we do it, who does what, and how we'll know it's working?

#### Safety Risk Management

What are our critical risks in our patterns of work, how can we address them, and who gets to decide what risk is acceptable?

#### Safety Assurance

Are we doing what we said we would? Is it doing what we thought it would?

#### **Safety Promotion**

How do we train people to see risk and make informed decisions? How can we build risk fluency to support our culture and improve safety performance?

WHAT EACH SMS COMPONENT DOES

This SMS manual is supported by Appendices that provide additional guidance and procedures for meeting safety policies and processes. Appendices are internal documents and are not a part of the FAA-approved manual system.

Because we view safety as something we continuously practice, this manual is intended to be continuously reviewed and improved. If you have suggestions, changes, or questions about the MAC SMS manual or Appendices, the SMS Manager is the primary point of contact.

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#### 2.3 Scope and Applicability of SMS

The MAC SMS applies to all airfield operations regulated under 14 CFR part 139. SMS processes should be applied to interfaces with MAC operations that may not be directly regulated by 14 CFR Part 139 but otherwise affect airfield operations.

Our systematic approach to safety through the SMS means that these processes can be voluntarily applied to any aspect of MAC's operations outside the regulated operation. SMS support is available through the MAC SMS Manager's office, but voluntary, non-regulated safety performance is not evaluated within the scope of MAC's Part 139 certificate requirements.





## **3** INTRODUCTION

#### 3.1 This SMS Manual

This Safety Management System Manual (SMS) works in concert with the MAC's Policies and Procedures, Training Programs, Maintenance Manuals, Airport Certification Manual, Standard Operating Procedures, and applicable regulatory manuals. Our manuals work together like this:



GENERAL MANUAL SYSTEM OVERVIEW

#### *3.1.1 Document Control and Availability*

The MAC Manager, Airport Safety Management System (SMS Manager), maintains and controls this SMS Manual. The most current version of the SMS Manual is available to all MAC employees via the MACPoint (internal SharePoint) system. Digital, read-only access can also be granted by the SMS Manager to third-party contractors, tenants, and regulators as needed.

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#### *3.1.2 Review and Continuous Improvement*

This manual is a living document and reflects the MAC's commitment to continuous improvement of our operations, services, safety, and culture. The SMS Manager coordinates changes to this document and ensures a comprehensive review of this document at least every 12 calendar months. The annual review covers, at a minimum:

- applicability of manual revision suggestions
- updates to personnel and safety roles and responsibilities
- safety performance objectives and targets
- integration of regulatory changes that affect the SMS

The SMS Manager is also responsible for reviewing safety performance (which we support through information in the SMS Manual Appendices) with the Accountable Executive and other leadership personnel at least every 12 calendar months.

Any changes to the MAC's SMS are reviewed as part of our change management process (described in this manual), communicated in advance, trained as appropriate, and recorded in a change log. Change communication is verified electronically via read receipt tracking and training records when training is appropriate.

Revisions to our Safety Management System are issued when changes in regulations, MAC policies or procedures, or operational updates are required. Suggestions for changes may also be made through the SMS reporting process, by contacting the SMS Manager, or by speaking with any member of MAC leadership.

Each manual revision is numbered, and each revised page includes the revision number and revision date in the header of each page. When a page has been revised, revision marks show where or what has been changed.





## 4 SAFETY POLICY AND OBJECTIVES

We manage safety and resilience as we do for other elements of our business – through proactive efforts and by building teams and systems that support our commitment to safe, effective, and compliant operations. This manual describes the policies and processes necessary to meet the MAC's safety performance objectives.

#### 4.1 Safety Roles, Responsibilities, and Performance

The MAC's human resources, administrative job descriptions, and policies include detailed descriptions of key positions. The difference in the following is that they address safety-specific roles and responsibilities. The MAC's Human Resources department maintains a current, detailed organization chart and complete operational job descriptions. The following is a general overview of the organizational structure for safety at the MAC.



SAFETY ORGANIZATIONAL STRUCTURE

#### 4.1.1 Accountable Executive

The Chief Operating Officer (COO) is the Accountable Executive (AE) for MAC's SMS. The AE, in cooperation with the SMS Manager, is the final authority for the resolution of safety issues and acceptance of risks in the airfield operations and has specific responsibility for reviewing risks in the Very High category (see the Safety Risk Management section of this manual for more information on risk acceptance and tolerability).

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The AE sets expectations for safety performance, reinforces cultural safety norms and beliefs, and ensures that necessary resources and processes are available to implement and sustain the SMS and to support our culture with a focus on learning, accountability, and reporting as core elements of our safety commitment.

Working with the SMS Manager and other MAC leaders, the AE is responsible for the following safety-specific functions:

- leading change as safety initiatives are implemented, including providing the necessary resources,
- understanding, evaluating, and communicating acceptable levels of operational risk,
- supporting MAC's commitment to non-punitive reporting,
- ensuring safety training and equipment are available
- encouraging and participating in reporting and learning in a just culture
- supporting learning from incidents and accidents,
- including safety vision and goals in strategic decisions, and
- monitoring safety performance goals.

#### 4.1.2 SMS Manager

The SMS Manager reports to the AE and is responsible for ensuring that the safety and health management process is established, communicated, implemented, evaluated, measured, and continuously improved for our airport system and its stakeholders.

The SMS Manager provides decision support and advice to the AE and other leaders on the safety and risk implications of MAC activities. The SMS Manager also provides direct oversight and management of the MAC SMS. While the SMS Manager supports all MAC personnel, departmentlevel leadership is accountable for ensuring their teams understand and have the knowledge needed to operate safely alongside the safety team. The role of the SMS Manager is not to tell other departments *how* to do work; it is to help others make risk-informed decisions that improve the resilience, reliability, and safety of work.

To support that, the SMS Manager ensures:

- safety reporting function and review of submitted reports,
- safety risk management activities are carried out on regular operations,
- active management of the day-to-day function of the SMS
- review of the SMS manual every 12 months,
- conformity to internal and external evaluation plans,
- coordination between SMS functions and testing of the emergency response plan (ERP),
- leadership of safety meetings and committees as required for hazard review or risk assessment,
- learning from safety events and dissemination of resulting knowledge, and

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• continuous monitoring of applicable safety regulations.

#### 4.1.3 Vice Presidents and Directors

Vice presidents and Directors are responsible for the operational application of the MAC's strategic objectives and for allocation of the resources to enable meeting those objectives. They play an important role in our safety vision because of the impact they have on safety culture as a result of their application of the core tenets of our safety philosophy as they:

- guide the acceptance of risks in the High category
- guide safety management system integration into respective divisions,
- implement budgets, plan for hiring, and requisition resources,
- incorporate safety performance into departmental goals.

#### 4.1.4 Functional Managers and Supervisors

Managers and Supervisors are responsible for ensuring that MAC operations comply with all applicable safety policies and regulations and for validating and addressing safety risk management deficiencies in an appropriate and timely manner. Managers and supervisors, including trainers and inspectors, help carry out the MAC's safety vision by:

- guiding the acceptance of risks in the Moderate category
- implementing safety programs,
- ensuring staff have received safety training,
- providing safety mentoring to their teams, and
- ensuring hazards, incidents, and accidents are reported.

#### 4.1.5 All Employees

All MAC personnel are responsible for helping build a safe work environment by working to:

- identify hazards,
- report incidents, hazards, or safety suggestions,
- know emergency procedures and specific roles in the event of an emergency,
- use MAC-provided protective equipment when required,
- keep discussions of risk alive through pre- and de-briefs,
- operate by MAC SOPs and other manual systems and training, and
- collaborate with peers to build a culture that values safety and risk-informed decisionmaking

#### 4.1.6 Contractors

When contractors are used to fulfill specific operational needs, the SMS Manager is responsible for ensuring that the contracted agency has been provided with MAC's safety policies and procedures and can demonstrate performance to our safety standards. As a guide, we utilize the Vendor/Contractor Safety Performance package included in Appendix L of the SMS Manual.

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Contractors have access to the MAC safety reporting process, and we encourage the transparent sharing of ideas and the identification of safety hazards.

#### 4.1.7 Other External Roles

MAC works hard to establish and grow a strong, positive culture. Working with external service providers means we have an opportunity and obligation to ourselves and our stakeholders to ensure the MAC's philosophy of and standards for safety are clear. Through the SMS Manager, we make our initial safety training and safety performance measures available to external parties to ensure we align on safety.

#### 4.2 Managing Interfaces

At the MAC, we know that risk often exists at interfaces between systems – both internal and external. As part of understanding our broader airport system, the interface map below gives a visual summary of the interfaces within the MAC's airport operations:



#### SAMPLE INTERFACE MAP

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#### 4.3 Coordination With Internal Systems

#### 4.3.1 SMS Steering Committee

The MAC SMS Steering Committee guides the design, implementation, execution, and continual improvement of the MAC's Airport Safety Management System.

The AE chairs the SMS Steering Committee, which is comprised of key MAC stakeholders. Under 14 CFR 139 Subpart E, the SMS Accountable Executive is responsible for the safety performance of operations conducted under MSP's part 139 Airport Operating Certificate and therefore has ultimate authority over the SMS. The Airport SMS Manager facilitates the committee and is responsible for its organization and effectiveness.

#### 4.3.2 Airport Emergency Plan (AEP)

The MAC SMS interfaces with our 14 CFR Part 139.325 Airport Emergency Plan in three main ways:

- AEP exercises are opportunities to evaluate systems under stress and identify opportunities for learning from success and failure. AEP exercise outputs are integrated into the Learning Team approach to identify system improvements
- AEP planning and exercises help validate our interface mapping to ensure we understand system function and stakeholder interactions
- Frequent coordination between the SMS and AEP process owners ensures SMS continuity during degraded or irregular operational performance

The SMS Manager is responsible for coordinating with the Emergency Manager, Integrated Operations, at least annually to review SMS function and levels of authority when the AEP is activated.

#### 4.3.3 Occupational Risk and Safety

MAC employs a Manager, Occupational Health and Safety (OSH Manager) to oversee an industrial hygiene program, perform surveys, audits, analyses, and inspections; coordinate required training for MAC employees on both regulated and non-regulated health and safety issues. The MAC SMS does not replace any occupational health and safety policy, process, or procedure.

MAC also employs a Manager, Loss Prevention, to reduce employee injuries/illnesses, airport user accidents/incidents, fleet safety incidents, and other risks that impact the organization. The MAC SMS supports loss prevention policies, processes, and procedures.

The MAC Risk & Safety department creates and analyzes data that is included in regular SMS safety performance reviews. The SMS Manager interfaces with the Risk & Safety department to ensure that data from safety reports is available and that systemic issues identified through SMS functions are shared. The SMS Manager meets quarterly with Risk & Safety to formally coordinate the sharing of safety performance data.



#### *4.3.4 Enterprise Risk Management*

The MAC operates with an enterprise-level view of risk, and that view is reflected in the work of our Enterprise Risk Management team. SMS Supports Enterprise Risk Management (ERM) by providing inputs to the system that demonstrate safety risk and performance in controlling that risk. Likewise, ERM outputs describe related risk components, including financial, political, and reputational risk that may not be directly safety-related but that shape system behavior and pressures. The SMS Manager is responsible for ensuring data exchange, alignment of risk tolerability, and safety performance are formally reviewed at least annually with the MAC ERM Manager.

#### 4.3.5 MAC Health and Safety Committee

The purpose of the MAC Health and Safety Committee is to promote and create a safe work environment for all MAC employees by identifying and resolving health and safety issues. The MAC Health and Safety Committee is administered by the MAC Risk & Safety.

The SMS Manager works with the MAC Health and Safety Committee by identifying and addressing hazards in the workplace or escalating them to the appropriate personnel for mitigation. The Health and Safety Committee is also used as a conduit to promote the SMS and share critical safety information with MAC divisions.

#### 4.4 Coordination With External Stakeholders

#### 4.4.1 MSP Airport Safety Committee

The SMS Manager coordinates with external stakeholders via the MSP Airport Safety Committee. The Airport Safety Committee's function is to promote, support, and continually improve the Minneapolis-St. Paul International Airport's overall safety position through the collaboration and execution of the numerous SMSs and Safety Programs at the airport.

The overall goal is to create a safe operational environment for all airport users and employees by identifying hazards and mitigating the associated risk on and around the airport.

#### 4.4.2 Data Sharing, Industry Collaboration, and Industry Safety Groups

The SMS Manager directs participation with other industry organizations that include:

- Industry safety related workgroups and task forces including (but not limited to):
  - Core 30 Airport SMS Task Force
  - Airport SMS Support Group (Core 30 SMS Anchor Airport Initiative)
  - Joint ACI-NA/AAAE Airport SMS Task Force
  - AAAE Operations and Safety Work Group
- Air Traffic Organization (ATO) led safety meetings including (but not limited to):
  - MSP Airport Runway Safety Action Team (RSAT)
  - MSP Airport Customer Forum
  - MSP Air Traffic Safety Risk Management Panels (SRMPs)

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- Communication and collaboration with outside parties regarding airport safety matters.
  - $\circ$   $\;$  Air carriers and airport tenants
  - Other part 139 regulated airports

#### 4.5 Safety Objectives

The MAC's safety objectives are designed in cooperation with operational leaders and are formally reviewed at least annually by the Accountable Executive with support from the SMS Manager. We support our objectives with Safety Performance Targets that help us track our performance toward larger safety goals. Current MAC safety objectives are available in Appendix A, MyMSPConnect and on MACPoint. MAC's safety objectives tie into our purpose, and we believe that operating safely supports our purpose, values, and commitment to:

- Take ownership.
- Act with integrity.
- Treat each other well.
- Commit to continuous improvement.

#### 4.6 Safety Performance Measures

At the MAC, we believe safety is more than simply avoiding negative outcomes. Our focus is on building resilient teams and systems that enable good, safe work while also striving to prevent accidents and injuries. We measure and evaluate our safety performance with those measures in mind.

We use a three-component format for safety performance objectives:

- First, we look to answer a Safety Performance Question (SPQ) that ties to our operations by seeking to understand high-consequence threats to our safety. Examples of SPQs are: *How is our reporting system performing*? or *How effective are our runway incursion prevention efforts*?
- We answer SPQs in part by examining Safety Performance Indicators (SPIs). Continuing the previous example, an SPI might be the *rate of safety report submission* by operating group or the performance of crews on *driving scenarios during scheduled training and evaluation operations*.
- Finally, we set Safety Performance Targets (SPTs) that place SPIs in context. As an example, we may strive to achieve a reporting rate of *10 safety reports per 1000 hours* (or some other normalized rate) worked across the organization, or we may look toward incremental improvement of simulated landing issues based on training changes. To reach this objective, our teams select operational goals to support safety performance objectives.

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We think about our goals and objectives using the SMART methodology for performance objective development:

Specific	Each target should be focused on one thing only.
Measurable	We should be able to measure whether or not we hit the target.
Achievable	The target should be within our capabilities.
Relevant	The target should be something of importance to safety.
Time-Bound	There should be a deadline for achieving the target.

Because objectives shift as we grow and as operations change, we don't list them as a policy in this manual. We review, with leadership from the SMS Manager, safety performance measures at least every 12 months and publish them in Appendix A of this manual.

#### 4.7 Safety Documentation

During our operations, our SMS generates documentation in the form of:

- safety training records,
- safety risk assessments,
- our risk register,
- internal and external evaluation records,
- safety reports,
- remedial action plans,
- investigation and learning team records, and
- AEP exercise after-action reports

The SMS Manager is the custodian of these records, and the MAC's forms – where appropriate – are included in the Appendices section of this manual and are available on MACPoint.

Safety records are maintained for at least three years, or in the case of SRM records, for as long as the hazard and control are relevant to operations or the mitigation is in place.

All records, except for safety reports, may be made available at the request of and by approval of the SMS Manager. To protect the integrity of the MAC's safety reporting system, reports are confidential, and access is restricted to the SMS Manager. De-identified data may be provided by the SMS Manager as needed for investigations, regulatory compliance, or to address concerns raised in a report.

The SMS Manager is responsible for facilitating an annual review of records and for ensuring that obsolete documents or records are removed from all potential points of use and destroyed as outlined by our information technology and data management policies.

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#### 4.8 Confidential Safety Reporting

At the MAC, we use the term Safety Reports to describe hazard reports, incident reports, event reports, etc. Here at the MAC, we take a holistic view of safety and resilience, and we believe our reporting system should support that view by including positive events and suggestions as well as events and areas for improvement of our SMS.

#### 4.8.1 How to Report

Our physical Safety Report, email addresses, and phone numbers are attached to this manual as Appendix C. The form – reproduced with some interface changes in electronic format – is available via links located on the MAC's online SMS hub (MyMSPConnect) and the MACPoint. While we're always happy to hear about opportunities for improvement or recognition in any format, the form provides structure to our learning process as an organization and enables more consistent responses and feedback.

Reports can be submitted (see Appendix C for detailed information):

- Electronically (using the QR code below) or at the MAC SMS Hub
- By email
- in hardcopy form
- by phone, or
- in person as a verbal report



MAC SAFETY REPORTING SYSTEM QR CODE

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#### 4.8.2 Confidential and Anonymous

All safety reports at the MAC are confidential. That means that once submitted, your information is protected by the SMS Manager and will be de-identified. You will likely receive confirmation from the SMS Manager, but no identifiable information is shared outside of our safety system. Only general information will be used to mitigate hazards and communicate system improvements.

In addition to the confidentiality aspect of our safety reporting system, any MAC Safety Report can be submitted anonymously via our electronic form.

To learn and improve as an organization, we are also open to hearing feedback and ideas on how to improve our safety systems from employees. We ask that you consider including contact information to your report so that we can provide feedback and further discuss your thoughts and ideas on how to improve safety and our systems.

#### 4.8.3 Non-Punitive Reporting System

Participating in the MAC's safety reporting system is free from reprisal; information submitted to the system will not be used to punish or otherwise take administrative action against anyone.

The MAC's safety reporting system protections do have limits however:

- Participation in the system does not protect individuals from enforcement or administrative action when an event or violation is otherwise known *outside* of the safety reporting system.
- If you are willfully operating outside of the law, MAC ordinance, policy, or purposefully placing anyone in danger, you may still be subject to enforcement or administrative action.

#### 4.8.4 Professional Accountability and Just Culture

MAC believes in building a culture of professional accountability by practicing a Just Culture approach to learning. Basic guidance on our Just Culture approach – a culture that values learning and shared accountability – is provided in Appendix I of this manual. While the flow chart in Appendix I is a useful decision tool, it is not policy and may be adjusted and applied according to context.

#### 4.8.5 Report Management and Feedback

The SMS Manager oversees the handling all Safety Reports. Even if third-party software is used to help analyze and extract intelligence from reports, all data remains confidential, de-identified, and protected.

When a report is submitted, it will be processed within 72 hours. That means if you include your name on a report, you'll hear back within 72 hours acknowledging receipt of your submission.



Review, recommendations, and resolution from safety reports may take significantly more time. You can be as involved as you like in the resolution process for the report.

The SMS Manager will:

- review the report and acknowledge receipt (except for anonymous reports)
- notify department manager(s) of any immediate safety issues
- track and de-identify the report for data entry
- assess risk and investigate as required
- add supplemental information to the report to facilitate analysis
- develop corrective action in coordination with representatives from the MSP Airport or MAC Safety Committee or department managers
- assign corrective actions and timeframes as required
- review effectiveness
- communicate outcomes.

#### 4.9 Compliance Monitoring

#### *4.9.1 Regulatory Compliance*

Operational divisions and workgroups are expected to monitor and implement regulatory changes that affect their operations. The SMS Manager coordinates with departmental representatives to conduct regular assessments – at least annually – to monitor the safety impact of changes in the regulatory landscape affecting the MAC operations.

The SMS Manager also works with stakeholders, which include first responders, customers, industry groups, and contractors, to ensure their expectations and regulatory requirements are reviewed at least annually in conjunction with the SMS review cycle.

#### *4.9.2 Performance Standards*

The SMS Manager is also responsible for monitoring FAA and ICAO standards for updates, which is completed by enrolling sms@mspmac.org in the FAA and ICAO email distribution lists and participating in regularly scheduled industry learning events.





## 5 SAFETY RISK MANAGEMENT

Safety Risk Management (SRM) is a core element of the MAC SMS. It is the process by which we evaluate our systems for hazards, assess their impact, and treat risk to a level acceptable to the MAC. The primary output of the SRM process is risk intelligence, which enables informed decision-making.

The formal process for SRM is not intended to replace professional judgment or interfere with any employee taking reasonable steps to stop work where environmental, health, or safety risk is identified and calls for immediate action.

At the MAC, the SRM process follows FAA and ICAO recommendations, and the process looks like this:



**SRM PROCESS** 

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#### 5.1 When We Conduct SRM

We follow the general guidelines below to identify opportunities to use our SRM processes, and more detailed guidance is included in Appendix D and in our SMS training catalog. There are formal elements to SRM, but that doesn't mean that every opportunity for risk management requires using a panel discussion or a matrix to make a decision.

Here are a few triggers that prompt us to use the formal SRM process outlined in this section and Appendix D:

- A new scope of operations or substantial change to our existing scope (see Section 4.4 for more detailed information about change management). Things like a new airline partner, changes to taxiway traffic, an updated snow and ice control plan, or terminal construction might fall into this category of *proactive SRM*.
- A serious incident or accident, like a runway incursion, collision, or serious vehicle accident, should prompt the *reactive* or retrospective use of SRM as a learning tool.
- When our Safety Assurance process shows us that controls are ineffective or we haven't fully understood new or existing hazards or systems.

At an operational level, the five steps of SRM in this section of the SMS Manual are still important, but may not require a formal process beyond a discussion within a workgroup. What is important is that ways of treating risk be shared, which allows other shifts, operational areas, or stakeholders to benefit from proactive risk thinking. The MAC Safety Reporting System is the best way to share the outcomes of front-line risk management.

#### 5.2 Hazard Identification

#### A HAZARD IS A CONDITION THAT MIGHT CAUSE INJURY, DAMAGE, OR INTERRUPTION TO OUR OPERATIONS.

At the MAC, we are most interested in proactive hazard analysis, though we learn from reactive methods as well. This means we work to identify lower-consequence events like near-misses or process issues to improve system and team performance. Some sources of hazard identification information we use include safety reporting systems, inspections, evaluations, brainstorming sessions, coordination with airport stakeholders, maintenance data analysis, and expert judgment.

New or changing hazards trigger the SRM process. Sometimes, hazards and risk are evaluated as a reaction to an event, but the process is also intended for proactive use before we undertake a hazardous operation or a substantial change to work or the MAC organization.

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We also learn about hazards from outside industry data, event investigations, and Learning Teams. The SMS Manager directs the hazard identification process with cooperation from front-line employees and supervisors, who often understand hazards best.

One less obvious type of hazard we focus on is an error trap. Error traps are situations where conflicting goals require people to choose between actions that each might be considered wrong. In some cases, completing work might require an unacceptable tradeoff we may not see without looking for hazards proactively. Additional information about hazard types and examples is in Appendix D.

Hazards differ from outcomes; hazards are the source of some unintended *consequence*, but not the consequence itself.

#### 5.3 Risk Assessment

#### RISK TAKES THE CONCEPT OF A HAZARD AND PLACES IT INTO OUR OPERATIONAL CONTEXT BY EVALUATING THE SEVERITY AND PROBABILITY THAT WE ARE AFFECTED BY A POTENTIAL CONSEQUENCE OF A HAZARD.

Risk is relative, so we value a variety of opinions for a better view of our organizational risk. That's part of why our MSP Airport Safety Committee and MAC Health and Safety Committee have representatives from each of their relevant departments.

When we evaluate hazard consequences and assign a risk priority, we look at the worst credible outcome, not the worst possible outcome. When it makes sense, we evaluate a spectrum of outcomes to gain as realistic a view as possible.

We also evaluate several types of risk. In addition to safety-related risk, risk may be reputational, financial, political, or environmental (among others). Our SMS helps us identify interfaces with other systems to understand how safety risk contributes to our overall organizational risk.

Often, risk and a sense of uncertainty live together. Although they are not the same thing, a feeling of uncertainty may be a sign that there is a risk we should work to understand, consider and possibly mitigate before we continue work.

We evaluate risk as a combination of potential severity and likelihood of the outcome. The MAC uses a **risk matrix** to help structure our conversations about risk. Most importantly, risk is evaluated holistically and with a focus on learning from those doing the work.

Risk is assessed before, and then in consideration of, treatment of the risk. We use the combination of identified hazards and risks to create the MAC's risk profile, which is included in Appendix E of this manual. The SMS Manager ensures an annual review of the risk profile, considering operational changes and new or changing hazards.

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#### 5.3.1 Risk Assessment and Acceptance

Formal risk assessment is typically conducted at the operational level, supported by the SMS processes, the SMS Manager, and involvement from personnel affected by the risk.

Where formal, proactive risk management is conducted, final risk acceptance must be completed by a MAC manager (or higher, as specified in this manual) who has completed the appropriate MAC SMS training. Personnel accepting risk on behalf of the operation may only do so in areas within their authority.

#### 5.3.2 Risk Control

Risk, once we've classified and assessed them, can be:

- accepted, but only at the acceptance levels in a few paragraphs
- transferred by using a contractor or insurance
- mitigated by reducing the severity or likelihood
- avoided altogether

More information on types of risk controls and methods for applying controls are located in Appendix D.

MAC ALWAYS WORKS TO CONTROL RISK TO A LEVEL AS LOW AS REASONABLY PRACTICABLE (ALARP).

#### 5.3.3 Risk Register

Once hazards are identified and consequences evaluated in terms of risk, the information is recorded in the MAC Risk Register (Appendix F of this manual and available on MACPoint), overseen by the SMS Manager. The SMS Manager ensures the risk register is evaluated annually with input from the MAC Health and Safety Committee for changes to severity, probability, or risk treatment effectiveness.

#### 5.3.4 Types of Risk

Within the framework of our SMS, we focus on safety risk, but we also consider other types of risk (see Appendix D for more detail) as we look to understand the impact within our airport system:



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Reputational	The potential for damage to an organization's brand, credibility, or public perception due to negative publicity, ethical lapses, or customer dissatisfaction. This can lead to loss of trust, reduced customer loyalty, and declining business performance.
Financial	The possibility of financial loss due to factors such as market fluctuations, credit defaults, investment failures, or liquidity issues. Poor financial management or unexpected economic downturns can jeopardize an organization's stability and growth.
O perational	Risks arising from internal failures in processes, systems, or human performance that can disrupt business functions. These risks may include supply chain disruptions, IT failures, or procedural inefficiencies that impact productivity and service delivery.
Physical	The threat of harm to people, property, or infrastructure due to natural disasters, accidents, or security breaches. These risks can lead to financial loss, operational downtime, and legal liabilities.
Regulatory	The risk of non-compliance with laws, industry standards, or government regulations that could result in fines, legal action, or business restrictions. Changing regulatory landscapes require constant monitoring to ensure adherence and mitigate penalties.
Organizational	Internal risks related to leadership, culture, structure, or workforce dynamics that may impact business effectiveness. Poor decision-making, talent shortages, or misalignment with strategic goals can weaken an organization's overall performance.

#### 5.3.5 Risk Matrix

The matrix we use at the MAC is designed to reflect that risk does not follow a linear path. It increases exponentially, and most of our decision-making is between high and low risk.

The dark line between the yellow and orange blocks represents the general region of the MAC's risk appetite, that is, the highest risks we accept in the course of doing the business of airport operations. Safety risk is fluid, though; a matrix only considers the potential severity and likelihood at a single point in time.

This matrix is a tool for ensuring common language when we consider risks, but it cannot replace risk-informed decision-making that involves those directly affected by the risk. As risk increases, higher levels of authority must be involved in accepting, mitigating, avoiding, or transferring that risk.

Our goal is to identify critical risks and error traps so that we can implement controls around those things that are likely to result in serious injury, fatality, or operational interruption.

The MAC risk matrix is a tool for communication and prioritization, and it serves as a point of reference across various departments, operations, and stakeholders. Using the matrix to evaluate risk is not the same as risk control.

Instructions and examples of how to use the MAC risk matrix are in Appendix D.









Risk Assessment Scale - Liklihood of Impact			
Qualitative Quantitative Values Values			Description
5-Very High	96-100	10	Error, accident, or act of nature is almost certain to occur; or occurs more than 100 times a year
4-High	80-95	8	Error, accident, or act of nature is highly likely to occur; or occurs between 10-100 times a year.
3-Moderate	21-79	5	Error, accident, or act of nature is somewhat likely to occur; or occurs between 1-10 times a year.
2-Low	5-20	2	Error, accident, or act of nature is unlikely to occur; or occurs less than once a year, but more than once every 10 years.
1-Very Low	0-4	0	Error, accident, or act of nature is highly unlikely to occur; or occurs less than once every 10 years.

Risk Assessment Scale - Severity of Impact				
Q ualitative Values	Q uanti Valu		Description	
E-Very High	96-100	10	The event could be expected to have multiple severe or catastrophic adverse effects on organizational operations, organizational assets, individuals, or other organizations.	
D-High	80-95	8	The event could be expected to have a severe or catastrophic adverse effect on organizational operations, organizational assets, individuals, or other organizations. A severe or catastrophic adverse effect means that, for example, the event might (i) cause severe degradation in or loss of capability to an extent and duration that the organization is not able to perform one or more of its primary functions; (ii) result in significant damage to organizational assets; (iii) result in major financial loss; or (iv) result in severe or catastrophic harm to individuals involving loss of life or serious life-threatening injuries.	
C-Moderate	21-79	5	The event could be expected to have a serious adverse effect on organizational operations, organizational assets, individuals, or other organizations. A serious adverse effect means that, for example, the threat event might: (i) cause a significant degradation in capability to an extent and duration that the organization is able to perform its primary functions, but the effectiveness of the functions is significantly reduced; (ii) result in significant damage to organizational assets; (iii) result in significant financial loss; or (iv) result in significant harm to individuals that does not involve loss of life or serious life-threatening injuries.	
B-Low	5-20	2	The event could be expected to have a limited adverse effect on organizational operations, organizational assets, individuals, or other organizations. A limited adverse effect means that, for example, the threat event might (i) cause a degradation in operational capability to an extent and duration that the organization is able to perform its primary functions, but the effectiveness of the functions is noticeably reduced; (ii) result in minor damage to organizational assets; (iii) result in minor financial loss; or (iv) result in minor harm to individuals.	
A-Very Low	0-4	0	The threat event could be expected to have a negligible adverse effect on organizational operations, organizational assets, individuals, or other organizations.	

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#### 5.3.6 Risk Tolerability

Very High	Only acceptable by the Accountable Executive with involvement from those exposed to the risk	
High	Directors or higher must be involved in risk and control discussions	
Moderate	Operational managers must be involved in a discussion of risk and controls, and above this level, the Safety Performance Group must be informed	
Low	Low Generally acceptable at the point of work after discussion with the operational team responsible for the risk	
Very Low	Generally acceptable at the point of work, so long as the person accepting the risk is involved in the exposure	

No matter what level we assess risk at, we will work to reduce risk to a level that is as low as is reasonably practicable – ALARP. That means that even when risk is low, we take practicable opportunities to lower it even further.

**VERY LOW** risk category (green) indicates that the risk of an event is generally acceptable or that it is sufficiently controlled. No action is usually taken with this, though if a simple solution would lower risk further, we may choose to implement it. **Employees at the point of work can generally accept this level of risk**.

**LOW** risk category (light green) indicates that the risk of an event is generally acceptable, or that it is sufficiently controlled. Stakeholders may consider risk reduction measures during periods of future system change. **Operational teams can generally accept this level of risk after review or pre-planning**.

**MODERATE** risk category (yellow) is an area of risk that is generally acceptable but needs to be monitored to ensure controls are effective in reducing risk as low as reasonably practicable. If effective controls are in place and we maintain risk at this level, we may choose to accept it. **Supervisors and managers, with input from the teams affected by the risk, can generally accept risks in this category**.

**HIGH** risk category (orange) is an area of elevated risk that requires closer evaluation. Additional controls should be considered prior to implementation. If the risk is not able to be practicably reduced by controls, careful consideration and involvement of **directors (or higher authority as appropriate)**, with input from people impacted by the risk, is required to accept risks in this category.

**VERY HIGH** risk category (red) indicates an area needs more effective control measures to bring the probability or severity down. If controls are not available and the operation is required, **only the SMS Accountable Executive, in collaboration with the SMS Manager and the people involved in the work, can accept risks in this category.** 

In all cases where formal safety risk management activity is conducted, final risk acceptance must be completed by the MAC manager (or higher, as indicated above) responsible for overseeing the work, with involvement by those affected by the risk.



**RISK TOLERABILITY PROCESS** 



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#### 5.4 Managing Change

Change can introduce new hazards, impact the appropriateness of existing safety risk mitigation strategies and/or impact the effectiveness of existing safety risk mitigation strategies.

Managing safety effectively means that we systematically and proactively identify hazards that are a by-product of change and we develop strategies to manage the associated safety risks.

#### 5.4.1 Change Management Scope

The MAC will review the following to proactively understand and plan measures to reduce risk to ALARP, where appropriate, using the risk assessment procedures contained in this manual:

- new system designs,
- changes to existing system designs.
- new operations/procedures, and
- modified operations/procedures.

#### 5.4.2 Change Management Process

As we design, implement, or respond to change, Appendix G outlines the process we use to evaluate shifting risk that may happen because of:

- System criticality
- System stability
- Human limitations
- Technological limitations
- Changes to the physical environment
- Regulatory change
- Performance monitoring capability during periods of change

Appendix G includes an outline of the process we use to initiate and manage change, along with resources that help assess the risk of change throughout a project.





## 6 SAFETY ASSURANCE

The MAC's Safety Assurance (SA) consists of processes and activities to determine whether the SMS operates according to expectations and requirements. The SA process verifies and validates the effectiveness of risk controls by using SPIs and SPTs, and by continuously monitoring its processes and the MAC's operating environment to identify changes or deviations that may introduce safety risks or the degradation of existing safety risk controls.

The general process for Safety Assurance is:



**THE SA PROCESS** 

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#### 6.1 Internal Evaluation Program

The MAC utilizes an Internal Evaluation Program (IEP) to evaluate the SMS-specific and other safety processes of the organization to ensure compliance with regulatory requirements, identify nonconformance to internal safety policies and procedures, and identify opportunities to improve organizational safety policies, procedures, and processes. Most importantly, though, we use our IEP to identify areas where we build capacity and resilience to learn from and replicate effective performance.

The SMS Manager manages the MAC's Internal Evaluation Program on a progressive cycle as specified in Appendix H. The MAC's SMS IEP philosophy differs from a traditional audit because it focuses on performance, not just compliance with the regulatory standard. All SMS IEP entries require evidence to support conformity.

The SMS Manager verifies that evaluators are appropriately trained and supported, and that training records are maintained. The primary output of the IEP is an assessment of effectiveness. IEP details are included in Appendix H of this manual.

#### 6.2 External Evaluations

External evaluations of the SMS may be conducted by our regulator (the FAA or other agencies with regulatory jurisdiction) or other third parties selected by the MAC (including audit organizations, other airports, ICAO, IATA, or others). The results of these evaluations are used to validate internal assurance functions and are included in the safety assurance and, as appropriate, safety risk management functions of the SMS.

#### 6.3 Safety Surveys

As a component of the Safety Assurance function, the MAC surveys all personnel on safety climate and awareness at least biennially. The results are used to understand the organization's safety culture, and they are collected and analyzed by the SMS Manager for review by leadership and management teams and as a tool for prioritizing Safety Promotion initiatives.

#### 6.4 Event Investigations and Operational Learning

The MAC learns from investigating abnormal events as well as understanding normal operational performance. We recognize that we learn best when we combine our knowledge of what goes wrong with our knowledge of how teams create successful outcomes every day. Investigating failures helps us learn about error propagation and system failures, while searching for enablers of success helps us identify and create more success in our operations.



The SMS Manager acts as the investigation lead, utilizing subject matter experts and other resources where appropriate. The SMS Manager may also designate other personnel to act as the investigation lead, when appropriate.

To enable consistent and appreciative investigations, we employ standardized methodological processes and tools. Our standard investigation tool is a Learning Team. Learning Teams focus on understanding system function from the perspective of those involved in an event, and they do not emphasize blame or a single root cause. Appendix M contains worksheet materials for facilitating a Learning Team.

We support our investigative process outcomes with a Just Culture approach, as detailed in Appendix I of this manual. The Just Culture concept permeates the MAC's approach to safety at work by acknowledging that context and intent are as important as outcomes to understanding how our systems perform.

#### 6.5 Continuous Improvement

Internal and external evaluations, in combination with event investigation, surveys, and ongoing performance monitoring against established and validated SPIs and SPTs, provide the framework by which we make data-informed decisions about safety and risk.

On an annual basis, the SMS Manager facilitates an SMS performance review with the MAC's top management – including the SMS Accountable Executive – using the template in Appendix J.





## 7 SAFETY PROMOTION

Safety promotion helps the MAC build and sustain a strong, positive safety culture and helps us to achieve our safety objectives through a combination of technical competence, education and training, effective communications and information sharing, and ensuring safety management promotes safety culture throughout the organization.

#### 7.1 Safety Learning

Appendix K of this manual provides an SMS training matrix for defined MAC roles and for stakeholders who have access to MAC training. The matrix includes applicable subject areas as well as the frequency of training. The SMS Manager is accountable for delivering and confirming safety training delivery and completion, and managers and supervisors are responsible for ensuring training is completed.

In addition to training for specific job functions, MAC employees are provided general safety training and SMS training matched to their responsibility and involvement in the MAC SMS. We rely on a combination of instructional delivery methods to deliver information, including classroom and computer-based training. All MSP Airport badge holders authorized to access the MSP AOA are also provided with a general safety awareness orientation.

All safety training development or improvement includes:

- A training needs analysis
- Developing learning objectives
- Identifying how we will evaluate learning outcomes

Safety training courses are reviewed at least every 24 months by the SMS Manager and updated as necessary to ensure they remain relevant. Part of this review includes an assessment of training effectiveness as outlined in Appendix K to ensure that our training achieves planned efficacy and outcomes.

All SMS training and completion results are documented and maintained in the employee's SMS training file.

In addition to training for MAC operational personnel, the SMS Manager engages in professional safety development through trade groups, seminars, conferences, or other courses on an annual and recurring basis as a tool for continuous improvement.



#### 7.2 Communication

Effectively communicating safety information to the MAC and greater airport community is integral to the effective functioning of our Safety Management System. We rely on multiple communication methods to:

- Ensure that all MAC personnel and badge holders are aware of the SMS and its functions
- Convey safety lessons/information/learning
- Explain why certain organizational actions are taken
- Explain why safety procedures are introduced or changed
- Communicate SMS activity updates
- Promote the MAC's safety objectives (SPIs and SPTs), goals, and culture

Communications are tailored to each employee group to permit the safety team and line management to adapt safety communications to meet the needs of operational groups.

Line managers involve the SMS Manager in department-specific safety communications to ensure awareness, avoid duplication of efforts, and prevent conflicting information. Evaluation of communication effectiveness is completed as part of the IEP cycle.

Appendix N includes tools for designing safety communications and evaluating communication effectiveness throughout MAC and its stakeholder relationships.





## i. SUPPORTING APPENDICES

This SMS Manual is supported by a catalog of appendices that provide more detail on how we accomplish the processes that make up our SMS. Each appendix includes guidance as well as procedures for ensuring we manage safety systematically. SMS Appendices are managed by the SMS Manager and are reviewed concurrently with this manual.

ii. SMS Appendix List

Glossary	Definitions and Acronyms
Appendix A	Safety Performance Objectives and Measures
Appendix B	[open]
Appendix C	Safety Reporting System and Reporting Guide
Appendix D	Safety Risk Management Guide
Appendix E	MSP Airport Safety Risk Profile
Appendix F	MSP Airport Safety Risk Register
Appendix G	Change Management Guide
Appendix H	Internal Evaluation Program
Appendix I	Just Culture Decision Support Tools
Appendix J	SMS Performance Review
Appendix K	Safety Training Catalog and Training Matrix
Appendix L	MAC Vendor/Contractor Safety Performance Evaluation
Appendix M	Event Learning (Learning Teams) Facilitation
Appendix N	Safety Communication Guide



