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Safety Risk Management

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U.S. Department of Transportation
Federal Transit Administration

Webinar Objectives and Topics

Objectives

- To help transit agencies understand requirements for Safety Risk Management in the Public Transportation Agency Safety Plan (PTASP) regulation at 49 C.F.R. Part 673.

- To support the development of an Agency Safety Plan (ASP).

Topics

- Safety Risk Management definitions

- The Safety Risk Management process

Safety Management System (SMS) Components

What's unique about Safety Risk Management?

Safety Risk Management (SRM) and Safety Assurance (SA) are the key processes and activities for managing safety.

Safety Management Policy (SMP) and Safety Promotion (SP) provide the structure and supporting activities to make SRM and SA possible and sustainable.

Actions   VS   Enablers

Safety Risk Management means a process within a transit agency's Public Transportation Agency Safety Plan **for identifying hazards and analyzing, assessing, and mitigating safety risk**. (§ 673.5)

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How is Safety Risk Management different from Hazard Management?

Hazard Management

- Assumes systems—as designed—are sufficient to prevent hazards.

- Focused on preventing system failures and the damaging outcomes (mishaps) associated with such failures.

- Addresses mishaps resulting from unforeseen hazards through corrective actions.

Safety Risk Management

- Assumes systems are changing.

- Focused on the routine, ongoing capture and analysis of safety information to assess the safety risk of potential consequences of hazards—both foreseen and unforeseen during planning.

- Based on the assessment of safety risk, supports decision-making regarding priorities in allocating safety resources.

Documentation requirements to keep in mind throughout this webinar

Transit agencies must maintain documentation and recordkeeping of: (§ 673.31)

- Establishing the ASP, including documents included in whole or by reference
- Programs, policies, and procedures to carry out the ASP
- SMS implementation
- Results from SMS processes and activities

Transit agencies must maintain these documents for a **minimum of three years** after they are created, and **make them available upon request** by the FTA, other Federal entity, or State Safety Oversight Agency (SSOA).

SAFETY RISK MANAGEMENT DEFINITIONS

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Risk

- A **measure** of severity and likelihood, combined.

- **Predicted**—in the future; hasn't happened yet.

- Measures the **potential effects** of a hazard, not the hazard itself.

- Likelihood (**how often**) vs severity (**how bad**).

§ 673.5 Definitions

Risk means the composite of predicted severity and likelihood of the potential effect of a hazard.

- **Avoid confusing** risk with hazard.

  – We often call something "a safety risk" when we mean "a hazard".

Hazard

- **Real or potential** condition—not an event.
  - **Real**: observable condition that exists in the transit system.
    - For example, worn brakes or a cracked rail fastener.
  - **Potential:** condition that doesn't exist, but could exist if a change is made in the transit system.
    - For example, planning a garage with sharp curves or planning the design of cars with slippery floor material.

- **Can cause** consequences.

> **§ 673.5 Definitions**
>
> *Hazard* means any real or potential condition that can cause injury, illness, or death; damage to or loss of the facilities, equipment, rolling stock, or infrastructure of a public transportation system; or damage to the environment.

Consequence

- Important to consistently distinguish hazards from consequences for accurate safety risk assessment.

- Potential consequences are **the focus of safety risk assessment**.
  - You will **assess** the **severity and likelihood of potential consequences, <u>not</u> hazards.**

- A single hazard could cause multiple consequences.

Not defined in § 673.5, but can be derived from the definition of *Hazard*. Transit agencies may choose to use the following definition:

Consequence means an effect of a hazard, involving injury, illness, or death; damage to or loss of the facilities, equipment, rolling stock, or infrastructure of a public transportation system; or damage to the environment.

Event

- Something that happens, not a condition or state of a system.

- Important to distinguish from a hazard.
  - SRM helps to determine priorities in action, instead of just preventing an event from occurring.
  - A safety event investigation may reveal hazards, which have potential consequences that may include something like the investigated event.

> **§ 673.5 Definitions**
>
> *Event* means any Accident, Incident, or Occurrence.

- Used primarily for reporting, not SRM.
  - Event definitions are based on type of event and magnitude of consequences.

Sample Tool: SRM Definitions Checklist

What is it? If you can select all 3 in one box, it's…	**A Potential Consequence** ❑ Not a real or potential condition ❑ Can be caused by a hazard ❑ Hasn't happened yet, but could be similar to a past event
A Hazard ❑ Real or potential condition ❑ Can cause a consequence ❑ Not an event	**An Event** ❑ Accident, incident or occurrence ❑ Not a real or potential condition ❑ Has already occurred

Example of Hazard vs Consequence

CONSEQUENCE

HAZARD

Near-side bus stop.

Bus pulls away from the near-side bus stop and the car, trying to turn right in front of the bus, collides with the bus.

Risk Mitigation

- A **solution** to a problem, not the problem itself.

- Eliminates or reduces **likelihood and/or severity of consequences**.

- Usually focused on **reducing safety risk to an acceptable level**, not getting the level of risk to 0.

§ 673.5 Definitions

Risk mitigation means a method or methods to eliminate or reduce the effects of hazards.

Engaging Employees in SRM

- Consistently, accurately distinguishing hazards from events, consequences, and mitigations can be challenging.

- Consider how to facilitate discussions about safety throughout the transit agency by reducing the burden of using, training, and enforcing terminology.

For example, in its SRM Pilot, the Chicago Transit Authority **asks individuals to report** whatever concerns them regarding safety— **their safety concerns**. Safety specialists then ensure the safety concerns are properly characterized for analysis.
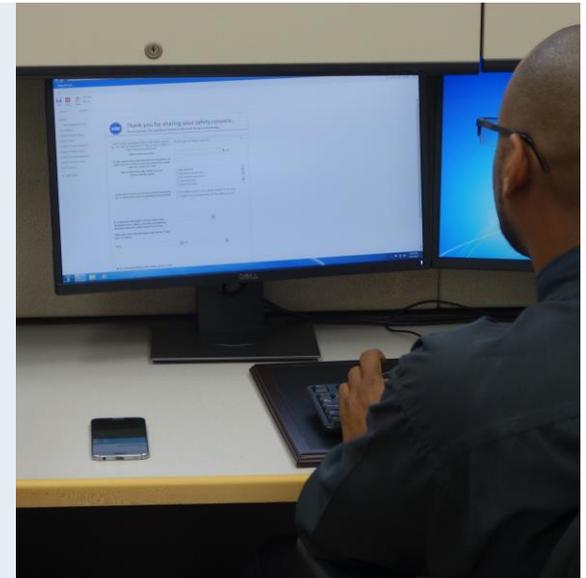
Question 1

Does your agency have a safety department, safety team, or individual dedicated to analyzing safety risk and/or safety mitigations? (Check One)

❑ Safety Risk
❑ Safety Mitigations
❑ Safety Risk and Safety Mitigations
❑ No
❑ I am not sure
❑ N/A

THE SAFETY RISK MANAGEMENT PROCESS

Safety Management Policy Requirements

- For **all elements** of a transit agency's system.

- Consider how you will **develop**, **maintain** and **make available** required documents.

- Detailed documentation can help **increase consistency**, and therefore **confidence** in the process and its results.

- Consider defining **when** SRM is conducted.

> **§ 673.25**
>
> a) Safety risk management process.
>
> A transit agency must develop and implement a Safety Risk Management process for all elements of its public transportation system.

Sample List of Documented SRM Process Elements

❑ SRM definitions.

❑ Roles and responsibilities for the SRM process, including safety risk assessment, safety risk acceptance, and safety risk mitigation.

❑ Sources of information about hazards and consequences, including any forms or tools used by the transit agency to report, receive, and review safety concerns.

❑ Methods, including any forms or tools used, to document hazards and their potential consequences.

❑ Process for assessing the likelihood and severity of a hazard's potential consequences, taking existing mitigations into account, including any tools, forms, or thresholds/matrices used to support and document the assessment.

❑ Approach for prioritizing hazards based on safety risk.

❑ Method for developing safety risk mitigations.

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Developing and Implementing the SRM Process

Transit agencies may find it helpful to consider:

- Different models for conducting SRM, such as:
  - **Centralized** – For example, the Safety Department leads the SRM process, with input from subject-matter experts in operations and maintenance.
  - **Decentralized** – For example, operations and maintenance personnel conduct the assessments, and the Safety Department assists.
- Testing SRM procedures before implementing them agency-wide.
  - Evaluate whether processes, and associated documents, tools, and training, are effective and feasible.

Safety Hazard Identification Requirements

- Must establish how the agency will **identify hazards and consequences**.

  - Defines the scope of SRM.

- A transit agency may look to **employee safety reporting** and **Safety Assurance outputs** (§ 673.27) as sources of information.

  - Particularly, changes that may impact safety performance (§ 673.27(c)(2)).

> **§ 673.25**
>
> b) Safety hazard identification.
>
>   1) A transit agency must establish methods or processes to identify hazards and consequences of hazards.
>
>   2) A transit agency must consider, as a source for hazard identification, data and information provided by an oversight authority and the FTA.

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Sources of Hazard and Consequence Information

- It may be helpful to **consolidate** hazard and consequence **information in one location** for sorting and analysis.

  - For example, managers submit safety concerns into a SharePoint database using a form.

  - For individuals to pull or receive relevant data from different data systems, they may need revised access rights and/or training.

- Hazards and consequences could be submitted directly, or **could be derived from trends or other data analyses**.

  - For example, safety specialists in the Safety Department are responsible for identifying hazards from a quarterly trend analysis of maintenance road calls.

Safety Risk Assessment Requirements

- Must **assess the likelihood and severity** of the consequences of hazards.

  - Including existing mitigations

- Must **prioritize** hazards based on the safety risk of their potential consequences.

- It may help to **define how hazards are selected or prioritized** for their potential consequences to undergo safety risk assessment.

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c) Safety risk assessment.

1) A transit agency must establish methods or processes to assess safety risks associated with identified safety hazards.

2) A safety risk assessment includes an assessment of the likelihood and severity of the consequences of the hazards, including existing mitigations, and prioritization of the hazards based on the safety risk.

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Prioritizing Hazards based on Safety Risk - Examples

- Transit agencies may choose to **develop or adopt a safety risk matrix** to help prioritize hazards based on the safety risk of their potential consequences.

- One example is MIL-STD-882E, but **agencies may consider what approach best meets their needs**, considering, for example:

    - Number of likelihood and severity levels.

    - Number of risk categories.

    - What each category means.

Severity \ Likelihood	1	2	3	4
A	1A	2A	3A	4A
B	1B	2B	3B	4B
C	1C	2C	3C	4C
D	1D	2D	3D	4D
E	1E	2E	3E	4E

Unacceptable under existing circumstances	(red)
Acceptable, but monitoring is necessary	(yellow)
Acceptable under existing circumstances	(green)

Prioritizing Hazards based on Safety Risk - Examples

- Severity and likelihood tables are helpful to **communicate leadership's guidance to support decision-making** (for example, what is unacceptable) and support **consistency of assessments**.

- **Severity** – Consider hazard and event definitions for information to include (for example, damage to the environment).

- **Likelihood** – Consider orders of magnitude, or look at existing frequencies per year. Safety data analysts could help determine denominators (for example, number of daily movements in a rail yard).

- Tables are most useful when they provide **meaningful distinction** between the levels.
- Could have **one or multiple tables for each**. For example, separate likelihood tables for bus operations and bus maintenance.

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Question 2

What method does your transit agency use or plan to use to help prioritize hazards? (Check One)

❑ MIL-STD-882

❑ My agency has developed or will develop a process

❑ I am not sure

❑ N/A

Safety Risk Mitigation Requirements

- Must have methods or processes to **identify necessary mitigations or strategies**.

- **Can reduce risk by reducing either likelihood or severity**. No requirement for a single mitigation to reduce both.

- In identifying and deciding on appropriate mitigations, **consider mitigation monitoring** (§ 673.27(b)(2)).

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d) Safety risk mitigation.

A transit agency must establish methods or processes to identify mitigations or strategies necessary as a result of the agency's safety risk assessment to reduce the likelihood and severity of the consequences.

Sample Guidance for Developing Mitigations

Transit agencies may find it helpful to develop guidance for the individuals charged with identifying appropriate mitigations. This guidance could include categories to consider, such as:

MIL-STD-882E risk mitigation measures

- Eliminate hazards.

- Reduce risk through alteration.

- Incorporate engineered features or devices.

- Provide warning devices.

- Incorporate signage, procedures, training, and personal protective equipment (PPE).

Safety risk mitigation strategies

- Safety risk avoidance

- Safety risk reduction

- Safety risk segregation

Resources to Help You Prepare Now

Read, watch, and participate

- Review the PTASP FAQs

- Visit the PTASP Resources page to view previous webinars and documents

- Participate in webinars explaining PTASP-regulations and guidance

- Read our newsletter, *TSO Spotlight* for PTASP-related articles

Attend a workshop

- FTA will hold PTASP workshops in July, August, and September 2019 for bus and rail transit agencies. The workshops will allow participants to learn more about the rule's requirements, how to implement SMS, and to share best practices.

- Information on the workshops can be found on the FTA website under Calendar of Events and on FTA's PTASP page for registration updates

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PARTICIPANT QUESTIONS

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