

## 25 Safety Focus Areas:

### **Safety Risk Management/ Assessment Processes (6)**

#### Close call reporting

Program established to encourage employees to voluntarily report unsafe conditions or acts. The program is designed to improve safety by collecting and analyzing reports which describe unsafe conditions and events. They are often designed to be confidential and non-punitive in nature.

#### Accident/incident investigation

The industry would benefit from consistent application of event investigation processes, including a standardized taxonomy of transit terminology, and guidance on identifying causal or contributing factors.

#### Fatigue risk management

Fatigue risk management refers to policies, programs, and practices in the industry that are used to reduce safety risks associated with fatigue.

#### Safety risk management and internal SMS evaluation/ assessment

Establishing a standard or recommended practice for conducting SMS evaluations, assessments and audits would assist in ensuring agencies are examining safety management processes. Without specific guidance for conducting effective evaluations, assessments, and audits, there will be a tendency in the transit industry to continue the practice of conducting primarily compliance inspections of vehicles and facilities rather than evaluations, assessments and audits of the SMS.

#### Event data recorders

On-board recorders (electronic data, video and audio) provide a number of safety benefits and can support SMS functions. The resulting data provide incident investigators with better tools and more accurate information to determine causes and corrective actions to prevent future incidents.

### **Procedural (9)**

#### Medical fitness for duty

Employees performing safety critical tasks must be physiologically fit and alert or safety may be compromised. Several catastrophic incidents have been linked to fatigue and/or unidentified medical conditions, such as obstructive sleep apnea or vision impairments.

#### Employee assault prevention (also infrastructure elements)

Both the rate and number of transit worker assaults continue to increase. Voluntary standards or recommended practices could address a range of mitigations – from training, to community outreach, to legislative protections for transit workers, to barriers/screens that protect transit operators while they are on duty.

#### Training

The following topics are covered under the general heading “training.” standards are included within this section:

- Rail Operator Certification/Licensing and Training Standards
- Rail Maintenance Personnel Qualification, Certification/Licensing, and Training Standards
- Bus Operator Certification/Licensing and Training Standards
- Bus Maintenance Personnel Qualification, Certification/Licensing, and Training Standards
- Vertical Transportation Maintenance Personnel Qualification, Certification/Licensing, and Training Standards
- Bus Maintenance Personnel Qualification, Certification/Licensing, and Training Standards
- Bus Operator Certification/Licensing and Training Standards

### Transit operations control center

Operations Control Centers play a crucial role in the safe operation of transit systems. Standards or recommended practices could be developed to address Transit Operations Control Centers (OCCs) to ensure transit systems meet minimum requirements for OCC operations, procedures and processes.

### Transit scheduling/operator break times

Transit scheduling and vehicle operator break time are generally driven by customer service considerations and collective bargaining agreements. Schedules that are “too tight,” coupled with an emphasis on schedule adherence can have safety implications and potentially compromise safe operations. Many transit operators complain that schedule delays lead to limited time at the end of a trip to address personal needs like visiting the restroom. This area is ripe for additional research and standards development.

### Emergency preparedness

The standardization of Emergency Management Plans that includes recommended practices for training and exercise, would be beneficial to all transit agencies in meeting FTA and Department of Homeland Security (DHS) emergency management and emergency preparedness requirements.

### Operational rules, practices, and procedures

Safety and operating rules are developed by transit agencies to mitigate potential hazards and to prevent accidents. Generally, operating rules relate to the day to day operations of the transit system vehicles – on the streets or on fixed guideways. Rules compliance is an important element of safety assurance.

### Fire/life safety

National Fire Protection Association (NFPA) 130: Standard for Fixed Guideway Transit and Passenger Rail, along with standards that have been adopted by FRA and APTA address fire/thermal events and the design and procedural aspects that must be utilized by the industry to reduce injuries and fatalities associated with these events. Encouraging the use of these regulations and standards will ensure consistency throughout the transit industry and enhance the safety of transit systems.

### Vehicle (bus) safety and maintenance

The proper design, construction, and maintenance of buses are essential to providing safe transportation for transit customers, pedestrians, cyclists, and other motor vehicle operators. Federal Motor Vehicle Safety Standards (FMVSS) include requirements for transit buses, though limited, and commercial motor vehicles operated by transit agency personnel. An evaluation of the NTSB Recommendations establishes the applicability of these findings to transit buses.

## Rail Infrastructure/Technologies (10)

### Passenger vehicle workstations

This topic refers to both the design of bus and rail operator workstations and spans multiple topics including: line of site considerations and the limitations to line of site from A-pillar designs and mirror designs/placement, ergonomic considerations, range of motion stresses, seat and pedal vibrations, designs that can prevent/reduce the likelihood of transit worker assaults, cognitive overload considerations, etc.

### Passenger vehicle safety (includes crashworthiness/CEM)

Proper design, construction and maintenance of passenger rail vehicles is essential to safety. Derailments and collisions can, and on occasion have, occurred due to vehicle related safety shortcomings. When an incident does occur, improved crashworthiness and emergency ingress/egress can save lives and reduce injury severity.

### Rail/highway grade crossings

Incidents at grade crossings are one of the most frequent type of mishaps on rail transit systems. Ensuring that roadway and pedestrian crossings of rail system tracks are designed, constructed and maintained to appropriate standards is critical to transit safety and minimizing risk.

### Rail maintenance-of-way equipment

Virtually all fixed guideway transit operators use (or contract for) on-rail equipment to perform maintenance-of-way (MOW) work. Operation of this equipment carries the same risks (e.g.: derailment, collision, fire) as passenger equipment.

### Rail signals and communication systems

Rail signal systems are designed, at a minimum, to prevent train to train collisions and may also serve to prevent stop signal overruns, exceeding civil speed, work zone excursions movement through improperly aligned switches. All these functions are safety critical and rely on properly designed, constructed and maintained signal systems. Recognizing and addressing cybersecurity implications related to these systems are critical.

### Rail track and structures

Maintaining track and structures in good repair is essential to the safety and efficiency of rail operations. Inadequate maintenance and repair increases the risk of derailments and injuries. Given aging infrastructure and capital funding limitations, adhering to appropriate track maintenance standards has become increasingly important for safe rail transit operations.

### Rail tunnels

After the WMATA L'Enfant Station accident in 2015 where electric arcing of a circuit due to prolonged moisture from tunnel leakage caused a passenger train to stop in the tunnel, the National Transportation Surface Board (NTSB) issued two recommendations directed at the FTA. Delays in evacuations from the passenger train in the tunnel were caused by the smoke in the tunnel, failed ventilation fan components, and lack of emergency egress (lighting and walkways) in the tunnel

In addition, considerable work has been done examining the maintenance of transit rail tunnels, including the conduct of a survey of rail transit systems. About half of rail transit tunnels were built over

50 years ago and about 15 percent of tunnels were built over 100 years ago. Despite these aging tunnels, only 20 of U.S. rail transit tunnels have been rehabilitated in full or partial. Along with overdue maintenance, agencies are having significant issues with ground water intrusion, and the structural repair of concrete, steel, and masonry while trying to maintain transit services.

#### Rail traction power electrification equipment

Rail traction and power electrification equipment and systems are associated with the distribution and contact of power to tracks and vehicles. This includes 3<sup>rd</sup> and 4<sup>th</sup> rail and catenary systems, as examples. Voluntary standards or recommended practices could be used to reduce the risks associated with the maintenance and upgrade of these systems, and construction or rehabilitation processes, as examples.

#### Rail vertical transportation systems

Escalators and elevators are designed, installed and maintained in accordance with the American Society of Mechanical Engineers, ASME A17.1, Safety Code for Elevators and Escalators. However, these are considered minimum requirements and have been proven to be insufficient for escalators and elevators installed and used in North American transportation systems. Because of the harsh, heavy-usage, high-abuse environment of transportation systems heavy-duty escalators and elevators are required in transit facilities.

#### Right-of-way worker protections

Collisions with right of way workers and the unfortunate corresponding injuries and fatalities represent one of the highest areas of risk in the transit industry. Best/model practices, utilization of the latest technologies, and improved policies and practices for both primary and secondary warning and prevention systems can mitigate these risks.