PHL | SMS SAFETY MANAGEMENT SYSTEM

QUICK REFERENCE GUIDE

Safety Risk Management (SRM)

PHL | SMS
SAFETY MANAGEMENT SYSTEM

TABLE OF CONTENTS

At PHL, Safety Risk Management (SRM) is considered one of the core SMS functions to support risk based decision making at all levels of the Airport community. Understanding SRM and the standard process for assessing hazards and risks is critical to the success of the SMS. This guide provides an overview of terms, processes, and tools to support the PHL SRM and SMS.

SMS at PHL

SMS is an integrated collection of practices, procedures, and programs ensuring a formal approach to system safety through risk management. SMS makes certain all changes are documented and problems and issues are tracked to conclusion.

SMS consists of four components:

- **Safety Policy and Objectives** include establishing and managing safety policies and identifying goals and objectives to measure the performance of the SMS. SMS requires management commitment from the highest levels of the organization.

- **Safety Risk Management** is founded on performing risk assessments to identify hazards proactively, assessing risks, and developing controls to reduce hazards to acceptable levels.

- **Safety Promotion** includes employee training to identify and report hazards as well as promotional efforts to encourage a positive safety culture and communicate safety information.

- **Safety Assurance** measures the effectiveness of the airport's SMS through assessments and audits, allowing for continuous improvement.

Safety Policy

- Policy Statement
- Objectives and Metrics
- Roles and Responsibilities
- Organizational Reporting

Safety Risk

- Hazard Identification
- Safety Assessment Triggers
- Risk Analysis/Assessment
- Safety Control Development

Safety Assurance

- Continuous Improvement
- Performance Monitoring
- Audits and Assessments
- Safety Control Monitoring
- Data Collection and Reporting Systems

Safety Promotion

- Training and Orientation
- Communication
- Safety Culture
- Media and Branding

SRM Process

At the core of SMS is the Safety Risk Management (SRM) component. SRM is structured to help everyone consistently identify, analyze, and quantify existing or potential new hazards at the Airport.

Through the standardized SRM process PHL collects hazard and risk information and prioritizes and responds first to the most urgent (high risk) concerns.

Ideally, hazards are managed proactively to avoid negative outcomes; but at times response is needed immediately to resolve emergencies.
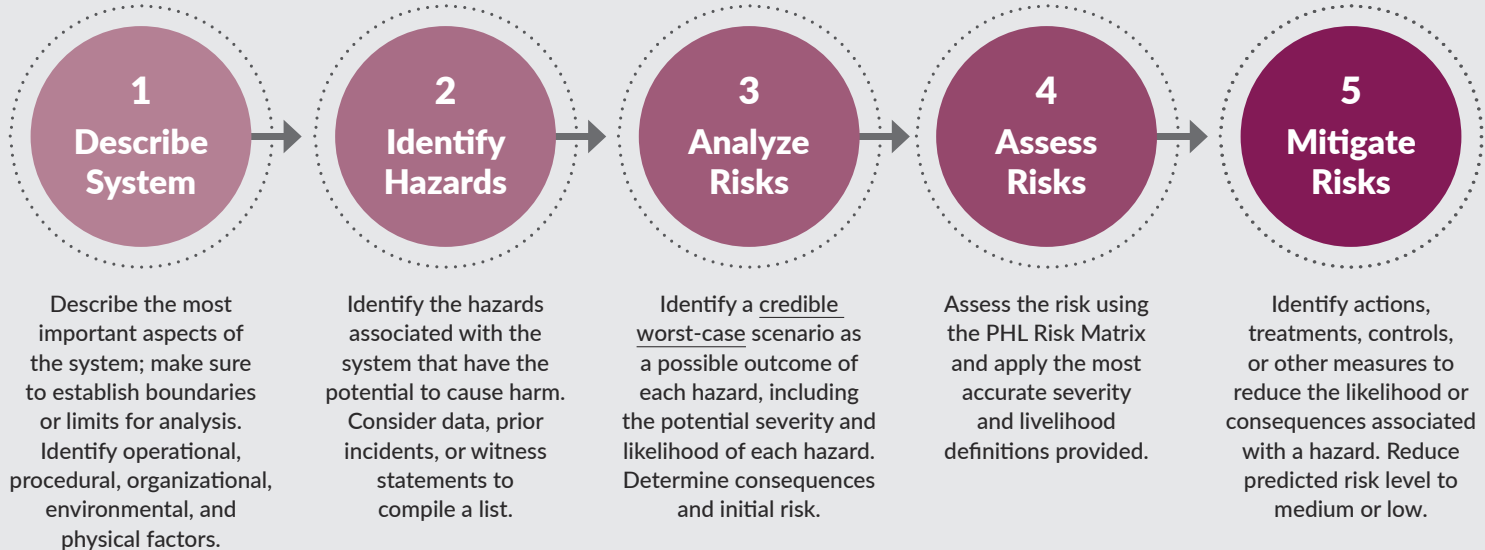
A list of hazards (a risk register) is compiled and organized for PHL management to review both proactive and reactive responses to hazards. The information is used to monitor response effectiveness and improve safety through continuous learning.

This image demonstrates that first PHL reviews and assesses identified hazards and then mitigates the hazard by applying additional controls or treatments to reduce the possibility a negative outcome will occur.

RISK MANAGEMENT

ASSESS
IDENTIFY
ANALYZE
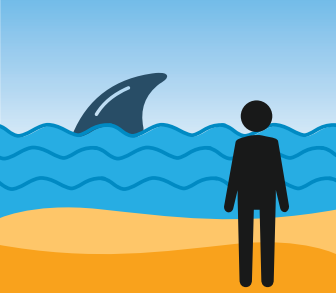REVIEW
MITIGATE
CONTROL
TRANSFER
REDUCE
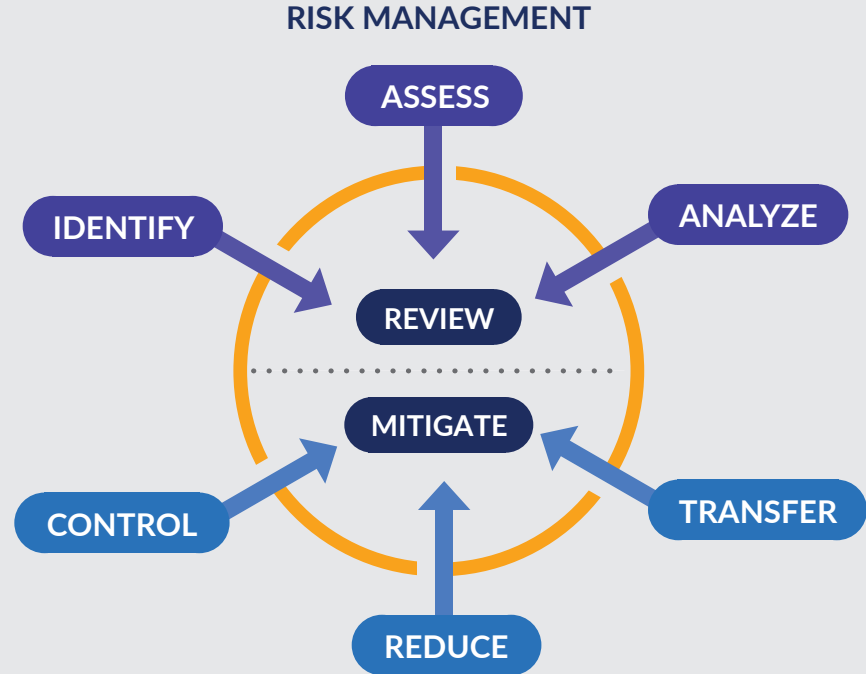
SRM 5-STEP PROCESS

The standard 5-step process to manage safety risk can be as complex as an entire airside construction project with multiple hazards or as focused as deciding if pavement deterioration requires patching. Each step must be completed to ensure the process results are accurate. Often, subject matters experts, experience, and prior events can help guide identifying hazards and the potential worst case outcome. Keep in mind consequences need to be credible! The 5 steps can be accomplished with a few people or by gathering multiple stakeholders to ensure all points of view are taken into consideration.

1 — Describe System
2 — Identify Hazards
3 — Analyze Risks
4 — Assess Risks
5 — Mitigate Risks

1 — Describe System
Describe the most important aspects of the system; make sure to establish boundaries or limits for analysis. Identify operational, procedural, organizational, environmental, and physical factors.

2 — Identify Hazards
Identify the hazards associated with the system that have the potential to cause harm. Consider data, prior incidents, or witness statements to compile a list.

3 — Analyze Risks
Identify a credible worst-case scenario as a possible outcome of each hazard, including the potential severity and likelihood of each hazard. Determine consequences and initial risk.

4 — Assess Risks
Assess the risk using the PHL Risk Matrix and apply the most accurate severity and livelihood definitions provided.

5 — Mitigate Risks
Identify actions, treatments, controls, or other measures to reduce the likelihood or consequences associated with a hazard. Reduce predicted risk level to medium or low.

WHAT IS A HAZARD

A **hazard** is anything with the potential to cause injury, damage, or disruption of normal operations.

Hazard vs. Risk

Hazard — A Hazard is something that has the potential to harm you

Risk — Risk is the likelihood of a hazard causing harm

A shark in the sea is a hazard

Swimming with a shark is a risk

TYPES OF HAZARDS

Day-to-Day Hazards
Hazards that are associated with daily activities and can be resolved immediately.

Operational Hazards
Hazards that are part of airport operations but require additional review and analysis or temporary/interim mitigations.

Project Hazards
Hazards associated with a specific project, which is defined as a temporary condition that has a beginning and end; projects can include construction, operational changes, major maintenance, or efforts associated with a new tenant, etc.

Consider these Questions:
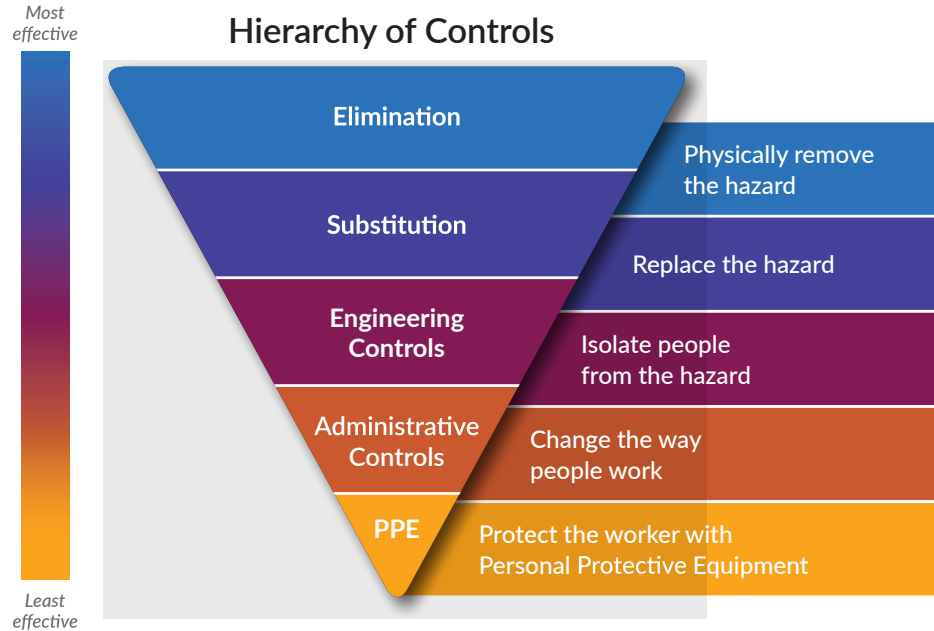
Is the risk above an acceptable level?
_____

What can be done to reduce or eliminate risks?
_____

What is the appropriate balance between benefits, risks, and resources?
_____

Are new risks introduced as a result of the identified risks being controlled?

Hierarchy of Controls

Most effective

Least effective

Level	Description
Elimination	Physically remove the hazard
Substitution	Replace the hazard
Engineering Controls	Isolate people from the hazard
Administrative Controls	Change the way people work
PPE	Protect the worker with Personal Protective Equipment

What does Risk Control mean?

Risk control is a step in the hazard management process. It involves finding a way to neutralize or reduce an identified risk. In many cases, a controlled risk is still a potential threat to the Airport community, but the dangers associated with it have been significantly reduced. Some controls are more effective than others starting with elimination.
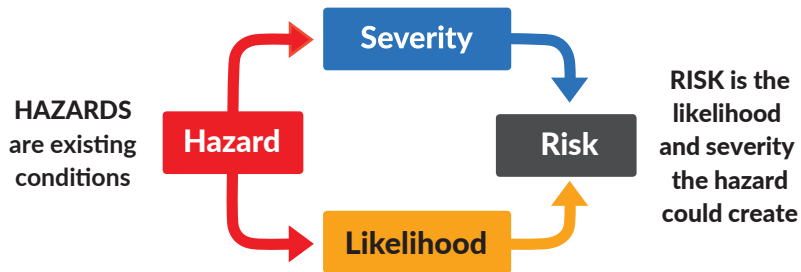
WHAT IS A RISK

On the following page is PHL's risk matrix; it represents and defines both severity and likelihood for safety decision making.

To use a risk matrix, we first consider a hazard's potential negative outcome, a bird ingestion into an aircraft engine for example. Then, the worst credible outcome and chance of occurrence are used to plot a risk factor by assessing severity first then likelihood.

For many risks that fall on the matrix's green area, front line personnel will make operational decisions to address and manage the safety concerns. Information from a risk assessment will help PHL manage and prioritize risk and safety.

HAZARDS are existing conditions

Hazard → Severity

Hazard → Likelihood

Severity + Likelihood → **Risk**

RISK is the likelihood and severity the hazard could create

Risk Assessment Questions to Consider

LIKELIHOOD

a) Is there a history of similar occurrences or is this an isolated event?

b) What other equipment or components of the same type might have similar defects?

c) How many personnel are following, or are subject to, the procedures in question?

d) What percentage of the time is the suspect equipment or the questionable procedure in use?

e) To what extent are there organizational, managerial or regulatory implications that might reflect higher threats to public safety?

SEVERITY

a) How many injuries could occur or lives lost?

b) What is the environmental impact?

c) What is the impact of the property or financial damage?

d) What operational closures or constraints could occur?

e) What are the likely political implications and/or media interest?

PHL RISK MATRIX

SEVERITY / LIKELIHOOD	Negligible (5) No damage to aircraft, or minimal injury, or discomfort of little consequence	Minor (4) Minimal damage to aircraft, or minor injury, or minimal unplanned airport operations limitations	Major (3) Major damage to aircraft, and/or minor injury, or major disruption to airport operations, or serious incident	Hazardous (2) Severe damage to aircraft, and/or serious injury, or major unplanned operations limitations	Catastrophic (1) Complete loss of aircraft, or fatal injury, or complete unplanned airport closure and destruction of critical facilities
Frequent (A) Expected to occur more than once per week or every 8,000 operations	🟩	🟨	🟧	🟥	🟥
Probable (B) Expected to occur about once every month or 32,000 operations	🟩	🟨	🟧	🟥	🟥
Occasional (C) Expected to occur about once every year or 390,000 operations	🟩	🟩	🟨	🟥	🟥
Improbable (D) Expected to occur once every 10-100 years	🟩	🟩	🟨	🟧	🟥
Extremely Improbable (E) Expected to occur less than every 100 years	🟩	🟩	🟩	🟨	🟧

Acceptable Risk
Acceptable - This safety risk acceptable without restriction or limitation; hazards are not required to be actively managed but must be documented.

Acceptable Risk with Mitigation
Acceptable with Mitigation - This safety risk is acceptable; however, mitigation, tracking, and monitoring are required.

High Risk
Acceptable with Mitigation - Mitigation must be implemented. Maximum acceptable level of risk. Accountable Executive must approve mitigation strategy. Documentation, tracking, monitoring, and management required.

Unacceptable Risk
Unacceptable - This is an unacceptable safety risk and it cannot be accepted by any level of management until it has been mitigated to an acceptable level.

Short-Term Acceptable - This safety risk is higher than would have been initially acceptable but is allowed to exist while new safety risk controls are developed and implemented.
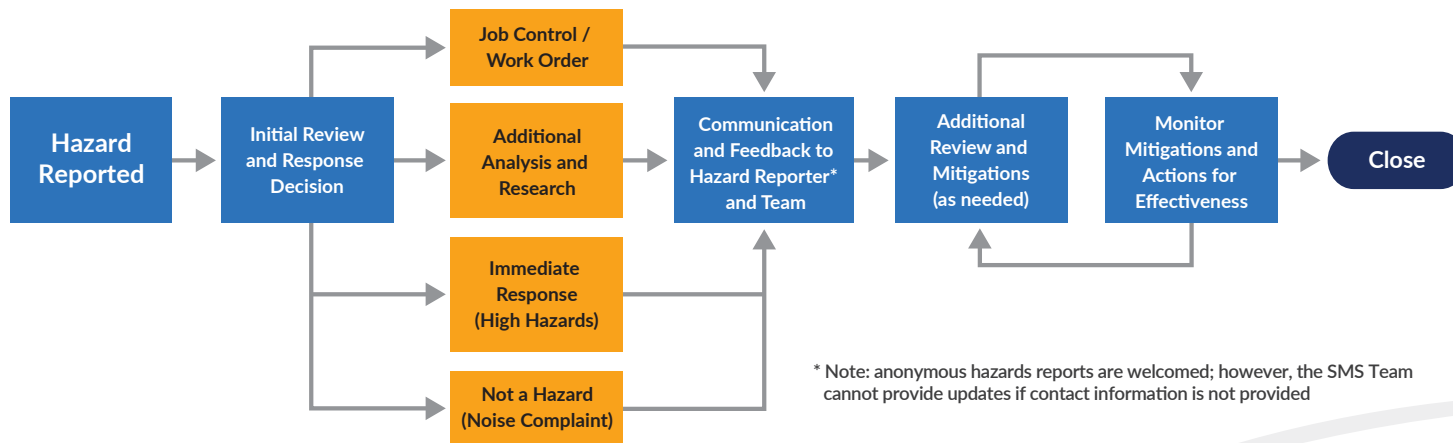
HOW TO REPORT A HAZARD

It is the responsibility of all staff, tenants, and contractors to report hazardous conditions, accidents, incidents, or unsafe actions. If hazards are not reported, they cannot be corrected. It is important to know that when we share information in an SMS, we do so with the intention of learning, not finding fault in one another.

Hazards can be reported in many ways and can be anonymous; contacting the SMS Team as quickly as possible with detailed information will help to resolve safety concerns.

Email Submission	
Phone Submission	
Portal Submission	**HAZARD REPORT**
Job Control Submission	
Work Order Submission	

Portal Submission: www.phl.org/SMS/report-hazard

```
Hazard Reported → Initial Review and Response Decision →
    Job Control / Work Order
    Additional Analysis and Research
    Immediate Response (High Hazards)
    Not a Hazard (Noise Complaint)
→ Communication and Feedback to Hazard Reporter* and Team → Additional Review and Mitigations (as needed) → Monitor Mitigations and Actions for Effectiveness → Close
```

* Note: anonymous hazards reports are welcomed; however, the SMS Team cannot provide updates if contact information is not provided

COMMON DEFINITIONS

Hazard

Any existing or potential condition that can lead to injury, illness, or death; loss of a system, equipment, or property; or damage to the environment. A hazard is a condition that is a prerequisite of an accident or incident.

Risk

The composite of predicted severity and likelihood of the hazard. Risk must be determined through analysis of both severity and likelihood.

Likelihood

The estimated probability, in quantitative or qualitative terms, of a hazard's outcome. Expression of how often an effect is expected to occur.

Control

Anything that mitigates the risk of a hazard's effect. Controls may be recommended when they have the potential to mitigate a hazard.

Note: Per FAA Order 8040.B (May 2017) The terms control, mitigation, and safety risk control are used synonymously.

Worst Credible Outcome

The most unfavorable, yet believable and possible condition given the system state.

Consequence

An outcome that can be triggered by a hazard (loss, damage, injury, fatality). The results of an uncontrolled hazard can be a negative consequence.

Treat

To treat a hazard is different than to control a hazard. Treatment includes options such as mitigation, avoidance, transfer, and acceptance, whereas mitigation only means reduction of the risk's impact.

Severity

The measure of how bad the results of an event are predicted to be. Severity is determined by the worst credible outcome.

Effect

The result of something or the ability to bring about a result. A change which is a result or consequence of an action or other cause.

WEBSITE

www.phl.org/SMS

REPORTING PORTAL

www.phl.org/SMS/report-hazard

EMAIL

PHLSMS@phl.org

PHONE

xSAFE or x7233 *from any airport phone*

215-937-3111 for emergencies

215-937-6868 for maintenance issues

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