

# The Washington Metrorail Safety Commission

## Safety Audit

of the Washington Metropolitan  
Area Transit Authority



## Audit of Emergency Management and Fire and Life Safety Programs



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Prepared under the authority of the Washington Metrorail Safety Commission

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# Executive Summary

**The WMSC is issuing 14 findings requiring Metrorail to develop corrective action plans (CAPs). The WMSC is also issuing 5 recommendations that Metrorail must address.**

The Washington Metrorail Safety Commission (WMSC) performed this audit of the Washington Metropolitan Area Transit Authority (WMATA) Metrorail's emergency management, emergency preparedness, and fire and life safety practices through in-depth interviews, site visits, and document and data reviews conducted in 2021.

The Federal Emergency Management Agency (FEMA) views emergency preparedness as the continuous cycle of planning, organizing, training, equipping, exercising, and taking corrective action to ensure effective and coordinated incident response and management. The National Fire Protection Association (NFPA) notes that fire and life safety systems include mechanical, electrical, communications, control, fire protection, structural and architectural elements that must function as a system to achieve the desired safety results. This audit focused on these interrelated functional areas.

The scope of this audit includes physical assets such as standpipes and emergency egress paths or shafts as well as other critical aspects of emergency management such as emergency procedures and communication. This audit assesses and evaluates operational practices, procedures, maintenance, installed equipment, system modifications and associated training. These are assessed in relation to rules, procedures, regulations and best practices, and the related aspects of Metrorail's safety plans governing policy and procedure development, implementation and compliance, management structure, planning and governance, and associated training. Given the wide array of emergency preparedness and fire and life safety assets at Metrorail, and the nature of rail transit operations, a wide variety of Metrorail's organizational units may be involved in an emergency, emergency response or maintenance and inspection of emergency assets. The WMSC appreciates the cooperation of Metrorail personnel during this audit.

The audit demonstrates that Metrorail has made some improvements since the 2015 smoke accident near L'Enfant Plaza Station, including markedly improved training and system familiarization for local first responders.

However, this audit also demonstrates that there are many critical areas where Metrorail is not meeting its own written requirements, does not have adequate procedures, processes or requirements, or does not have adequate training, coordination and supervision. As a result, the WMSC is issuing 14 findings requiring Metrorail to develop corrective action plans (CAPs). The WMSC is also issuing 5 recommendations that Metrorail must address.

The WMSC communicated safety concerns to WMATA as they were identified during this audit process.

As described in the findings below, Metrorail does not consistently follow the incident command system (ICS) structure and has procedures that do not comply with National Incident Management System (NIMS)/ICS requirements such as the use of plain language. Further, Metrorail's training requirements are insufficient to prepare personnel to respond to and/or manage emergencies





within the NIMS/ICS framework. These deficiencies have contributed to ineffective and improper emergency response and emergency management.

Metrorail created and implemented an "Incident Management Official" (IMO) position without documented training, responsibilities, communication, or coordination, and without adequate staffing to ensure other emergency management and preparedness activities were not interrupted.

Metro Transit Police Department (MTPD) personnel routinely enter the roadway despite not having RWP qualifications required by Metrorail rules and procedures, exposing themselves and others to the risk of serious injury or death. MTPD general orders do not reflect current operational realities and procedures, and areas for improvement from prior events are not effectively communicated to frontline MTPD personnel.

During emergencies, Metrorail's calls to public safety answering points (911 call centers) are inconsistent, incomplete and contribute to delayed or ineffective emergency response.

In relation to the roles of other Metrorail personnel, Metrorail does not ensure that experts in fire and life safety are included in and have a documented role in Metrorail project development, planning, review and approvals, which contributes to hazards being introduced into the Metrorail system or hazards being allowed to continue to exist without adequate mitigation. Metrorail has not clearly defined and communicated the authority and duties of its Fire Marshal and any other fire prevention roles or positions, and does not have effective continuity plans in the event the Fire Marshal is unavailable. There is inadequate coordination among organizational units charged with developing, inspecting and maintaining critical fire and life safety assets, and there is no unified process to identify, prioritize and address fire and life safety risks.

Metrorail does not routinely conduct hazard assessments to evaluate and prioritize fire and life safety and emergency management issues. Further, Metrorail has not established a fire and life safety and emergency management hazard identification, tracking and open item resolution process for prioritizing and implementing safety improvements.

Concerning its physical assets, emergency equipment in station medical cabinets is expired and covered in dirt. There is no inspection procedure or responsible party assigned to inspect and maintain this safety equipment. Metrorail does not conduct systematic underground inspections to ensure safe egress and fire and life safety response, and has set minimum tunnel emergency lighting levels that are not compliant with NFPA minimum standards. Metrorail does not consistently inspect and maintain current certification status of all fire extinguishers, particularly those on the roadway. Metrorail does not consistently perform or document all elements of its Fire & Intrusion Alarm System Inspection Preventive Maintenance Instructions.

**MTPD personnel routinely enter the roadway despite not having RWP qualifications required by Metrorail rules and procedures, exposing themselves and others to the risk of serious injury or death.**



**Emergency equipment  
in station medical  
cabinets is expired and  
covered in dirt.**

In addition, the exit stairwell from Rosslyn Station is not protected from obstructions, which creates a risk that the hatch will not be able to be opened in an emergency, trapping customers inside.

The recommendations in this audit relate to opportunities to improve and expand training and training coordination related to fire and life safety and emergency management, MTPD checklists in emergencies, consistency of fire and life safety signage throughout the system, Metrorail's organizational structure, and identification and communication of radio system outages to MTPD officers.

WMATA is required to propose a Corrective Action Plan (CAP) for each finding and to respond to each recommendation no later than 30 days after the issuance of this report.







## **Background** and Scope

# Background and Scope



**Together, these processes, procedures and systems are critical to proper emergency response to provide for the greatest level of safety for passengers, workers and first responders in relation to emergencies such as fire, smoke or derailment.**

The scope of this audit includes Metrorail's programs, procedures and equipment related to emergency management and fire and life safety.

The Federal Emergency Management Agency (FEMA) views emergency preparedness as the continuous cycle of planning, organizing, training, equipping, exercising, and taking corrective action to ensure effective and coordinated incident response and management. The National Fire Protection Association (NFPA) notes that fire and life safety systems include mechanical, electrical, communications, control, fire protection, structural and architectural elements that must function as a system to achieve the desired safety results. This audit focused on these interrelated functional areas.

This includes physical assets such as standpipes and emergency egress paths or shafts as well as other critical aspects of emergency management such as emergency preparedness, procedures and communication. Preparedness includes a continuous cycle of planning, organizing, training, equipping, exercising, evaluating and taking corrective action. Fire and life safety systems include mechanical, electrical, communications, control, fire protection, structural, architectural and other elements that function together as complete systems. According to WMATA, the physical assets include more than 100 exit shafts, more than 4,500 fire extinguishers, more than 100 WMATA-owned fire hydrants, approximately 200 Emergency Tunnel Evacuation Carts (ETECs) used to assist with the evacuation process when needed by allowing the movement of people or equipment on a cart that rolls on the rails, various suppression systems and standpipes used to provide water flow for firefighters in an emergency, and fire alarm systems.



Together, these processes, procedures and systems are critical to proper emergency response to provide for the greatest level of safety for passengers, workers and first responders in relation to emergencies such as fire, smoke or derailment.

This audit assesses and evaluates operational practices, procedures, maintenance, installed equipment, system modifications and associated training. These are assessed in relation to rules, procedures, regulations and best practices, and the related aspects of Metrorail's safety plans governing policy and procedure development, implementation and compliance, management structure, planning and governance, and associated training.

Among other areas, the audit focuses on elements of the System Safety Program Plan (SSPP) for the period through December 31, 2020, and, for more recent information, elements of WMATA's first Public Transportation Agency Safety Plan (PTASP), titled the WMATA Transit Agency Safety Plan, which replaced the SSPP



on December 31, 2020. Prior to final publication of this audit, Metrorail's first revision of its PTASP took effect. All references in this audit report to the PTASP reflect the version that was in effect at the time this audit work was conducted. Due to the timing of the PTASP's initial approval in late 2020, and the required phased approach for effective implementation, aspects of the PTASP had not yet been implemented in this area at the time of this audit. The specific elements of the SSPP and PTASP covered in this audit are listed in Appendix D.

## Open Corrective Action Plans (CAPs)

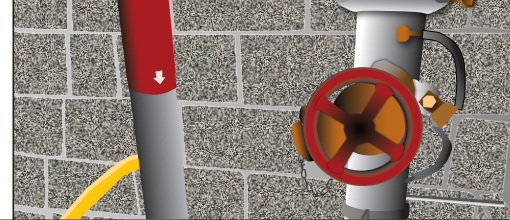
At the time of this audit, CAPs that were open and directly related to emergency management and fire and life safety included ROCC Audit CAPs C-0052 related to inconsistent and unreliable communication with the fire liaison, and C-0053 related to procedures that lack the required urgency to address life-safety issues.

The WMSC issued several other findings in this area in 2019 and 2020, including findings that Rail Traffic Controllers were not prepared to operate the emergency ventilation fans to respond to smoke and fire events, which could lead to a repeat of the January 12, 2015 L'Enfant Plaza Station electrical arcing and smoke accident, that third rail power restoration was routinely rushed by Rail Operations Control Center (ROCC) management in violation of safety rules, and that there was chaos and dysfunction in the ROCC during unplanned events and emergencies. Although some of the corrective action plans for these findings issued in 2019 and 2020 have been completed, others remain in progress.

At the time of this audit, the National Transportation Safety Board (NTSB) classified 13 safety recommendations to WMATA as open, including several that were classified due to WMSC findings as open-unacceptable response. The corrective actions the WMSC requires Metrorail to complete to address the findings noted above are intended to address a number of these issues, including the need to review and revise emergency response procedures for smoke and fire.

The NTSB classified other recommendations, such as the review and revision of quality assurance programs to ensure regular quality assurance audits are conducted and procedural noncompliance is corrected, as open-acceptable response. The NTSB closed this recommendation, R-16-031, on October 12, 2021.

More recently, the WMSC issued a finding on August 13, 2021 requiring Metrorail to develop a CAP (C-0118) to address Metrorail's noncompliance with its Safety and Security Certification Program Plan (SSCPP). This finding was based on information identified during WMSC oversight work including inspections, document reviews, interactions with Metrorail personnel, and work on audits including this one. Information related to this finding that was identified during this audit is included below as relevant, including in Findings 6 and 7.



**In intervening years, the Metrorail system and organization grew and evolved, including the creation of the Office of Emergency Management (OEM) in 2008 under the Metro Transit Police Department (MTPD).**



## History

Metrorail's emergency management and fire and life safety programs and assets were a focus of detailed investigation and review in 2015 and 2016, following the fatal January 12, 2015 electrical arcing and smoke accident near L'Enfant Plaza Station. Elements of these areas were also examined in 2009 and 2010 following the fatal June 22, 2009 Red Line accident involving the collision of two Red Line trains near Fort Totten Station. These events were the subject of National Transportation Safety Board (NTSB) investigations. In 2015, the Federal Transit Administration (FTA) conducted a Safety Management Inspection (SMI) of Metrorail and later assumed direct safety oversight of Metrorail. Direct FTA oversight continued until the WMSC was created and the FTA certified the WMSC's safety program in March 2019.

Aspects of Metrorail's emergency management and fire and life safety programs had also been reviewed in prior investigations, such as the NTSB investigation into the fatal January 1982 derailment at Smithsonian Interlocking, which identified "extended and unnecessary delays in starting evacuation" that resulted from a "failure to authorize, direct and coordinate the evacuation through Metrorail supervisors and employees on the scene."

"Response by the Fire Department to the emergency was delayed by the OCC [Rail Operations Control Center] unnecessarily taking time to first determine the precise location of the derailment, [and] by the OCC's directing the Fire Department to the least accessible and most congested entrance to the subway," the NTSB found.

Among other safety recommendations as a result of that event and investigation, the NTSB recommended Metrorail implement a continuing program to educate passengers on the procedures to be followed when it is necessary to evacuate a disabled train (R-82-18). Today, Metrorail has signage in each railcar detailing these steps as recommended by recommendation R-82-72 which was issued as part of the NTSB's final investigation report.

The NTSB investigation of the 1982 derailment also recommended train operators be provided handheld radios that function in the event power is lost to a train, significant improvements to training and operational procedures and supervisory oversight, the addition of marked emergency escape windows on all Metrorail cars, emergency lights on each Metrorail car, and expanded frequency and scope for "Disaster Crash Simulations" (emergency drills).

In intervening years, the Metrorail system and organization grew and evolved, including the creation of the Office of Emergency Management (OEM) in 2008 under the Metro Transit Police Department (MTPD). According to those directly involved in OEM's development, the placement of OEM within MTPD was based in large part on MTPD's role as Metrorail's emergency response function.

The NTSB investigation into the fatal 2015 electrical arcing and smoke accident near L'Enfant Plaza station identified safety issues related to Metrorail's tunnel ventilation,



railcar ventilation, emergency response, response to smoke reports, and Metrorail's oversight and management (such as failure to effectively institute lasting change).

Recommendations from the investigation into the 2015 accident included:

- Reviews of first responder preparedness to respond to events in the underground portions of the Metrorail system
- Improvements to 911 call processing
- Mitigation of water intrusion into tunnels
- Improvements to tunnel ventilation fan capacity
- Improved Metrorail procedures, training and practical experience on the use of emergency ventilation fans
- Development, training on implementation of and oversight of compliance with procedures for response to smoke alarms
- Installation and maintenance of a system to detect the presence and location of fire and smoke in stations and tunnels
- Development of procedures for the testing of smoke detectors
- Revisions to smoke-related SOPs to specify the trains that must be stopped until a source of smoke is identified and to ensure that some reports are not investigated using trains carrying customers
- Review and revision of ROCC emergency response procedures for smoke and fire
- Retraining and improved training of ROCC personnel
- Installation of line identification and direction signage at tunnel entrances and inside tunnels
- Regular inspection and removal of obstructions from safety walkways and track-bed floors
- Conducting emergency response drills with local emergency response agencies including documentation and implementation of lessons learned
- Procedural changes to require after-action reviews
- Revised quality assurance programs to ensure internal audits identify and correct procedural noncompliance



The FTA's Safety Management Inspection (SMI) of WMATA conducted in 2015 also identified safety deficiencies, including those related to ROCC training, staffing, available checklists and procedures, and the quality of the radio system and radio communications. Among other findings specifically related to fire and life safety and emergency preparedness, the FTA found that WMATA did not have a clear strategy for the development or delivery of emergency response training to frontline



personnel or for managing the logistical challenges associated with coordinating familiarization training with local emergency responders. The FTA also found that priority maintenance work for fire and life safety systems with shared departmental responsibilities for inspection and maintenance was not being completed as required, and that WMATA had to do more to prevent and manage conditions that cause smoke in tunnels. In addition, Metrorail was not completing required ventilation fan inspection and maintenance procedures, and the FTA determined that Metrorail had to look for opportunities to improve ventilation performance and capacity.

Tri-State Oversight Committee (TOC) audits of Metrorail's emergency management and subway emergency egress and equipment that were conducted in 2014 (final reports issued in 2015) found, among other things:

- A lack of formal training on subway emergency egress and equipment inspections
- A lack of specific procedures for lighting inspection of emergency egress shafts
- Obstructed emergency egress paths
- No regularly scheduled inspections of emergency phones in areas of rescue assistance
- A lack of consistent understanding of required responses to intrusion alarms
- Equipment not being inspected after emergency events
- No easily usable inventory of all fire and life safety assets in the Metrorail system
- A lack of procedures for notifying first responders of emergency egress paths that are removed from or restored to service
- Not all gaps identified as a result of emergency exercises and drills were being rectified
- Metrorail was not tracking and resolving gaps and recommendations identified by regional first responders
- Metrorail was not complying with quarterly testing specified by its continuity of operations plan (COOP)
- Metrorail was not complying with procedure requiring quarterly tests of a chemical detection system
- Metrorail had not replaced its Emergency Response Training program for frontline personnel that was discontinued in 2013 (Joint Supervisory Training continued for supervisors only)
- OEM's responsibilities were not captured by job descriptions or procedures, including the rush-hour MTPD liaison role in the ROCC

The TOC's Subway Fire-Life Safety Equipment and Lighting Audit conducted in late 2017 (final report issued in February 2018) identified deficiencies in WMATA's SSPP related to fire and life safety equipment, egress and lighting maintenance, a lack of





definition of what qualified as a fire and life safety asset that needed to be prioritized for repairs, inadequate fire watch requirements when escalator deluge systems are off, a lack of policies or procedures specifying the scope, responsibilities and authorities of the Fire Marshal's office or other fire and life safety roles, that some preventive maintenance inspections (PMIs) were not being completed, and that there was no process to ensure that emergency egress areas such as safety walks remain clear of debris and equipment at all times.

More recently, WMSC inspections, other oversight work, and multiple safety event investigations have identified areas that require improvements.

For example, investigation W-0084 demonstrated that the Metro Transit Police Department (MTPD) is not following critical aspects of safety procedures that are required during emergencies. Customers on two trains were stranded on the Green and Yellow Lines near Fort Totten and Georgia Ave-Petworth stations when power de-energized and could not be restored remotely. MTPD officers eventually evacuated customers to the roadway without safety precautions required by Metrorail rules and procedures such as Warning Strobe and Alarm Devices (WSADs). MTPD took this action over the safety-based objections of D.C. Fire and EMS personnel who wanted to follow proper safety procedures. Due to MTPD not following safety procedures, D.C. Fire and EMS personnel remained on the platform for their own safety.



Investigation W-0113, related to an evacuation of Capitol South Station on May 13, 2021, provides an example of Metrorail not following the incident command system, and the MTPD officer not incorporating into the U.S. Capitol Police incident command structure to ensure actions were coordinated. This resulted in confusion about the station's status for safe operations.



In addition, Metrorail's management of emergencies on October 9, 2020 related to a train pull-apart near Union Station (investigation W-0079) and a disabled train event on March 26, 2021 that included a runaway train near Rhode Island Ave-Brentwood Station (W-0116) demonstrated deficiencies in Metrorail's emergency preparedness, coordination and response and associated life-safety processes. In both of these events, MTPD personnel did not immediately respond to the location of the disabled train, there was confusion related to the incident command structure and process, calls to the Office of Unified Communications (Washington, D.C.'s public safety answering point that handles 911 calls) were not made clearly and in a timely

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fashion, and Metrorail spent excessive time troubleshooting or otherwise working on alternative plans for resolving the emergencies. This left customers stranded for extended periods and contributed to self-evacuations.

Related to fire and life safety programs, investigation W-0111 of a serious employee injury at Shaw-Howard U Station on April 12, 2021 identified that Metrorail had not provided adequate training and direction to fire protection technicians performing standpipe flow and hydrostatic testing. Metrorail had not completed the process of developing, distributing and providing training on checklists or similar test forms for this task, despite previously representing that this implementation process was complete. As a part of this investigation, Plant Maintenance and the Office of Emergency Management worked to finalize what Plant Maintenance then described, after submission to the WMSC, as draft checklists and procedures. Following this event, Metrorail conducted a job hazard analysis for standpipe and hydrostatic testing. This analysis determined that additional training is required for Plant Maintenance technicians performing this work, including on additional forms and on National Fire Protection Association (NFPA) Standards 14, 25 and 130. Corrective actions for this item are being monitored through the recommended corrective action (RCA) process associated with investigations.

Other events, inspections and audits, such as the Automatic Train Control and Signaling Audit issued in May 2021 and investigation W-0109 related to a Roadway Maintenance Machine derailment near Farragut West Station on April 29, 2021 have also identified that some employees are not familiar with safety or emergency response requirements.

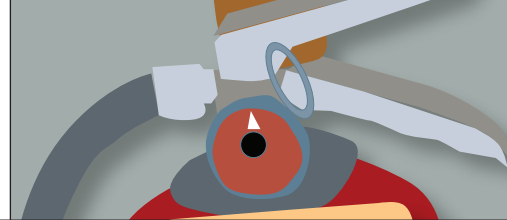
## Current Structure

Given the wide array of emergency preparedness and fire and life safety assets at Metrorail, and the nature of rail transit operations, a wide variety of organizational units may be involved in an emergency, emergency response or maintenance and inspection of emergency assets.

Metrorail's Public Transportation Agency Safety Plan (PTASP) states that emergency management functions are led by **Metro Transit Police Department (MTPD)**. This includes developing, maintaining and taking the lead in implementing emergency management documentation, such as the assignment of employee responsibilities during an emergency and coordination with federal, state, regional and local officials with roles and responsibilities for emergency preparedness and response. MTPD is also listed in the PTASP as responsible for maintaining jurisdictional agreements, and is responsible for corrective action arising out of emergency management in coordination with other departments.







Although that is specified in the PTASP in effect at the time of this audit, Metrorail stated that it reassigned some of these functions to the Department of Safety and Environmental Management (Safety Department/SAFE) beginning in spring 2021. The realignment of some of these functions to fall under SAFE's responsibility was later reflected in Metrorail's PTASP revision that was adopted by the WMATA Board of Directors in October 2021 and approved by the WMSC Commissioners in December 2021. Metrorail initiated this change after the WMSC independently identified and required Metrorail to properly report and investigate the March 26, 2021 runaway train event near Rhode Island Ave-Brentwood Station. These adjustments included elements of the Office of Emergency Management (OEM) moving from MTPD to SAFE. The OEM Director remained under MTPD, and the revised PTASP maintained MTPD's responsibilities for on-scene emergency response, including responsibility to serve as incident commander during life-safety events. Other OEM personnel stated during this audit that their duties had not significantly changed under the new reporting structure. At the time of this audit, SAFE was developing plans for a new Office of Emergency Preparedness (OEP) that would include a significant portion of OEM's responsibilities. MTPD remains directly involved in many aspects of emergency management, preparedness and response, including MTPD officials being designated as incident commander.

**The Safety Department** also leads other aspects of emergency preparedness, fire and life safety and related functions. This includes the work of Metrorail's Fire Marshal and a separate team that oversees the safety certification process for each Metrorail project. Safety certification requires long-term continuing coordination among multiple departments and contractors such as Capital Delivery (CAPD), Procurement (PRMT), Strategy, Planning and Program Management (SPPM) to ensure that this process, including all appropriate approvals from emergency preparedness and fire and life safety experts, is conducted to help make each project as safe as practicable.

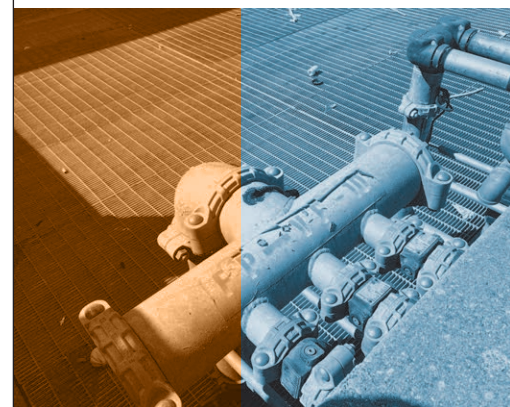
**Engineering and Architecture (ENGA)** responsibilities include design review and setting standards for standpipes, sprinklers and new construction.

**Plant Maintenance (PLNT)** conducts day-to-day inspections, maintenance and repairs of many fire and life safety assets and structures, including sprinklers and standpipes.

**Traction Power Operations Engineering (TPOE)** within Maintenance of Way Engineering (MOWE) has responsibilities related to the design, standards or unusual troubleshooting for emergency trip station (ETS) buttons that can be used to de-energize third rail power in the event of an emergency. Traction Power Maintenance (TRPM) inspects and repairs these aspects of ETS boxes on a day-to-day basis, and will repair a single blue light out on a specific box. Low Voltage Power is responsible for the electrical circuits that supply power to those blue lights.

**Information Technology Network and Communications (ITNCS)** inspects and repairs the phones in ETS boxes and other similar emergency communications equipment such as phones in areas of refuge.

**MTPD is directly involved in many aspects of emergency management, preparedness and response, including MTPD officials being designated as incident commander.**



**Throughout the audit process, the WMSC raised specific safety issues to Metrorail personnel as they were identified.**

In the event of an emergency in the system, **Rail Transportation (RTRA)** or personnel from other departments are frequently the first on scene, and therefore have responsibilities related to reporting and immediate life-safety response. These individuals also have responsibilities under the incident command structure, which Metrorail generally refers to as activating SOP 1A (command, control and coordination of emergencies on the rail system). The in-effect SOP 1A at the time of this audit was dated 2015.

**The Rail Operations Control Center (ROCC)** generally is responsible for calling for first responder assistance, coordinating operations, maintaining clear communication and awareness, and following NIMS/ICS requirements based on direction from the incident commander on scene. Inside the ROCC, a fire liaison employed by local jurisdictions provides real-time information over fire department radio systems to local fire departments responding to events in or around the Metrorail system. This liaison position is currently staffed by uniformed officers from jurisdictional fire departments. The jurisdictions are in the process of shifting to using retired officers who would serve in this position exclusively, rather than rotating between this position and other fire department responsibilities.

In April 2021, after the WMSC identified and required Metrorail to properly report the runaway train event near Rhode Island Ave-Brentwood Station, Metrorail also instituted what it called an Incident Management Official (IMO) in the ROCC. This is described further in Finding 2 of this audit.

## **Audit Work**

The WMSC received initial documents related to this audit from WMATA in July 2021, conducted extensive interviews and site visits in August 2021, and received follow-up documents and conducted document reviews into September 2021.

Throughout the audit process, including during site visits, interviews, and follow-up conversations the WMSC raised specific safety issues to Metrorail personnel as they were identified. This includes safety deficiencies related to the Red Line Tunnel Ventilation Pilot Project (see Findings 6 and 7), obstructed or potentially obstructed egress paths (see Finding 12 and Other Observations), signage and other issues noted below.

Lists of documents reviewed, site visit locations, and personnel interviewed for this audit are provided in the appendices.

An exit conference was held on September 1, 2021 with Metrorail staff to summarize the status of the audit to that point.

The WMSC later provided a draft of this report to WMATA for technical review and incorporated any technical corrections as appropriate.







What the **WMSC** Found

# What the **WMSC** Found

**The training that is provided to local fire departments represents a substantial improvement since the 2015 smoke accident near L'Enfant Plaza Station.**

## Positive Practices

This audit identified that Metrorail has made improvements in some areas of emergency preparedness and fire and life safety programs since 2015. The WMSC identified a number of positive practices while conducting this audit including:

- Metrorail has been providing training and familiarization for local fire departments on a regular basis. The training that is provided represents a substantial improvement since the 2015 smoke accident near L'Enfant Plaza Station, and it has increased the comfort-level of firefighters with the Metrorail system (see Finding 2 for temporary disruptions to this training due to Metrorail organizational changes).
- All defibrillators checked by the audit team were present and had current calibration dates, generally expiring in December 2022.
- First aid kits were present in station kiosks in all locations checked.
- Emergency Tunnel Evacuation Carts (ETECs) were present in all locations checked.
- Emergency and informational intercoms and call boxes that were tested were functional to reach the station manager, ROCC or Security Operations Control Center (SOCC) used by MTPD dispatch.
- Metrorail recently updated its Fire Watch Manual in April 2021. It clearly identifies responsible parties, necessary information and procedures.
- Metrorail has replaced metal caps with plastic caps on numerous standpipes in an effort to reduce theft of the metal caps so that the standpipes remain in service without disruption.
- Site visits identified working emergency exit bars next to fare gates.
- Site visits identified the proper use of spill pallets in ancillary rooms at stations.







- Site visits identified a good solid barrier around a fire protection pipe in exit stairs at Navy Yard-Ballpark Station's Half Street exit to properly direct people through an exit door.
- Preventive Maintenance Inspections (PMIs) for fire and life safety systems are automatically scheduled and tracked in Maximo on a recurring basis.
- Metrorail modified full-scale exercises to allow some training while maintaining COVID-19 safety requirements. This included establishing skills stations that small groups could rotate through to experience incident command, being on the roadway, safety tools such as hot sticks and warning strobe and alarm devices (WSADs), and railcar familiarization.
- In early 2021, following WMSC feedback, the WMATA Fire Marshal began biweekly meetings with departments responsible for fire and life safety assets in an effort to establish accountability for and ongoing communication regarding fire and life safety issues that the Office of the Fire Marshal has identified as requiring corrective maintenance or other safety improvements.





**These deficiencies in compliance with NIMS and ICS present an impediment to an efficient and coordinated emergency response.**

## Findings and Minimum Corrective Actions

**Metrorail does not consistently follow the incident command system (ICS) structure and has procedures that do not comply with National Incident Management System (NIMS)/ICS requirements such as the use of plain language. Further, Metrorail's training requirements are insufficient to prepare personnel to respond to and/or manage emergencies within the NIMS/ICS framework. These deficiencies have contributed to ineffective and improper emergency response and emergency management.**

The National Incident Management System (NIMS), which includes an integrated Incident Command System (ICS), is a standardized, comprehensive incident management structure that provides shared terminology, systems and processes across organizations (including Metrorail, local fire departments and other emergency responders) for emergency management and response to maximize available resources and promote safe and efficient management of incidents. NIMS was developed and implemented nationwide following Homeland Security Presidential Directive 5 issued in February 2003.

Although the first responders such as fire and police departments that respond to Metrorail emergencies conduct their activities in accordance with NIMS and ICS, Metrorail's practices do not comply with these standards. Review of procedures for this audit, interviews for this audit, and reviews of Metrorail actions during emergencies demonstrate deficiencies including noncompliance with incident command processes. These deficiencies in compliance with NIMS and ICS present an impediment to an efficient and coordinated emergency response.

For example, Metrorail's procedures describe an "on-scene commander," a term that does not exist in the NIMS/ICS structure, and a term that WMSC audit interviews, inspections and investigations have demonstrated regularly leads to confusion for responders from outside of Metrorail such as the jurisdictional fire departments. The term even exists in MTPD general orders immediately following a statement that WMATA will comply with NIMS and ICS, including the use of plain language. NIMS requires the use of consistent, common terminology, while avoiding overuse of acronyms. ICS requires a standardized, unified command and control structure that is scalable to include small scale events or larger emergencies involving multiple entities or agencies such as Metrorail staff and local fire department personnel.

Metrorail has a number of procedures that accurately describe what could happen if Metrorail actually utilized unified command during emergency response; however, audit interviews, inspections, investigations, and other oversight work demonstrate that Metrorail does not utilize a unified command structure with the shared decision making that would result, and instead attempts to utilize a single incident commander.



**The result of this patchwork approach is a lack of accountability and clear command structures that leads to failed or inadequate response practices and procedures that put the life-safety of passengers and employees at avoidable risk.**

This is demonstrated by Metrorail's transfer of command during incidents when the fire department is designated as incident command and controlling the scene, and by Metrorail's understanding that the fire department is in charge of a scene as specified by fire department processes requiring a single incident commander when a fire department is called to respond to a smoke or fire event. In addition to the designation of a fire department incident commander, that incident commander eventually turns over incident command to an MTPD official as specified for a situation where a single incident commander is used, not a situation where a unified command is used. Metrorail's Emergency Operations Plan includes a statement that the "on-scene commander" (OSC) is in charge of WMATA resources, and an incident commander is in charge of public safety response resources. This concept could be the case in a true unified command, but, as described below and by regional first responders, Metrorail does not consistently carry out the command structure that its procedures specify. The result of this patchwork approach is a lack of accountability and clear command structures that leads to failed or inadequate response practices and procedures that put the life-safety of passengers and employees at avoidable risk.

Interviews for this audit identified confusion among frontline MTPD officers and other Metrorail personnel about their roles and responsibilities during emergencies, including how different Metrorail departments are required to coordinate. One supervisor in an operations department who has responded to emergencies was not aware of the required coordination to provide information to the incident commander, of NIMS/ICS, or of the requirement that the incident commander – not an operational supervisor serving as a liaison – make decisions related to things like third rail power being energized or de-energized. Instead, the supervisor believed that they or the Maintenance Operations Control (MOC) could make those decisions.



When a fire department is called to respond to fire or smoke, the fire department is now generally treated as having responsibility for incident command; however, as demonstrated by the October 2020 train pull-apart near Union Station (W 0079) and the March 2021 event leading up to a runaway train near Rhode Island Ave-Brentwood Station (W 0116), this responsibility is not clearly understood or communicated during events that do not immediately require fire department intervention. In events such as those in which WMATA personnel maintain incident command, this leads to communication and decision making that is disorganized and distributed rather than formalized and centralized at an incident command post.

In the October 2020 pull-apart near Union Station there was confusion regarding Metrorail's lack of incident command, and the fire department established incident command on a roadway overpass overlooking the train. Not all Metrorail personnel reported to that incident command post in a timely manner, which reduced the effectiveness and speed of the response.

Fire department and MTPD personnel stated that there are continuing challenges in ensuring that all Metrorail personnel report to the incident command post or staging area as required prior to taking any action on scene. This was particularly notable during the response to the July 7, 2020 derailment outside Silver Spring Station (W-0081) in which many personnel crowded the platform and did not report to the command post or staging area.

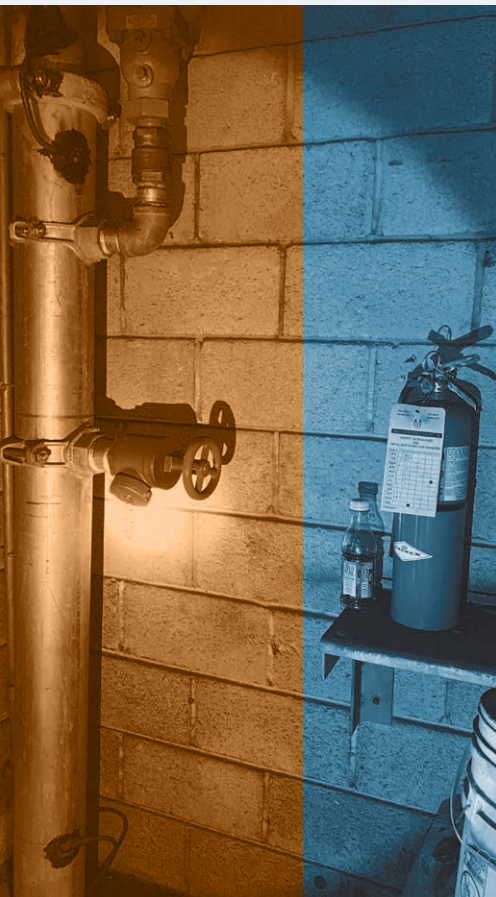
MTPD has also not properly integrated into incident command as required in other situations, including a suspicious package investigation triggering an evacuation of Capitol South Station on May 13, 2021 that was led by U.S. Capitol Police (W-0013). Not coordinating with the incident commander led to confusion about the station's safe operating status.

Proper training is required to prepare personnel to respond to and/or manage emergencies within the NIMS/ICS framework. For example, serving as an effective incident commander requires specific skills and training and each individual who may be required to serve in that role must be trained and prepared; however, Metrorail does not currently provide adequate training to all personnel WMATA may designate as "on-scene commander."

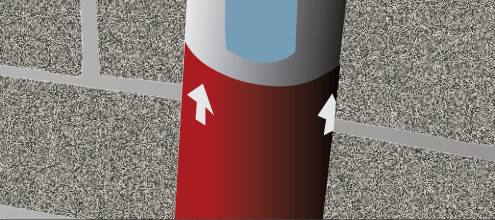
Metrorail's PTASP states that all frontline employees are to be provided training on NIMS through the NIMS-700 online course, An Introduction to the National Incident Management System, and by further emergency response training provided by the employees' departments. The NIMS Training Program Core Curriculum states that training should be tailored to the types of incidents most likely to occur. IS-700 training is listed as sufficient only for low complexity, Type 5 events, which are defined as contained incidents that can be handled with one or two single resources with up to six personnel. Type 3 and Type 4 events, which require additional resources and occur regularly in the Metrorail system, require additional training such as the ICS-100, ICS-200 and IS-800 courses.

Metrorail's training requirements, including a list of job titles requiring NIMS and ICS training, are insufficient relative to the roles, responsibilities and involvement of Metrorail personnel within the ICS structure. This includes positions that WMATA currently designates as on-scene commander, forward liaison, incident management official (IMO), and Rail 1 and 2, as well as anyone else from any department that may be enlisted into the process or deployed to the command post.

The ICS structure also applies during emergencies that do not require external agency response. Emergency events include more than just those events where an external







**Regardless of whether external agencies are involved in an emergency response, it is critical that both MTPD personnel and other Metrorail staff operate from a shared understanding and common procedures; however, this is not currently the case.**

first responder agency such as a fire department is called, and all events involving more than a brief disruption should be handled through a scalable application of ICS.

In an example of the importance of ICS even when external agencies are not responding, during flooding following heavy rainstorms at Dunn Loring Station on July 1-2, 2021, no individual took full control of the response to specify priorities and direct resources on scene. Instead, some personnel attempted to clear a substantial amount of water off the floor of an electrical room after they had been told that power had been reconnected, while other personnel were attempting to do other work in the same space rather than focusing on removing water from a room with electrical equipment and cabling. Separate departments in the flooded area worked toward separate goals. There was no Metrorail incident commander establishing priorities, for example, to work together first to address the flooding issue and then the power issue. Frontline personnel involved in the response also stated they were not aware of, and had not been a part of, any post-event debriefs for this or any other similar emergencies.



Regardless of whether external agencies are involved in an emergency response, it is critical that both MTPD personnel and other Metrorail staff operate from a shared understanding and common procedures; however, this is not currently the case. For example, WMATA personnel in departments other than MTPD indicated that they believe that “Transit (Police) doesn’t understand the railroad,” suggesting that MTPD decisions can be second guessed or even overridden by non-MTPD personnel despite Metrorail procedures assigning MTPD personnel as incident commander in emergencies where Metrorail maintains responsibility for incident command. In fact, one MTPD officer interviewed for this audit stated that they had never heard of SOP 1A and that they do not use that; however, this is Metrorail’s SOP governing command, control and coordination of emergencies that specifies the incident response process, including MTPD responsibilities.

Contributing to this issue is limited training for MTPD officers on the rail system and rail emergencies, and a lack of shared understanding among MTPD officers and supervision of how to respond to emergencies. For example, although a ranking MTPD official stated officers would now definitely respond to a stranded train between stations to help the train operator keep control and calm passengers (following the



2

**This IMO was installed in the ROCC without any specific procedures, specified responsibilities, procedural updates to reflect this position, or any other documentation.**

two 6000 Series train pull-aparts in fall 2020), an experienced officer said that they would never do that and would remain at the station platform. MTPD personnel similarly did not respond to a disabled train in a timely fashion near Rhode Island Ave-Brentwood Station on March 26, 2021, which contributed to customer self-evacuations.

SAFE leadership stated they may eventually rename SOP 1A as an incident management framework but are continuing to revise SOP 1A in the meantime, pending development of better communication of individual roles, better training, and better exercises. WMATA must ensure that all WMATA personnel involved in emergency response and emergency management – whether MTPD or not – share a common knowledge of the rail system and are working from common emergency procedures. This calls for both revising and unifying procedures and developing and delivering improved training.

**Minimum Corrective Action:** WMATA must develop and implement unified, Metrorail-wide procedures that comply with NIMS and ICS to provide for the safe and efficient resolution of incidents and emergencies, and ensure that these procedures apply and are used for all emergencies, regardless of whether external agencies are involved in an emergency response. Metrorail must provide adequate and ongoing training for all personnel who may act as incident commander or in another role in the unified command on the necessary skills to carry out those roles. Metrorail must review, update and provide training to all personnel on NIMS and ICS principles and requirements, and ensure adequate safety promotion efforts are in place to make the changes necessary to become NIMS compliant as an organization that responds to and manages emergencies in a coordinated and unified fashion.

**Metrorail created and implemented an “Incident Management Official” (IMO) position without documented training, responsibilities, communication or coordination, and without adequate staffing to ensure other emergency management and preparedness activities were not interrupted.**

Metrorail created and implemented an “Incident Management Official” (IMO) position in the Rail Operations Control Center in April 2021 following a March 26, 2021 runaway train event near Rhode Island Ave-Brentwood Station. This event involved customers stranded on a disabled train for an extended period, self-evacuations, delayed MTPD response to the train, and later a runaway train during the rescue train process that was only identified and reported due to independent WMSC oversight and investigation.

This IMO was installed in the ROCC without any specific procedures, specified responsibilities, procedural updates to reflect this position, or any other documentation. Personnel working as or with IMOs did not receive specific training



**Frontline personnel stated that they “didn’t have a clear understanding when we implemented the IMO.”**



or procedures. The creation of this position also led to the suspension of some training that had been provided by the Office of Emergency Management (OEM) when Metrorail diverted the OEM personnel who had been providing the training to jurisdictional fire departments and other responders to instead staff the new position. The IMO was introduced without any hazard analysis or similar considerations. Even during this audit, after several months of having this position, various Metrorail and jurisdictional first responder personnel had conflicting understandings of the IMO’s role. This includes differences in understanding of the position among people who are working in the role, among those who created the role, and among those who interact with the IMO on a regular basis.

Frontline personnel stated that they “didn’t have a clear understanding when we implemented the IMO.”

These differences in understanding included:

- Overall confusion about the role of the IMO and the expectations for other Metrorail employees and jurisdictional responders related to interactions with the IMO.
- Statements from leadership that the IMO was to be a safety representative in the ROCC performing in an oversight role who is not involved in the emergency response process; however, in practice, the IMO has been directly involved in incident response and there were earlier descriptions of the IMO having incident management responsibilities (which were outside of the ICS process).
- Statements that the IMO is not to be involved directly in emergency communications; however, the IMO is serving as the direct liaison to the ROCC from MTPD, and some MTPD personnel described the IMO as functioning exactly like former OEM liaisons who were present in the ROCC during rush hours.
- Statements that the IMO was meant to continue momentum toward improvement in the ROCC; however, there is no process in place for an IMO to report positive or negative practices and no requirement that each IMO be fully trained on ROCC procedures.
- Statements that the IMO would be involved in deciding what troubleshooting may be conducted, for example, on a stranded train, despite personnel serving as IMOs not being trained for those decisions and IMOs not being included in Metrorail’s written procedures.
- MTPD personnel also expressed confusion about the IMO role, and stated that there is conflicting information provided during emergencies from the IMO, Rail Operations Information Center (ROIC) and the Security Operations Control Center’s (SOCC) interactions with rail controllers.

**SAFE leadership could not explain why development of procedures, expectations, training and adequate staffing was not done before the IMO position was implemented.**

SAFE leadership could not explain why development of procedures, expectations, training and adequate staffing was not done before the IMO position was implemented.

In response to a draft of this report, Metrorail acknowledged that “trainings and roles/responsibilities were defined as the role evolved.”

The disorganized implementation of the position has resulted in further confusion and inefficiencies which do not have the additive safety benefit Metrorail apparently intended.

After the on-site portion of this audit had concluded, and after the WMSC had outlined these safety concerns in the exit conference and in follow up conversations requested by WMATA, Metrorail provided draft “guidelines” for what they would now call the Mission Assurance Coordinator (MAC) rather than the IMO. These guidelines were limited, did not address all personnel who would need to work with this IMO/MAC position (such as MTPD officers, the ROCC Fire Liaison, and ROCC personnel), did not incorporate any changes into procedures, specified that the individual would be involved in the incidents, stated that the MAC would serve as both an MTPD liaison and SAFE liaison, and did not describe specific training required to carry out each duty.

The nature of the creation of this IMO position also led to shortfalls in training, including in-service training for local fire departments, because personnel who had been conducting the training were shifted to carry out the IMO role. According to multiple people interviewed for this audit, this led to Metrorail falling short of fulfilling all training requests, which limits firefighters’ preparedness to enter the roadway, ancillary rooms at stations, and vent shafts. At the time of this audit, Metrorail was attempting to restructure elements of the Safety Department, including those elements brought in from OEM in spring 2021, and was in the process of hiring for positions that would serve part time as IMOs or MACs and part time in training or other roles. SAFE leadership was not initially aware of the scale of the training being provided by OEM before Metrorail shifted those responsibilities to SAFE in spring 2021, and was hopeful the open positions would be filled by early 2022.

**Minimum Corrective Action:** Metrorail must define the roles, responsibilities, authorities, and tasks of each position in the emergency management and fire and life safety process, including (if it or a successor position continues to exist) the IMO/MAC. This must include clear definitions of what each role does and how those duties that are incorporated into each relevant procedure are accomplished, associated training requirements and curricula. Each person performing in those roles must be fully trained and qualified to serve in that capacity, and each person who may





interact with those individuals must be trained on their own role, responsibility and authority. Metrorail must clearly communicate these responsibilities and authorities to all individuals who may fall under the incident command system.

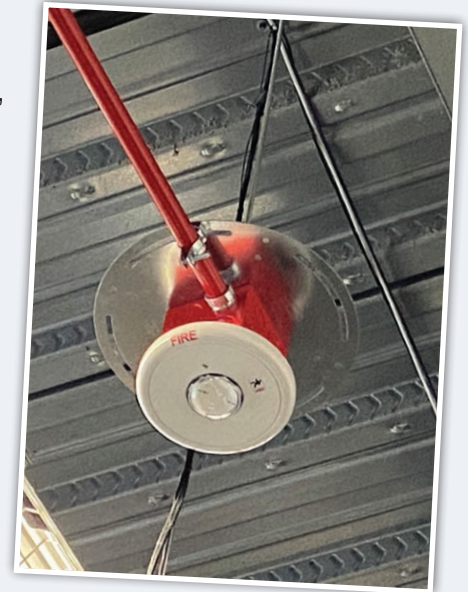
**MTPD personnel routinely enter the roadway despite not having RWP qualifications required by Metrorail rules and procedures, exposing themselves and others to the risk of serious injury or death.**

Metrorail's first "Cardinal Rule"<sup>1</sup> of Roadway Worker Protection (RWP) is that "All personnel, regardless of rank or title, shall be RWP trained and qualified before entering the Authority's Roadway." However, Metro Transit Police Department (MTPD) personnel routinely enter the roadway despite not being qualified at any RWP level.

Accessing the roadway without proper safety protections and knowledge can lead to death or serious injury due to rail system hazards such as moving vehicles, energized third rail and associated equipment, and specialized equipment such as moving switches. An RWP program is designed to ensure that personnel are aware of roadway hazards and qualified to protect themselves and others.

Records provided by MTPD showed that of the hundreds of MTPD personnel, only 19 individuals have current RWP qualifications. Those 19 included some OEM personnel, some security personnel, and some video evidence technicians. Because MTPD personnel do not receive RWP training, they may not be prepared to properly protect themselves and others when performing their duties on the roadway, which could lead to serious injury or death.

MTPD officers observe some roadway tours and demonstrations of hot sticks and warning strobe and alarm devices (WSADs) as part of initial training and annual in-service training, but they are not taking classes and being qualified as RWP Level I, II or IV – the only qualifications that exist in Metrorail's RWP program. Based on interviews and a review of selected training records, it appears that MTPD personnel formerly received RWP training; however, that is no longer occurring. Individual training records sampled for this audit showed the qualification was intermittent, with some documented qualifications expiring for years followed by a new qualification, and even instances in which RWP qualification was revoked, but re-testing was dropped.



<sup>1</sup> "Cardinal Rules" are rules Metrorail deems of such importance to safety that noncompliance can lead to discipline including termination because violations of these rules can result in serious or catastrophic damage to property or serious or catastrophic injury or death of individuals (Metrorail Safety Rules and Procedures Handbook Section 5.2).

**The only MTPD individual that Metrorail provided documentation for as having the Level IV RWP qualification required to establish a work zone under Metrorail rules and procedures was the OEM Director.**

A review of the Mandatory In-Service Retraining (MIR) that MTPD stated served as the training for MTPD personnel demonstrated that the RWP-related training is significantly less than the training required of other Metrorail employees performing normal duties on the roadway and less than the training required for those personnel overseeing the safety of other RWP-qualified individuals on the roadway.



Metrorail requires RWP training for anyone entering the roadway, including employees or contractors who only briefly access the tracks or who pick up trash, making it clear that sufficient training and understanding is required for police officers who enter the roadway and who are responsible for taking charge in an emergency and directing riders to safety.

As demonstrated by interviews during this audit and multiple safety event investigations described above, MTPD personnel also are not all familiar with or do not follow Metrorail's standard operating procedures, despite the audit interviews confirming that these operating and safety procedures, such as RWP and SOP 1A, apply to all Metrorail employees.

Beyond the immediate safety risks for MTPD personnel, customers and others, MTPD's unfamiliarity with roadway procedures and lack of RWP qualification also leads to confusion and disputes during emergency response about the process of ensuring third-rail power is de-energized and what permissions the Rail Operations Control Center (ROCC) can provide.

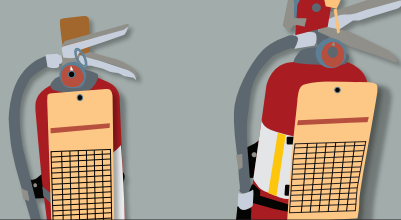
For example, as documented in investigation W-0084 of a December 13, 2020 customer evacuation from trains on the Green and Yellow Lines, MTPD personnel took customers onto the roadway without proper safety equipment in place despite the correct, safety-based objections of fire department personnel.

MTPD leadership also stated that crime scene technicians had RWP training required to set up their own work zone; however, the only MTPD individual that Metrorail provided documentation for as having the Level IV RWP qualification required to establish a work zone under Metrorail rules and procedures was the OEM Director.

**Minimum Corrective Action:** Metrorail must determine the appropriate level of RWP training and qualification for all MTPD personnel who may enter the roadway and ensure that those personnel receive and maintain that training and qualification required to ensure the safety of passengers, workers and first responders. Metrorail must also ensure that these personnel are appropriately trained on any other aspects of the emergency environment and procedures that they may need to carry out as part of their critical life-safety activities.







4

**Many MTPD general orders have not been updated since before the fatal 2015 smoke accident near L'Enfant Plaza Station, and do not reflect current rail operations procedures or other fire and life safety and emergency management lessons learned.**

**MTPD general orders do not reflect current operational realities and procedures, and areas for improvement from prior events are not effectively communicated to frontline MTPD personnel.**

Many MTPD general orders have not been updated since before the fatal 2015 smoke accident near L'Enfant Plaza Station, and do not reflect current rail operations procedures or other fire and life safety and emergency management lessons learned since those orders were signed in 2011, 2012 and 2013.

Metrorail has made substantial changes to its operations during that time, including to rail operating rules and procedures, operational department assignments, and the roadway worker protection program; however, these changes are not reflected in many MTPD general orders.

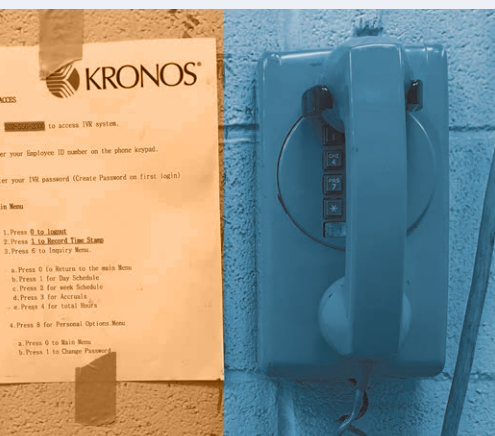
The general orders include a statement of compliance with NIMS and ICS, but they reference an “on-scene commander,” which, as noted in Finding 1, is not compliant with NIMS and ICS. The orders also describe a fire-rescue incident commander when there is in fact only one incident commander under ICS.

Directions are also not clearly understood. Various MTPD personnel interviewed for this audit had different understandings of how to respond to safety events or other emergencies.

MTPD officers also stated that they do not get the full benefit of lessons learned after safety events or other emergencies. Although sergeants hold debriefs about the events, lessons learned or areas for improvement do not always reach MTPD officers. These lessons are particularly important because some officers may only happen to play critical roles such as incident commander in Metrorail safety event response a few times per year or even less frequently.

MTPD after action reports from safety events similarly do not consistently lead to substantive improvements. For example, an after action-review of an event at Tenleytown discussed the importance of ICS compliance and training, yet this area of concern remains unresolved. There is no clear compilation of these lessons learned conveyed to frontline personnel to ensure that the lessons reach all MTPD personnel or that the lessons are incorporated into future training. The status of several items identified as opportunities for improvement was also listed as “completed” in after action logs, even though they had not been implemented. There is no documented practice to evaluate these improvements for their effectiveness.





5

**The lack of a 911 call script and related training regularly leads to calls that are protracted, are not conducted in plain language that is understandable to the call taker and first responders, and that do not lead to the appropriate response in a timely fashion.**

**Minimum Corrective Action:** Metrorail must review and update MTPD general orders to reflect current best practices for safety and to reflect current operational realities, rules and procedures, and provide training on each revision to ensure personnel have a clear and complete understanding of how to properly implement these processes. Metrorail must ensure that MTPD orders and procedures are regularly reviewed against the rules and procedures of other operational departments. Metrorail must also establish a process to compile and implement lessons learned from after action reports and incident debriefs and ensure that the information is clearly communicated to and understood by all MTPD and other Metrorail personnel and to ensure that they are incorporated into training and procedures. Metrorail must establish a documented process to evaluate the implemented improvements for effectiveness.

### **Metrorail's calls to public safety answering points (911 call centers) are inconsistent, incomplete and contribute to delayed or ineffective emergency response.**

Metrorail does not have an effective, standardized script, instruction or other guidance to ensure that calls to public safety answering points (911 dispatch centers) are clear, concise and lead to appropriate and timely emergency response.

The lack of a 911 call script and related training regularly leads to calls that are protracted, are not conducted in plain language that is understandable to the call taker and first responders, and that do not lead to the appropriate response in a timely fashion.

The use of WMATA-specific terms such as "ROCC," "jumper" (which Metrorail uses even in Maximo to refer to a person struck by a train), "roadway", or "chain marker," (location identifiers similar to highway mileposts along the roadway) as well as not always clearly differentiating between events that occur in stations or between stations, make it more difficult for dispatchers to send the appropriate response.

Providing clear direction, instructions, and supervisory oversight to ensure that 911 calls are placed in a timely manner, and that they follow a clear and concise script free of Metrorail-specific jargon, would improve emergency response and fire and life safety. Likewise, ensuring that all relevant personnel in the ROCC (e.g., cognizant operations desk, fire liaison, ROIC) and in the system (e.g., relevant station manager) are aware when a 911 call has been placed by Metrorail personnel would also improve emergency management and response.

Training on the script and associated improvements could also improve response by improving the quality of the information provided to local first responders so that the responders have as clear and accurate a picture of the situation as possible as they are dispatched and responding so that they can send the most appropriate response assets to the optimal location(s).





To improve these calls and the timeliness and completeness of emergency response, Metrorail's script should state that the call is being made by a Metrorail employee in a specific facility. Key aspects of the communications include the location, the event, the number of known injuries, and any ongoing hazards.

For example, the 911 call made during the response to a November 2020 train pull-apart near Glenmont Station (W-0080) did not include clear information about the location of the event and basic information about what had occurred. The call was protracted, and never included a clear communication that the call was coming from a Metrorail official. The call also included references to the "roadway" which were confusing to the call taker, and did not clearly communicate that the event was close to the station platform.

The March 2021 event near Rhode Island Ave-Brentwood Station did not lead to a 911 call from Metrorail, was later reported as a minor medical issue, then ended up with the fire department responding for a potential train evacuation on an elevated structure.

The October 2021 train pull-apart near Union Station demonstrated similar challenges, with the fire department responding based on Metrorail's report of an emergency, but with no specific information regarding the nature of the assistance needed.

In summer 2021, Metrorail took steps to meet with D.C.'s Office of Unified Communications (OUC) to restore a special direct line for the ROCC to use to contact OUC.

In late summer 2021, changes in the ROCC included changes to the personnel who are assigned to make 911 calls from the ROCC. Although most 911 calls previously came from the ROIC or an assistant superintendent, each sub-department within the ROCC is now directed to call 911 if they received the information leading to the call.

**Minimum Corrective Action:** Metrorail must, in consultation with 911 call centers and first responders in the region, develop a script for Metrorail 911 calls to guide personnel to clear and concise reporting in an effective manner understandable to 911 call takers, and a process to ensure that other relevant personnel are notified when the call is completed. Metrorail must establish initial and recurring training on this script and associated procedures, and must specify the personnel who are required to receive this training.

**Metrorail has not clearly defined and communicated the authority and duties of its Fire Marshal and any other fire prevention roles or positions, and does not have effective continuity plans in the event the Fire Marshal is unavailable.**





**The project team and safety certification team stated that they installed the combustible materials, contrary to NFPA 130 requirements and the Fire Marshal's instructions, in part because the Fire Marshal was on vacation.**

Metrorail does not clearly define and communicate the role, responsibilities, and authority of what appears to be its fire prevention entity, the Fire Marshal's Office. Metrorail also has not implemented and communicated a continuity of operations plan for when the Fire Marshal is unavailable.

For example, in relation to the Tunnel Ventilation Pilot Project, project staff and Metrorail's safety certification team stated that they installed a hazard – combustible wooden stairs in the tunnel despite the Fire Marshal's instructions that the stairs at minimum had to be made of fire treated wood. The project team and safety certification team stated that they installed the combustible materials, contrary to NFPA 130 requirements and the Fire Marshal's instructions, in part because the Fire Marshal was on vacation when they encountered difficulty acquiring the specified materials, and they did not find it necessary to contact anyone else for guidance.

The lack of defined fire prevention responsibilities contributes to inconsistent coordination with jurisdictions, including with the AHJs, the jurisdictional authorities having jurisdiction responsible for the fire code and standards. Metrorail's maze of acronyms, organizational units, and overlapping job titles creates challenges and confusion for external agencies, including the AHJs, that is compounded when different staff members make multiple similar communications to the same external group.

This prevents information from external sources from reaching all necessary points within the Metrorail organization, because Metrorail does not have adequate internal processes to ensure safety issues identified by fire department inspections lead to the appropriate work orders or other internal action (see Findings 6, 8).

Metrorail has not provided a standardized structure or an email distribution list for fire departments to provide inspection or other safety issues to WMATA through the Metrorail Fire Marshal's Office to ensure that these safety issues are processed, addressed and result in a response to the reporting entity.

For example, spreadsheets of inspection information from Montgomery County Fire and Rescue Services and the Arlington County Fire Department, as well as similar reports from D.C. Fire and Emergency Medical Services demonstrate that items identified in early 2021 had still not been addressed in mid-2021. Metrorail also did not know whether or not other local fire departments conduct similar inspections, demonstrating that Metrorail does not have an understanding of who, if anyone, conducts inspections of the fire and life safety systems and characteristics within the Metrorail system.

The WMATA Fire Marshal's Office understands one of its responsibilities to be identifying areas to correct so that the AHJs do not need to enforce violations at WMATA.





**Metrorail initiated a long-planned Red Line Tunnel Ventilation Pilot Project without appropriate consultation and review by its fire and life safety experts and without completing a hazard analysis, which led to the introduction of unacceptable hazards into the Metrorail system.**

7



The Fire Marshal was also recently assigned to lead incident response debriefs for major emergency responses that have been requested by the WMSC and implemented by SAFE. However, the outcomes of these debriefs are not always clearly communicated to all relevant internal Metrorail departments or Metrorail's investigations team to ensure that identified improvements are implemented to improve response in the future.

This could be improved, in part, by clearly defining and communicating the authority and duties of the Fire Marshal with respect to fire prevention activities, code compliance efforts, ensuring that fire and life safety equipment is in a state of good repair and ready for use in an emergency. The NFPA regards a Fire Marshal as an official who has responsibility and authority for setting, interpreting and enforcing fire and life safety standards and practices, for leading efforts to inspect and ensure compliance, and investigating and implementing lessons learned from relevant safety events. Formalizing the Fire Marshal's duties to include the integrated inspection process described above could help coordinate fire prevention activities and inspections and ensure that these activities result in improved fire and life safety.

**Minimum Corrective Action:** Metrorail must clearly define and communicate the authority and duties of the Fire Marshal and the role of the Fire Marshal's Office to ensure that fire and life safety issues are properly identified and addressed in a timely fashion. This must include formally documenting, implementing, tracking and verifying the resolution of relevant areas for improvement identified in inspections, debriefs or other activities and the associated corrective actions to address each area for improvement. Metrorail must designate, communicate and ensure the availability of any appropriate backup personnel for the Fire Marshal when the Fire Marshal is not available.

**Metrorail does not ensure that experts in fire and life safety are included in and have a documented role in Metrorail project development, planning, review and approvals, which contributes to hazards being introduced into the Metrorail system or hazards being allowed to continue to exist without adequate mitigation.**

Metrorail initiated a long-planned Red Line Tunnel Ventilation Pilot Project without appropriate consultation and review by its fire and life safety experts and without completing a hazard analysis, which led to the introduction of unacceptable hazards into the Metrorail system. The WMSC identified hazards including restricted emergency egress paths during an August 4, 2021 site visit for this audit, and communicated these safety issues immediately on-site as well as in additional follow-up conversations based on additional document review.

As part of a rush to respond to the WMSC's initial communication of these hazards to Metrorail, WMATA created additional unacceptable hazards by, contrary to

**The obstructed egress could have been avoided or mitigated in the first place had Metrorail followed its own safety certification requirements specified in its Safety and Security Certification Program Plan (SSCPP) and its other project review and approval requirements.**

National Fire Protection Association (NFPA) 130 (Standard for Rail Fixed Guideway Transit and Passenger Rail Systems), introducing flammable material into the tunnel environment by placing wooden stairs to temporarily resolve the initial egress issue identified during site visits for this audit.



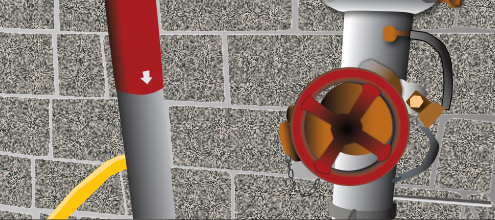
The WMSC identified this subsequent violation of NFPA 130, and directed Metrorail to remove the untreated wooden stairs, to expedite the construction of permanent concrete or steel stairs that had been removed from final designs despite being in initial drawings created prior to the project award to a contractor, and to ensure that trained Metrorail personnel are present in the area to assist with an evacuation if needed until an adequate egress path is restored. During follow-up discussions on this issue, Metrorail stated that they had sought steel stairs as an immediate temporary mitigation after the WMSC identified and communicated the obstructed egress issue, but they could not procure them within days, so the WMATA Fire Marshal suggested a possible alternative of fire-treated wood. When WMATA could not immediately procure fire-treated wood, project management and safety certification personnel said that they took it upon themselves to decide to install regular wood stairs with a plan to add fire resistant paint several weeks later. The Fire Marshal was not consulted. No other fire and life safety experts, nor the Authority Having Jurisdiction (AHJ) were consulted either, demonstrating continued siloing within the Metrorail organization.

The obstructed egress could have been avoided or mitigated in the first place had Metrorail followed its own safety certification requirements specified in its Safety and Security Certification Program Plan (SSCPP) and its other project review and approval requirements. This project was one of several instances across various aspects of Metrorail where the WMSC identified that Metrorail was not following its own procedures, which led the WMSC to issue a finding requiring a corrective action plan on August 13, 2021 specifically related to Metrorail's compliance with its safety certification procedures.

This project was created explicitly to address fire and life safety and emergency management issues in tunnels highlighted by the fatal 2015 smoke accident near L'Enfant Plaza Station and FTA SMI report, yet the project did not undergo adequate review and approvals by Metrorail's fire and life safety experts that could have identified safety issues related to vertical beams being installed in a way that obstructs egress.

Metrorail personnel stated that the project team was told to speed up the timeline for construction on this project. This contributed to significant portions of construction occurring before substantial design aspects were reviewed and approved. Replacement emergency stairs with clear egress paths that had been part of the 30 percent designs were then not included in the actual construction plans, and were only restored after the WMSC's observations, communication and direction.





**Inspections and maintenance of fire and life safety and emergency management assets are not consistently coordinated across multiple departments.**

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This demonstrates the importance of the continuous involvement of subject matter experts from project initiation through any contract awards all the way through to completion, implementation and review of any mitigations that were implemented throughout the process.

During interviews conducted for this audit, the WMSC learned of another example of a project that required changes at the last minute due to insufficient internal coordination and review. Work that includes a new entrance at the Medical Center Station had to be adjusted when Metrorail personnel realized that issues with the existing fire alarm system needed to be addressed as part of the project that was adding new fire alarm infrastructure. Personnel interviewed for this audit also described similar late reviews and adjustments have occurred in relation to the initial platform renovation project and in relation to aspects of Purple Line construction that interact with the Metrorail system.

The safety issues with these projects are of particular concern because they are the types of projects that Metrorail personnel interviewed for this audit stated gets the most scrutiny and review for fire and life safety issues: new construction or planned changes. There is little review by Metrorail's fire and life safety experts on an ongoing basis of whether substantive rehabilitation, renovation or replacement projects or changes are needed.

**Minimum Corrective Action:** Metrorail must implement processes to ensure that fire and life safety and emergency management experts with appropriate skills and experience are included in, and have a documented role in project identification, and in the development, planning, review and approvals of each project from project development and implementation through project completion.

**There is inadequate coordination among organizational units charged with developing, inspecting and maintaining critical fire and life safety assets, and there is no unified process to identify, prioritize and address fire and life safety risks.**

In a positive step, the Fire Marshal's Office has recently begun recurring meetings to ensure that appropriate organizational units address safety issues identified by the Fire Marshal's Office own inspections. However, inspections and maintenance of fire and life safety and emergency management assets are not consistently coordinated across multiple departments, and there is no unified way for Metrorail to identify, prioritize and address fire and life safety and emergency management risks.

There is no formal, integrated, holistic process for inspecting fire and life safety and emergency management assets and ensuring that identified deficiencies are addressed. For example, Emergency Trip Station (ETS) boxes are separately inspected by at least three different departments, none of which conducts these inspections together. Although Metrorail tags ETS boxes that are out of service, different organizational units use different tags that are not clearly understood by personnel in

**The safety gaps identified in this audit include Metrorail not coordinating to receive and address problems identified by other departments or entities such as those issues identified through in-service inspections by local fire departments.**

the field who may need to use the boxes in an emergency. Some elements of the inspections are captured and reported through Maximo work orders, however that does not effectively prioritize repairs to prevent and mitigate safety issues. For example, several people interviewed for this audit stated that they are sometimes directed to repair a lower-risk issue first because it has been open longer than a higher-risk issue. Even then, work is made more difficult for some frontline employees because they are not trained on how to easily gather work history related to an item that they are repairing to help determine the cause or best course of action.

The safety gaps identified in this audit include Metrorail not coordinating to receive and address problems identified by other departments or entities such as those issues identified through in-service inspections by local fire departments. Documents reviewed for this audit demonstrated that fire departments had identified and transmitted to WMATA representatives safety deficiencies with medical equipment cabinets as recently as winter 2021. However, when the WMSC raised these same issues to departmental leadership during site visits for this audit in summer 2021, Metrorail personnel were unaware of the deficiencies and no action had been taken to address the issues (see Findings 6, 10). Metrorail has not designated a point of contact for these inspections, which contributes to the inspections being sent outside the chain of command and to the potential for missing or duplicative work orders and limited response back to the fire departments on any issue resolution. Relatedly, multiple individuals at Metrorail have separately reached out to jurisdictions and AHJs in an uncoordinated fashion on the same issue or question.

Confusion on this front includes disparate job assignments for personnel with similar titles, such as various fire safety officers or liaisons that appear in multiple parts of the SAFE organizational chart without clear definition of emergency management, preparedness and response responsibilities. SAFE was attempting to adjust this organizational chart at the time of this audit as SAFE leadership learned more about OEM's responsibilities in the months after SAFE took responsibility from MTPD for most of OEM. Confusion remained among Metrorail and external personnel about the role of the OEM Director who remained with MTPD and who was continuing to serve as a point of contact for local first responders. Other communications were being sent to jurisdictions on behalf of lower-level personnel in SAFE.

Coordination among Metrorail organizational units would increase the efficiency and effectiveness of inspections, repairs, code enforcement and resolution. Without careful tracking and hazard and risk identification and assessment, Metrorail cannot







**Even when risks are identified, they may not be shared broadly within Metrorail, and they do not get incorporated into broader system-wide hazard identification, safety risk management or other processes, despite this coordination and communication being fundamental to SMS and Metrorail's PTASP.**

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effectively prioritize and assign resources to mitigate hazards as required under the Safety Management System (SMS) approach specified in Metrorail's PTASP.

Several fire and life safety experts in multiple departments interviewed for this audit stated that they work together when particular projects arise, but that there is no formalized recurring coordination among these critical positions. This creates a risk that Metrorail is relying on these individuals, rather than structured processes that ensure that any other staff placed into these positions will be included in necessary discussions and reviews. This also risks the loss of institutional knowledge about, for example, the reasoning for or existence of specific safety mitigations. Without such knowledge, future personnel cannot make fully informed decisions.

Establishing this SMS approach requires structured coordination and collaboration across departments on the development of integrated procedures, schedules and responsibilities. This can also provide a check to ensure that any deferral of inspection or repair is appropriately considered and reviewed on a regular basis, and to ensure that essential fire and life safety and emergency management assets are repaired in the most timely fashion.

**Minimum Corrective Action:** Metrorail must develop and implement a formal, integrated process for the inspection, maintenance and repair of fire and life safety and emergency management assets, including the process to receive, document and address safety issues identified by external entities such as jurisdictional fire departments and AHJs. Metrorail must provide adequate training on these processes, including the requirements for how frontline employees are to gather, access and communicate information that is necessary to carry out the integrated inspection, maintenance and repair process. Metrorail must specify responsibilities, roles and required coordination for each position and department with responsibilities related to fire and life safety and emergency management and preparedness.

**Metrorail does not routinely conduct hazard assessments to evaluate and prioritize fire and life safety and emergency management issues. Further, Metrorail has not established a fire and life safety and emergency management hazard identification, tracking and open item resolution process for prioritizing and implementing safety improvements.**

Metrorail does not use any formal process to assess and prioritize fire and life safety and emergency management hazards. In conjunction with the siloed nature of Metrorail's departments and operations, this limits Metrorail's ability to mitigate fire and life safety hazards.

Even when risks are identified, they may not be shared broadly within Metrorail, and they do not get incorporated into broader system-wide hazard identification, safety risk management or other processes, despite this coordination and communication being fundamental to SMS and Metrorail's PTASP. For example, Metrorail has not

**Under an SMS approach, not only do corrective actions addressing hazards, risks or investigation outcomes need to be implemented, but the effectiveness of these mitigations also need to be monitored on an ongoing basis.**

systematically assessed and addressed hazards and risks of water intrusion to ensure the system is adequately prepared for and acts to prevent fire and life safety emergencies. Metrorail provided a flood plan for this audit that multiple leaders were not familiar with that focused heavily on river flooding but did not address Metrorail's long-term issue with water intrusion into tunnels that contributes to electrical arcing, infrastructure deterioration and other hazards.

Under an SMS approach, not only do corrective actions addressing hazards, risks or investigation outcomes need to be implemented, but the effectiveness of these mitigations also needs to be monitored on an ongoing basis to ensure that the implementation is working and that resources are allocated in the most effective manner to maintain the safest practicable system. This means that Metrorail as a whole, not only individual departments, must focus on the general needs of the agency rather than just individual defects. To do that, there must be documented processes of communication among departments and tracking of the effectiveness of mitigations and repairs.

Multiple Metrorail inspection reports reviewed for this audit indicate safety issues, but do not include any follow up to ensure that the issues are addressed. For example, a communications inspection of Federal Triangle Station lists a smoke alarm condition as "device in trouble," but does not reference any action taken to address that trouble condition. Other inspection reports include items marked as not passing, but do not include information on what needs to be done to address an issue. Some inspection reports identified debris impeding egress and signage issues, but the findings were not used to identify the frequency or recurrence of these issues to determine whether construction or other work might be causing the issues and whether mitigations are possible to prevent the problem in the first place.

Inspections of tunnel walkways, exhaust fans and vent shafts identified structural or functional concerns such as cracks in concrete, rusted ladders, or bypassed or non-functioning fan dampers, but those concerns were not incorporated into a process to assess the risk of these issues, to ensure that issues are appropriately communicated to those with emergency response roles such as the ROCC, and to determine whether additional monitoring or evaluation is required.

Metrorail does have a procedure that specifies the length of time that a fire and life safety work order is open and that requires escalation if a work order has not progressed after 30 days. There are critical fire and life safety systems that require more urgent action if they are out of service, and the procedure does not include prioritization or identification of





**The general lack of hazard identification, assessment, tracking, and resolution contributes to Metrorail's challenges in preventing and mitigating safety events.**



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what may be a temporarily acceptable hazard and what hazards are unacceptable. For example, it may be temporarily acceptable for certain equipment to be out of service under certain circumstances, but an out-of-service tunnel ventilation fan may not be acceptable at all. Without a clear process and accountability for follow up to ensure issues identified are no longer hazards or are appropriately being monitored and mitigated, the SMS process does not exist.



For example, personnel interviewed for this audit expressed safety concerns about steep shafts that have ladders without cages and fall protection harnesses that are not appropriately sized for larger individuals, but stated that hazard reporting structures seem complicated; consequently, an issue like this might not reach appropriate officials because of an assumption that, if it is an issue, the Safety Department will identify it as a hazard.

The general lack of hazard identification, assessment, tracking, and resolution contributes to Metrorail's challenges in preventing and mitigating safety events. Awareness of hazards and risks allows proactive steps to identify, prioritize and mitigate the risk responses and to properly develop and target internal oversight activities.

**Minimum Corrective Action:** Metrorail must establish, communicate and provide training on a process to ensure that all hazards and safety deficiencies identified by external and internal entities are tracked, addressed and reported. Metrorail must conduct regular hazard assessments to prioritize fire and life safety and emergency management issues, and must act on that assessment. The assessments must be conducted on a recurring basis, including current risk assessments, hazard identification, mitigation reviews, trend analysis and other documentation. Metrorail must act on these updated assessments to proactively prevent safety events and mitigate safety risks, including by tracking and resolving open items.

**Emergency equipment in station medical cabinets is expired and covered in dirt. There is no inspection procedure or responsible party assigned to inspect and maintain this safety equipment.**

Site visits for this audit identified that the emergency equipment in Metrorail's station medical cabinets is covered in dirt and has expired at each of the stations examined. This includes bags with bandages, Sked emergency rescue stretchers, and glow sticks that are used to help guide customers out of a dark tunnel in an emergency.





**The glow sticks, for example, had expired in 2019.**

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The glow sticks, for example, had expired in 2019.

The bags for the equipment in medical cabinets are orange, and would be more visible in low-light conditions if they were not covered in dirt. Gaskets on the cabinets do not appear to create the necessary seal to keep out brake dust and other contaminants and keep supplies clean.

Metrorail stated that there is no inspection procedure or assigned party responsible for these cabinets or the equipment inside.

Arlington County Fire Department inspections had identified these issues at multiple stations most recently in January and February 2021 and provided inspection documents to Metrorail that were reviewed as part of this audit; however, the Metrorail fire and life safety personnel who accompanied the WMSC on site visits that found the same issues in August 2021 were unaware of the prior findings (see Findings 6, 8).

“There are currently no known maintenance or emergency management groups who inspect the station medical supply cabinet. No known checklists, inspection forms, procedures, or instructions currently exist,” Metrorail stated in response to WMSC follow up requests.

**Minimum Corrective Action:** Metrorail must develop and implement a procedure to ensure regular, recurring inspections and maintenance of emergency medical cabinets (including gaskets or seals), and of equipment in emergency medical cabinets, and to ensure proactive replacement of expiring materials. Metrorail must assess whether the existing cabinets are fit for their current purpose and must act upon that assessment in accordance with Metrorail’s safety certification and interdepartmental review processes.

**Metrorail does not conduct systematic underground inspections to ensure safe egress and fire and life safety response, and has set minimum tunnel emergency lighting levels that are not compliant with NFPA minimum standards.**

The Office of the Fire Marshal conducts inspections only of stations and station facilities, and no one with similar qualifications or subject matter expertise inspects lighting, fire and life safety equipment, egress, combustible debris or other safety assets inside tunnels or other underground facilities outside of stations.

Metrorail stated that only Plant Maintenance inspects tunnel egress shafts, with no associated involvement of Track and Structures (TRST), Office of the Fire Marshal or other fire and life safety personnel.





**Involving trained and qualified fire and life safety inspectors in inspections of tunnels and other underground facilities provides an opportunity to improve safety.**



With regard to Plant Maintenance inspections that Metrorail does schedule, an interview and documents reviewed for this audit demonstrated that some shafts are not inspected at all for an extended period if there is adjacent construction at ground level above the shaft, such as VF-13 at Congress Heights Station. Other shafts were not inspected in summer 2020 or 2021 due to overgrown vegetation near Anacostia Station.

With regard to lighting, Metrorail's fire and life safety experts stated during this audit that they do not inspect for adequate lighting other than in stations, and they were not involved in any assessments of lighting inside tunnels. Adequate and functioning tunnel lighting is critical to safe egress and response in the event of an emergency. In addition to helping customers, workers and first responders safely watch their footing, the lights also indicate to customers the appropriate side of the train to open an emergency door in order to reach the tunnel walkway.

In response to a draft of this report, Metrorail provided tunnel lighting inspection procedures for Low Voltage Electrical Maintenance (LVEM), in a document originally dated November 1, 2017 that was revised for the first time on August 19, 2021 after this audit had begun and after the WMSC had requested additional documentation related to lighting inspections. This procedure assigns LVEM employees to check lighting levels during their work.

Even this revised procedure includes stated requirements that do not match NFPA 101 Life Safety Code (included by reference in NFPA 130 Standard for Fixed Guideway Transit and Passenger Rail Systems) sections 7.9.2.1.1 and 7.9.2.1.2 requiring an average of not less than 1 foot-candle of illumination from emergency lighting facilities, and not less than an average of 0.6 foot-candle illumination beginning after 1.5 hours. However, Metrorail's procedure states that acceptable illumination from emergency lighting is an average of 0.35 foot-candles. The procedure does not include any reference to specific parts of the system built under older design criteria, and applies this systemwide. Metrorail's design criteria have contained another set of emergency lighting requirements that do not meet the NFPA standard, and state that emergency lighting is acceptable in tunnels with a 0.2 foot-candle average illumination. Had this procedure and criteria been effectively reviewed by trained and qualified fire and life safety inspectors, this gap between the NFPA standards and Metrorail's procedures could have been identified and addressed.

Involving trained and qualified fire and life safety inspectors in inspections of tunnels and other underground facilities provides an opportunity to improve safety by identifying issues systematically such as temporary or permanent modifications or reconfigurations that impede access or egress or interfere with established radio use guidelines and procedures.



**Minimum Corrective Action:** Metrorail must develop and implement effective, systematic underground inspection processes by personnel with fire and life safety expertise to ensure safe egress, emergency preparedness and effective fire and life safety response. This must include review and approval of inspection criteria and requirements by subject-matter experts in fire and life safety, and a demonstration that all criteria comply with current NFPA standards.

**The exit stairwell from Rosslyn Station is not protected from obstructions, which creates a risk that the hatch will not be able to be opened in an emergency, trapping customers inside.**

The exit hatch from the emergency exit stairs built alongside new high-speed elevators at Rosslyn Station is in a sidewalk area with a curb-cut that allows vehicles to pull up onto and park on top of the stairwell hatch. The hatch is not marked with any protective measures such as no parking signage, does not have any bollards to prevent vehicles from parking on it, and appears to the general public to be a parking space for service vehicles for adjacent buildings or WMATA.

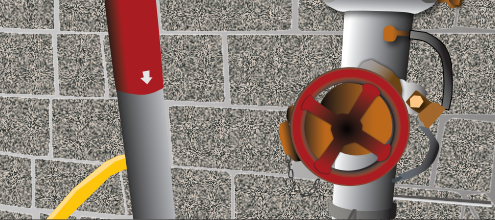
If a vehicle is parked in that area, anyone attempting to exit the station would be trapped inside the stairwell. This safety concern was identified and raised to Metrorail personnel during a site visit conducted on August 5, 2021.

**Minimum Corrective Action:** Metrorail must ensure that bollards or other appropriate physical protection are installed to prevent the blocking of this emergency exit. Metrorail must assess any similar locations elsewhere in the Metrorail system, and act on the findings of that assessment if any additional protections are required.

**Metrorail does not consistently inspect and maintain current certification status of all fire extinguishers, particularly those on the roadway.**

Metrorail has not regularly inspected and maintained current certification status of all fire extinguishers on the roadway, including in tunnels, which are present to provide an opportunity for Metrorail personnel to safely extinguish fires that may occur before they grow into an even larger safety concern. During the WMSC's site visits for this audit, multiple extinguishers in tunnels were observed to be extremely dirty, indicating that they had not been maintained for an extended period.

The WMSC has also found expired fire extinguishers during inspections conducted separately from this audit, including extinguishers on the roadway near West Falls Church Rail Yard. Metrorail's internal inspections have also identified fire extinguishers that are not properly mounted, are out of date or have other deficiencies requiring correction. During this audit, the WMSC also identified that a small fraction of the extinguishers checked in stations and ancillary rooms as had out-of-date inspections



**Metrorail does not have a single, unified fire extinguisher program.**

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or had inspections that had been missed. Most fire extinguishers at the stations the WMSC visited had been inspected as required for August 2021.

Metrorail does not have a single, unified fire extinguisher program; instead, multiple organizational units are expected to inspect and maintain fire extinguishers in different locations such as Plant Maintenance for those extinguishers in stations and Car Maintenance for those on trains. Fire protection personnel stated that Track and Structures (TRST) is supposed to be responsible for fire extinguishers on the roadway, however it is not clear that frontline TRST personnel have the appropriate training to carry this out or clearly understand this responsibility.

**Minimum Corrective Action:** Metrorail must establish a comprehensive process to track, inspect, document maintenance and testing, and ensure replacement of expired fire extinguishers in the Metrorail system.

**Metrorail does not consistently perform or document all elements of its Fire & Intrusion Alarm System Inspection Preventive Maintenance Instructions.**

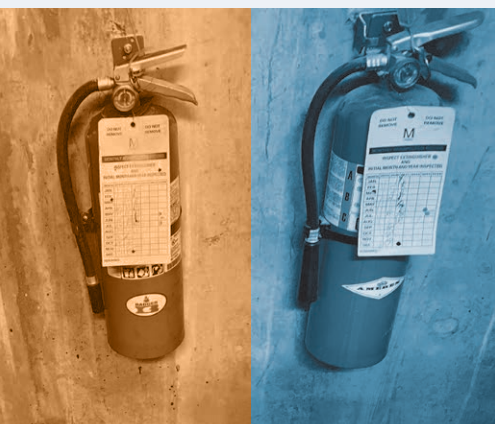


Metrorail's Fire & Intrusion Alarm (FIA) System Inspection Preventative Maintenance Instructions (PMI) specify that annual testing includes:

- the activation of elevator recall functions which ensure elevators are in the proper positions for emergency responders in the event of smoke or fire and prevent customers from using the elevators in the event of a fire
- the activation of escalator stop functions in the event of a smoke detector activation in the escalator pit
- the automatic opening functions of fare gates in the event of smoke or fire.

Generally, the purpose of these and similar safety functions in an emergency is to facilitate safe egress and emergency response when there is smoke or fire. The PMI lists these in the context of annual inspection requirements, generally to be conducted outside of revenue service hours.

However, when the WMSC requested documentation of the most recent tests of these functions for all stations on the B Line (Gallery Place through Glenmont stations), Metrorail provided a record of this testing only for Takoma Station, which was completed on February 10, 2015. This testing identified deficiencies in the manual pull station in the station manager kiosk, the elevator recall function, the escalator stop function, the opening of fare gates, and the volume of audible warning announcements.



**The lack of documented testing means that Metrorail cannot reasonably ensure that these safety features will function as intended in the event of an emergency.**

Metrorail also provided records of a separate 2020 FIA system test of other functions at Takoma Station, and similar separate 2020 and 2021 FIA system tests at other B Line stations that did not include the items listed in the procedure related to delay escalator stop, fare gate open interface, and elevator recall.

The B Line document request was part of follow up requests made as part of this audit to provide Metrorail additional opportunities to provide all relevant documentation. No documentation of the evacuation systems testing was provided as part of initial document requests for the D Line (the portion of the Orange, Silver and Blue Lines between Federal Triangle and New Carrollton stations).



The lack of documented testing means that Metrorail cannot reasonably ensure that these safety features will function as intended in the event of an emergency. Among other things, this creates a risk that stations will not be evacuated in a timely manner if the fare gates do not open automatically, and that first responders will not be able to access the station as efficiently as possible if the elevators are not properly positioned.

Personnel interviewed for this audit could only provide examples of this type of annual emergency systems testing for stations that were shut down for long-term reconstruction projects such as the platform reconstruction projects that have occurred since 2019.

**Minimum Corrective Action:** Metrorail must conduct all testing required by its procedures, and ensure that this testing is scheduled and completed on an ongoing basis by scheduling this work, by providing appropriate opportunities and documentation to conduct the work, and by effectively training assigned employees to conduct the work. Until testing is up to date, Metrorail must inventory overdue testing and prioritize work with appropriate urgency to ensure that the risks introduced by the failure to conduct required testing are mitigated as expeditiously as possible.

**The WMSC raised specific safety issues to Metrorail personnel as they were identified. This includes safety deficiencies related to the Red Line Tunnel Ventilation Pilot Project, obstructed egress paths, signage and other issues.**







**Expanding JST to reach more Metrorail personnel, including those in supporting operations departments and all frontline MTPD personnel, would provide benefits in the event that those individuals are part of an emergency response.**



## RECOMMENDATIONS

- 1 **Metrorail has opportunities to improve and expand training and training coordination related to fire and life safety and emergency management.**

Metrorail organizational units act independently, in an uncoordinated fashion, in relation to both training of Metrorail personnel and training for jurisdictional first responders, with limited tracking of some of these training processes.

Metrorail's unplanned shift of many elements of OEM to SAFE, and SAFE's ongoing efforts to reconstitute the group as the Office of Emergency Preparedness, highlighted gaps in Metrorail's collective understanding of who is responsible for training employees internally, who is training law enforcement and fire personnel, and the degree of internal oversight for other internal training programs.

As noted in Finding 2, the implementation of the IMO position led to a decline in training for local first responders, and disrupted some Joint Supervisory Training (JST), each of which is described by jurisdictional first responders as critical to safety improvements made since the fatal 2015 smoke accident near L'Enfant Plaza Station.

OEM also frequently escorted fire department personnel into the system for familiarization or other purposes outside of emergencies, however those opportunities also declined with the use of OEM personnel in the IMO role without complete consideration of the impacts of these changes.

Multiple people interviewed for this audit stated that not enough Metrorail personnel get to fully experience and take on an active role in Metrorail's full-scale emergency exercises. This was also identified during the WMSC's ROCC Audit issued in September 2020, which Metrorail is addressing specifically for rail controllers through CAP C-0065. Expanding these emergency exercises, and restoring the frequency to at least four times per year as originally implemented in response to 2016 NTSB recommendation R-16-026 would provide important benefits, including the opportunities to identify and implement lessons learned such as following the incident command process and the importance of ensuring clear communication.

Relatedly, not all individuals involved in the incident command structure during emergencies have participated in JST. Expanding JST to reach more Metrorail personnel, including those in supporting operations departments and all frontline MTPD personnel, would provide benefits in the event that those individuals are part of an emergency response. Regardless, JST should be regularly updated to match NIMS/ICS and the latest version of SOP 1A or related procedures, and should include scenarios where someone from the fire department is incident commander

and scenarios where others are incident commander. Joint Supervisory Training was described in interviews as intended to familiarize jurisdictional personnel with the rail system and Metrorail processes and as intended to provide Metrorail personnel with familiarity with jurisdictional response processes. Metrorail's PTASP separately describes "Joint Supervisor Training" as training where "[p]ersonnel from jurisdictional law enforcement, fire departments and transportation departments are provided training in their role to manage traffic and pedestrian flow in the event of a major Metrorail service delay." The Joint Supervisory Training Participant Manual states that the "intent of the course is to strengthen the coordination, collaboration and communications between Metro's departments, first responders and our customers," including information about NIMS, ICS and the importance of customer service during an incident. The 2013 manual states that eventually "all Metro employees having a role in emergency response and recovery activities are expected to complete this course." Training slides provided as part of this audit state that the goal of JST is to improve response to and mitigation of Metrorail incidents by promoting cooperation, coordination and communication across the WMATA disciplines, jurisdictional emergency responders and passengers.

In response to several safety event investigations over the last year, Metrorail has stated that it will ensure that MTPD training is reviewed by operational departments and will make other adjustments to MTPD training related to safety and operational procedures.

Related to fire and life safety assets, investigation W-0111 described above, related to a serious employee injury at Shaw-Howard U Station on April 12, 2021, identified that Metrorail had not provided adequate training and direction to fire protection technicians performing standpipe flow and hydrostatic testing. Metrorail had not completed the process of developing, distributing and providing training on checklists or similar test forms for this task. Following this event, Metrorail conducted a job hazard analysis for standpipe and hydrostatic testing. This analysis determined that additional training is required for Plant Maintenance technicians performing this work, including on additional forms and on National Fire Protection Association (NFPA) Standards 14, 25 and 130.

Personnel interviewed for this audit also expressed a need for additional training on other fire and life safety assets. Personnel working on programmable logic controllers (PLCs) stated that they do not get formal training on each type of PLC they work with. Network technicians also stated that they would benefit from electrical diagnostics training to improve the efficiency and effectiveness of troubleshooting and other work. ITNCS appears to have no qualification requirements other than on-the-job training, which makes it difficult to assess whether each employee has been properly trained and qualified for the role.





**Possible Corrective Action:** Metrorail may conduct an evaluation of the efficacy of JST to meet training objectives, including defining specific skill sets and competencies that students must learn. Metrorail may conduct an assessment of the WMATA personnel and frequency of training required to accomplish the goals of JST, other first responder training initiatives and emergency exercises to ensure that Metrorail is appropriately staffed, trained and scaled to provide the required training. Metrorail may act on those evaluations and assessments to update JST and other training initiatives and exercises, and create a recurring process for review of and involvement in MTPD training by operational departments. Metrorail may also assess the need for additional training on fire and life safety asset maintenance, inspection and repair, and implement the improvements the assessment identifies.

## ② MTPD does not have a useable incident checklist for emergencies.

Despite Metrorail commitments in response to safety event investigations, Metrorail has not developed, distributed and provided training on a useable checklist for MTPD officers to use during an emergency response. A document that was provided as part of this audit is not structured for use in the field, does not flow logically, and does not use clearly defined terms.

For example, the checklist that was provided in a format that is not useful in the field first directs someone to request additional resources, then to identify what resources are needed. It also puts supervisors enroute ahead of verifying the incident.

MTPD officers stated that they had not used a checklist, and MTPD supervisors stated that frontline officers do not need to be aware of these items because a supervisor usually responds several minutes after the officer has begun serving as the incident commander. However, multiple investigations have demonstrated challenges in establishing and communicating incident command or other information that have contributed to issues with emergency management and response.

**Possible Corrective Action:** Metrorail may develop, distribute and provide training on a useable checklist or similar tool for MTPD officers to use during emergency response, including in relation to the establishment and transfer of incident command.

## ③ Metrorail fire and life safety signage is not consistent throughout the system.

Metrorail has multiple types and scales of signage related to directions for things like emergency egress and fire department





**In Room 200 at Anacostia Station, there is not an exit sign posted on any of the multiple doors that workers might take to depart the room, which could lead to workers fleeing into a high voltage area in an emergency rather than using the emergency exit path, which is unmarked.**



connections (FDC), and some areas where a lack of signage creates confusion regarding the egress route or location of fire and life safety and emergency equipment.

For example, in Room 200 at Anacostia Station, there is not an exit sign posted on any of the multiple doors that workers might take to depart the room, which could lead to workers fleeing into a high voltage area in an emergency rather than using the emergency exit path, which is unmarked. As with other safety deficiencies identified during this audit, the WMSC raised this immediately with the Metrorail personnel who accompanied the WMSC on that site visit including the Fire Marshal.



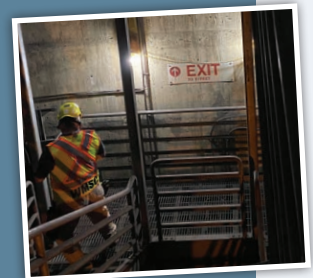
Also at Anacostia Station, there is an emergency tunnel evacuation cart (ETEC) in a room past the end gate due to the station's unique platform configuration, however there is no signage near the escalators at the end of the platform where the ETEC would typically be located that indicates that the ETEC is available beyond the platform end gate. Due to the unusual configuration and lack of signage, first responders in an emergency may not be aware that the ETEC is there.

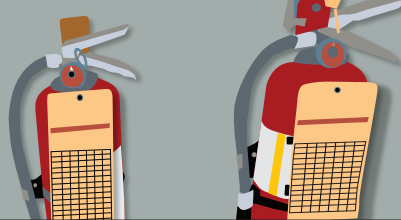


In multiple stations visited as part of this audit, there are no third rail warning signs for personnel exiting ancillary rooms to the roadway or catwalk. There were also conflicting signs directing customers toward areas of rescue, areas of rescue assistance, areas of refuge, or areas of safe dispersal, and tunnel signs with directions to the nearest station were not uniformly present at the sites visited as part of this audit.

Metrorail later provided a working draft revision of SOP 54, Procedures for Areas of Refuge, that would better define areas of rescue and areas of safe dispersal, but that still included aspects of reporting information via multiple channels, which would be outside of the NIMS structure.

Other emergency egress paths, such as the exit stairs at Forest Glen Station and doors connected to the exit stairs at Rosslyn Station, lack understandable signage that would be necessary to accurately ascertain the location of an emergency or other needed assistance. Without specific information about how far up the extremely long staircase a person is located, it is difficult to respond to the location as quickly as possible in an emergency. Additionally, in the Rosslyn Station exit stairs, an unmarked door part of the way up the stairs led to grating with no chain for fall protection across a ladder that is just a few feet from the door. The door should be marked "no exit," with an





**The critical aspects of signage relate to emergency egress paths, a clear signage plan that includes compliance with code requirements, and promoting consistency across the system so that customers, workers or first responders can easily understand the intended message.**

exit sign directing people to continue up the stairs. A door back to the faregate area from the stairs was also marked as an exit door but it was locked.

Each of Metrorail's hundreds of fire department connection (FDC) signs is unique, with some upgraded areas better than others, but no consistency across the system. The shaft ID on metal plates on the standpipes are also difficult to read. Metrorail personnel stated that they are planning more visible FDC signage outside stations, similar to signage that has been placed at Anacostia Station, but that it is a slow, resource-intensive effort.

The critical aspects of signage relate to emergency egress paths, a clear signage plan that includes compliance with code requirements, and promoting consistency across the system so that customers, workers or first responders can easily understand the intended messages in the event of an emergency.

This is also important because some station addresses used for Metrorail fire maps do not match up with the access points that need to be used by first responders.

**Possible Corrective Action:** Metrorail may develop and institute a signage plan and associated inspections, maintenance and repair to ensure consistency and adequacy of emergency and fire and life safety signage throughout the system.

#### **4 Metrorail's organizational structure contributes to mismatches between fire and life safety and emergency management personnel and their responsibilities.**

Fire protection and plumbing personnel in Plant Maintenance, fire prevention personnel in SAFE, emergency planning personnel, and (as noted in Finding 2) personnel responsible for jurisdictional first responder training stated that their groups face challenges in completing their work due to the limited number of personnel available with the required expertise. At the same time, there are positions in some of the departments reviewed during this audit that may be duplicative.

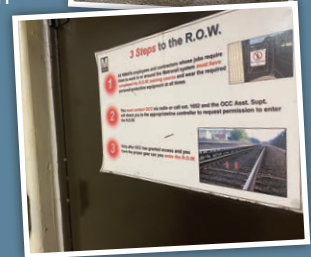
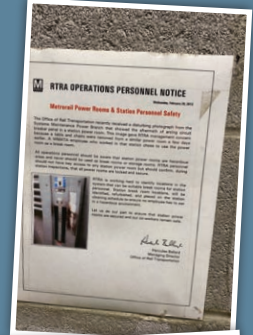
The WMSC acknowledges Metrorail's planning had just begun at the time of this audit in summer 2021 to determine how to integrate OEM into SAFE after the entity was shifted from MTPD several months earlier. The future-state plans presented to the WMSC included hiring additional personnel to serve in a dual IMO and training role as part of response and recovery coordination responsibilities. Engineering and Architecture (ENGA) also stated that it was in



**Multiple individuals expressed concerns about MTPD radio communication, particularly in underground portions of the Metrorail system.**

the process of hiring a second fire protection engineer to address workload challenges, and communications and network services was about to grow significantly through both contractors and employees at the time of this audit to address tunnel smoke detection, fire alarm systems, radio systems, and other projects.

Other organizational adjustments may be required. The Fire Marshal's Office reported high workload, with involvement in projects ranging from fire watch to procedural revisions, and should also be involved in construction and other project review on a regular basis. The Plant Maintenance fire protection and plumbing team responsible for assets such as sprinklers, ETECs, fire extinguishers, exit shafts, and standpipes also reported that they are not completing all of the work that they would hope to accomplish on time, including difficulties meeting a five-year standpipe inspection schedule that includes parking garages. These challenges are expected to grow with the opening of Silver Line Phase 2 as soon as 2022 unless adequate additional staff are added.



Both ENGA, who sets inspection requirements for some systems, and the Fire Marshal say that they do not have the personnel to perform all of the inspections and oversight activities that they believe are necessary.

**Possible Corrective Action:** Metrorail may conduct a workload assessment to determine the appropriate staffing for fire and life safety and emergency management and related disciplines, and act on that assessment to provide an appropriate structure and staffing levels.

##### **⑤ Metrorail does not assess and communicate radio system outages to MTPD officers.**

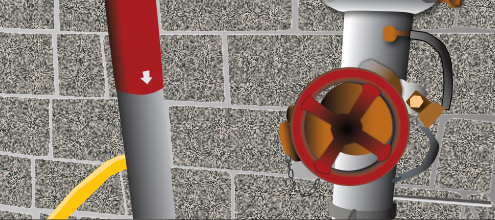
Multiple individuals expressed concerns about MTPD radio communication, particularly in underground portions of the Metrorail system.

These concerns included challenges communicating with MTPD from the ROCC, challenges for officers communicating from within stations to supervisors or dispatchers, and instances where investigations have identified radio communications challenges for MTPD personnel.

The specific locations of dead spots are not proactively communicated to frontline MTPD officers. MTPD officers have resorted at times to using cell phones to communicate in place of their radios, which does not allow other Metrorail personnel to maintain situational awareness.







**Metrorail was in the process at the time of this audit of a tunnel smoke detection pilot at 11 vent shaft and fan shaft locations, generally around Metro Center, Federal Triangle and Smithsonian stations.**



In addition to interviews during this audit, WMSC investigations including W-0084 and W-0114 have identified communications system deficiencies that contributed to challenges in MTPD response.

According to communications and MTPD personnel, MTPD frequently reports these issues to communications.

Metrorail is in the process of building and launching an entirely new radio system, but must maintain the current system until the new radio system is activated.

**Possible Corrective Action:** Metrorail may identify and communicate radio dead spots to frontline MTPD personnel and management, with documented plans and schedules for resolution prioritized based on hazard analyses, and regular updates as issues are identified and resolved.

## Other observations

Metrorail was in the process of adjusting its emergency procedures agreement with the jurisdictional fire chiefs (via the Metropolitan Washington Council of Governments) at the time of this audit. The region was also in the process of changing the fire liaison position from uniformed officers to retired officers who could serve in the role on a more regular and consistent basis. The transition had not yet occurred at the time of this audit.

Metrorail was in the process at the time of this audit of a tunnel smoke detection pilot at 11 vent shaft and fan shaft locations, generally around Metro Center, Federal Triangle and Smithsonian stations. Metrorail plans a trial period after start-up and commissioning, including assessments of the filters in the system intended to limit false alarms. In the pilot phase, the graphical user interface (GUI) indicating alarms will be in the ROCC, but not a part of regular response procedures or visible to controllers during normal operations. As with all projects, Metrorail must be mindful of the safety certification processes that will need to continue if the pilot project is expanded.

During site visits for this audit, the WMSC identified, and WMATA corrected, a number of specific issues such as:

- An obstructed egress path at Forest Glen Station through the emergency exit around one of the roll-down fire doors
- Chair and other debris further blocking egress path in shafts where work was being conducted on tunnel ventilation project
- Obstructed signage
- Chains placed in an effort to extend the protective handrail at Fort Totten Station that obstructed an exit path



- Broken fire alarm pull box in the area of refuge (AOR) at Forest Glen Station and a station manager kiosk at Navy Yard-Ballpark Station
- Ladders obstructing the entry to the AOR at Forest Glen Station
- Trash in an eye wash station in Forest Glen Station (Note: the eye wash station was supposed to be tested weekly, but no testing was indicated on tags. Activating the station required opening a valve that would not necessarily be obvious in an emergency, and reaching the eye wash station required crossing pipes that posed tripping hazards)
- An old ladder that had been left in a precarious position leaning against conduit in a non-public room at Forest Glen Station
- One exit door from AOR at Forest Glen Station was propped open, and a piece of cardboard was obstructing exit stairs
- Debris and similar issues in rooms such as at Navy Yard-Ballpark Station
- Arlington Cemetery Station: CO2 extinguisher sitting on floor of hallway was not mounted. Fixed on site by putting it back in proper place in Room 210 (appeared to have been used as door stop in hallway)
- An open Traction Power room door in Navy Yard-Ballpark Station



Metrorail personnel who accompanied the WMSC audit team for the site visits conveyed other items that the WMSC identified that could not be immediately addressed to other Metrorail personnel for repair or other follow-up. This included housekeeping-related safety issues such as debris improperly stored in station ancillary rooms, vent shafts or the stub tunnel at Pentagon Station, footprints that suggested people had been in ancillary rooms without proper protective footwear, inspections of equipment other than fire and life safety equipment that were out of date, old deluge system panels still present and connected to power at Forest Glen Station, damaged doors, water intrusion at Forest Glen and Navy Yard-Ballpark stations, a bolted-down cone permanently covering wires near a fire hydrant outside the Suitland Station entrance,



**During this audit, the WMSC connected D.C. FEMS and the WMATA Fire Marshal to improve lines of communication.**

and deteriorating wood cable spools in vent shaft VF-08 in Navy Yard-Ballpark Station where cigarettes have been dropped from the grate above.

Arlington Cemetery Station was the only station visited with an alarm panel not showing a trouble indication. The station had just reopened following a reconstruction project that included improvements to the alarm system.

During this audit, Metrorail launched a fourth operations desk in the Rail Operations Control Center responsible for the Orange Line and Silver Line from Clarendon Station to points west. WMSC inspections during this changeover identified that ETS boxes did not call the proper operations desk after the changeover. Metrorail corrected this issue after being notified by the WMSC.

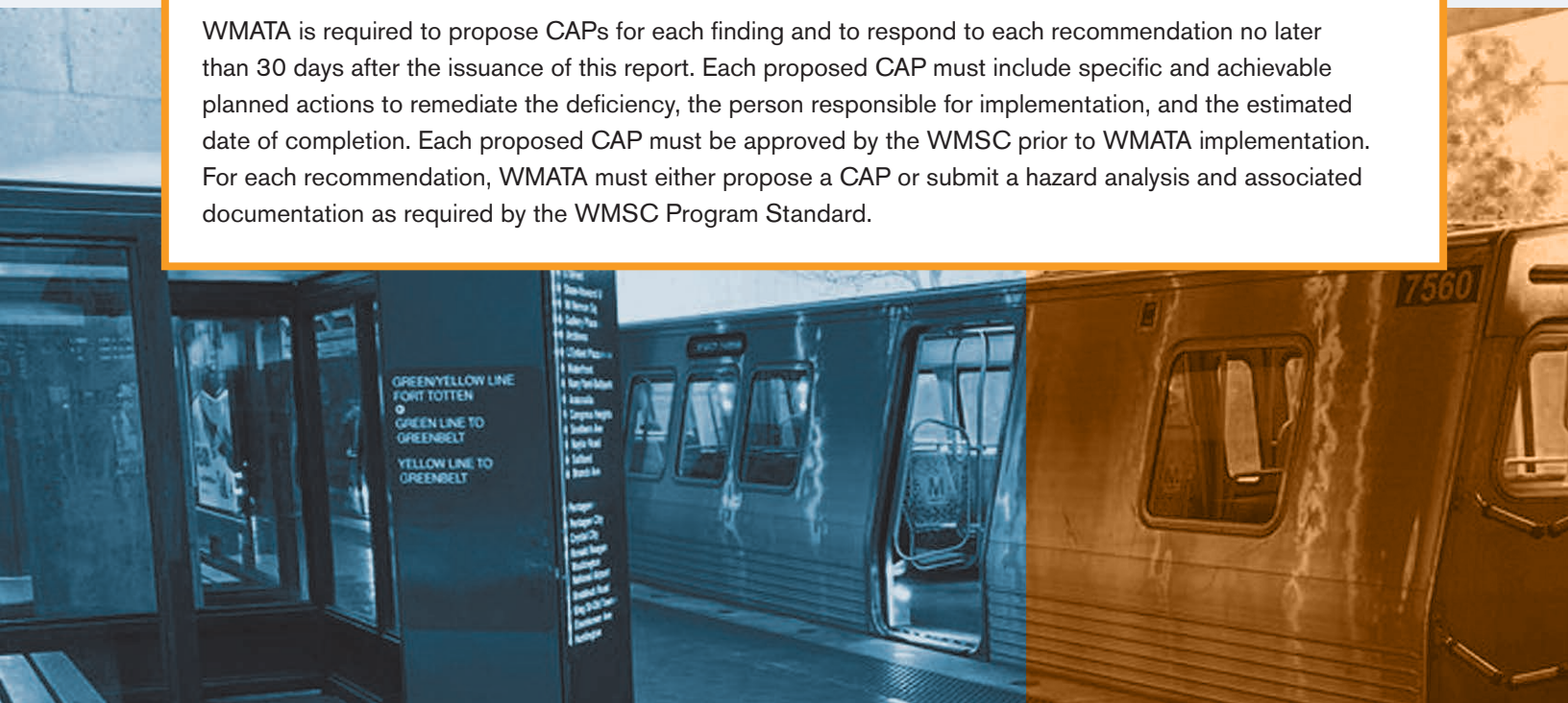
Metrorail is in the process of separating some intrusion alarms from the fire alarm system.

This audit was conducted during the ongoing, long-term COVID-19 public health emergency. This has led to Metrorail's near-continuous use of its Continuity of Operations Plan (COOP).

During this audit, the WMSC connected D.C. FEMS and the WMATA Fire Marshal to improve lines of communication.

## Next Steps

WMATA is required to propose CAPs for each finding and to respond to each recommendation no later than 30 days after the issuance of this report. Each proposed CAP must include specific and achievable planned actions to remediate the deficiency, the person responsible for implementation, and the estimated date of completion. Each proposed CAP must be approved by the WMSC prior to WMATA implementation. For each recommendation, WMATA must either propose a CAP or submit a hazard analysis and associated documentation as required by the WMSC Program Standard.







Appendices **A**, **B**, **C** and **D**

# Appendices A, B, C and D

## Appendix A: Personnel Interviewed

### ➤ Engineering and Architecture (ENGA)

- ♦ Manager, Engineering (Mechanical Engineering)
- ♦ Fire Protection Engineer (Mechanical Engineering)
- ♦ Director of Communication (COMM) & Network Systems
- ♦ Manager, Engineering (Communications)
- ♦ Fire Protection Engineer (contractor) (Communications)

### ➤ Network Technical Operations and Maintenance (ITNCS)

- ♦ Manager, Network Technical Operations and Maintenance
- ♦ Integrated Network Technician B
- ♦ Integrated Network Technician AA

### ➤ Plant Maintenance (PLNT)

- ♦ General Equipment Mechanic AA
- ♦ General Equipment Mechanic B
- ♦ Industrial Control Technician
- ♦ Supervisor Craft Crew
- ♦ Supervisor Fire Equipment
- ♦ Assistant Superintendent

### ➤ Safety and Environmental Management (SAFE)

- ♦ Executive Vice President & Chief Safety Officer
- ♦ Vice President & Assistant Chief Safety Officer (2)

- ♦ Fire Marshal
- ♦ Manager Performance Monitoring
- ♦ Senior Fire Life Safety Officer
- ♦ Fire Life Safety Liaison
- ♦ Emergency Management Coordinator

### ➤ Metro Transit Police Department (MTPD)

- ♦ Deputy Chief (2)
- ♦ Lieutenant
- ♦ Sergeant
- ♦ Officer (2)

### ➤ Traction Power Maintenance (TRPM)

- ♦ Acting Assistant Superintendent (TRPM)
- ♦ Shift Supervisor (TRPM)
- ♦ Mechanic AA Electrical Power High-Voltage (TRPM)

### ➤ Rail Operations Control Center (ROCC)

- ♦ Assistant Operations Manager

### ➤ External to WMATA

- ♦ Chair, Passenger Rail Safety Subcommittee (PRSS) of the Senior Operations Chiefs Committee of the Metropolitan Washington Council of Governments (MWCOG) Fire Chiefs Committee
- ♦ Fire Liaison (Montgomery County Fire and Rescue Service)



## Appendix B: Site Visits

- Farragut North Station
- Cleveland Park Station
- Red Line Tunnel Ventilation Pilot Project
- Forest Glen Station
- Fort Totten Station
- Farragut West Station
- Rosslyn Station
- Arlington Cemetery Station
- Pentagon Station
- Navy Yard-Ballpark Station
- Anacostia Station (including elements of parking garage)
- Suitland Station (including elements of parking garage)





## Appendix C: Documents Reviewed

- System Safety Program Plan (SSPP) (1/2019)
  - WMATA Transit Agency Safety Plan (V1.0, 10/8/2020)
  - WMATA Safety and Security Certification Program Plan (1/2020, Rev. 4)
  - WMATA Manual of Design Criteria for Maintaining and Continued Operation of Facilities and Systems (February 2014)
  - WMATA Metrorail System Signage Design Manual (Spring 2020)
  - Metrorail Emergency Response Maps, all stations (issued 5/2017)
  - Emergency Operations Plan 2020-2022 (8/20/2020)
  - WMATA Continuity of Operations Authority-wide Plan (COOP) 2020-2022 (8/20/2020)
  - Flood Emergency Response Plan (4/2017)
  - WMATA specifications, Section 21 12 05 (13905), Fire Protection and Suppression (V2, 11/2019)
  - ENGA Mechanical Div. 49, Series 21 specs, American Institute of Architects MasterSpec Section 210553, Identification for Fire-Suppression Piping and Equipment (6/20)
  - ENGA Mechanical Div. 49, Series 22 specs, Section 22 05 16, Expansion Fittings and Loops for Plumbing Piping (various dates)
  - ENGA Mechanical Division 49, Series 23 specs, Section 23 05 23.12, Ball Valves for HVAC Piping (various dates)
  - Forest Glen Station Fire Protection, Suppression, and Alarm specifications, Section 1526 (no date)
  - Final Investigation Report, E21149 (train evacuation at Greensboro Station on 4/15/2021)
  - SARP Equipment Overdue (as of 6/1/2021)
  - REAM Smoke & Fire Incident Analysis (March-May 2021)
  - REAM PMI Compliance Report (May 2021)
  - Arcing Fire Data (spreadsheet) (June 2019 to May 2021)
  - Response, known problem areas (no date)
  - Memorandum, Re: Hydrants Located at Dunn Loring Station (7/30/2021)
  - WMATA Corrective Action Plan To Address NTSB Safety Recommendation R-16-10 (issued 5/23/2016)
  - Grant Funding 2021, OEM Exercises
  - Summary of FLS Contractor support
  - PLNT, GMAC Monthly Checklist form (10/5/2016)
  - Response, Re: Station platform medical supply cabinets (no date)
  - Drills and Exercises Opportunities for Improvement Matrix, spreadsheet (2018-2020)
  - Task Order ENGA2019-012-PLT, Pilot Tunnel Smoke Detection System
  - WMATA Tunnel Smoke Detection test plan (9/3/2021)
  - Tunnel Smoke Detection overnight test schedule, table (9/2/2021)
  - Quality Assurance, Internal Compliance & Oversight (QICO) Internal Safety Review, Department of Safety and Environmental Management (10/30/2019)
- ### ORGANIZATIONAL CHARTS
- COMM org chart (2021)
  - COMM & Network Services (no date)
  - ENGA Mechanical (June 2021)
  - ITIO/NCS – Network Communication Services Maintenance (6/25/21)
  - MTPD leadership (7/12/2021)
  - PLNT EQMT – Equipment Maintenance (3/2021)
  - PLNT BMSS – Building Maintenance & Support Shops (3/2021)
  - SAFE (6/29/2021)
  - TRPM (4/20/2021)
- ### POSITION DESCRIPTIONS
- DECO/SYPM, Supervisory Mechanical Engineer (10/30/1996)
  - TIES/CENI Fire Protection Engineer (3/12/2015)

### POSITION DESCRIPTIONS (Continued)

- TIES/CENI Assistant Project Manager (12/4/2014)
- ENGA, Mechanical Engineer Facilities (4/1/2020)
- ENSS, Manager, Engineering (1/30/2009)
- MTPD
  - ♦ Chief (12/14/2012)
  - ♦ Assistant Chief (8/12/2016)
  - ♦ Deputy Chief (10/10/2018)
  - ♦ Captain (8/21/2018)
  - ♦ Lieutenant (8/21/2018)
  - ♦ Sergeant (9/28/2018)
  - ♦ Police Officer (10/27/2018)
  - ♦ SSRV, Plumber AA Lead, AA, A, B, C, D (11/21/2018)
  - ♦ PLNT, Supervisor, Craft Crew - General Equipment (5/25/2021)
  - ♦ PLNT, Supervisor, Craft Crew (10/17/2019)
  - ♦ PLNT, Fire Equipment Technician AA, A, B, C, D (12/12/2019)
  - ♦ PLNT, General Equipment Mechanic AA, A, B, C, D (4/12/2019)
  - ♦ PLNT, Industrial Control Technician AA Lead, AA, A, B, C, D (11/9/2018)
  - ♦ SAFE, Fire Life Safety Officer (10/18/2016)
  - ♦ SAFE, Fire Marshall [sic] (6/8/2016)
  - ♦ SAFE, Manager, Fire Life Safety (8/2/2016)

### LISTS OF PERSONNEL & ROLES

- BMSS EQMT (Equipment Maintenance) List of Employees (6/4/2021)
- ITIO-NCS Maintenance Functional Responsibilities
- IT-NCS budgeted employees (6/4/2021)
- IT-NCS List of all personnel
- Communications Organizational Plan, list of roles and responsibilities
- List and descriptions of COMM and Network Services approved PCNs and Fire Contract Support
- List of COMM budgeted positions (spreadsheet)

- List of COMM Engineering staff, spreadsheet (2021)
- MTPD Personnel Roster (6/4/2021)
- OEM Team Directory (6/16/2021)
- SAFE Fire Life Safety Group Team Directory (6/22/2021)
- List of all TRPM Employees with Seniority Date
- List of TRPM Employees
- TRPM HV Region Master Roster (5/26/2021)
- TRPM Roles and Responsibilities
- TRPM Vacancies (5/26/2021)

### TRAINING MATERIALS/RECORDS

- 2020 Full-Scale Exercise overview, Vienna Metrorail Station (11/15/2020)
- 2020 Mandatory In-Service Retraining (MIR) Schedule
- 2021 Full-Scale Exercise overview, Branch Ave Metrorail Station (5/16/2021)
- Controller and Evaluator Handbook, 2019 Regional Exercise Series #2: Prince George's County Full-Scale Exercise (9/29/2019)
- Controller and Evaluator Handbook, 2019 Regional Exercise Series #3: Montgomery County Full-Scale Exercise (11/3/2019)
- Regional Exercise Program Series #1 overview, Tenleytown/Friendship Heights (4/28/2019)
- Regional Exercise Program Series #2 overview, Prince George's County (9/29/2019)
- Regional Exercise Program Series #3 overview, Montgomery County (11/3/2019)



## TRAINING MATERIALS/ RECORDS (Continued)

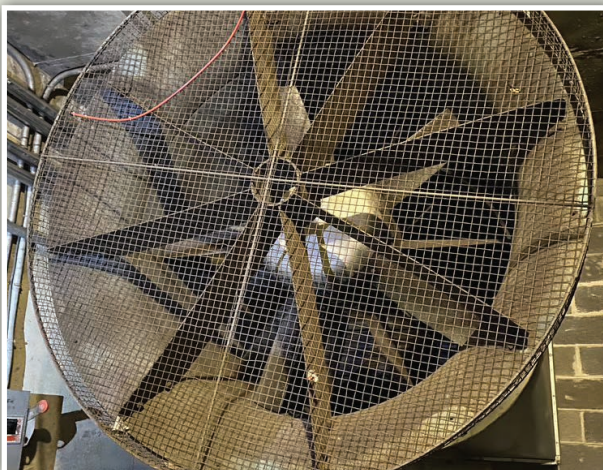


- After-Action Report, 2019 Regional Exercise Series #1: D.C. Full-Scale Exercise (report date 11/7/2019; exercise date 4/28/2019)
- After-Action Report, 2019 Regional Exercise Series #2: Prince George's County Full-Scale Exercise (report date 3/3/2020; exercise date 9/29/2019)
- Controller and Evaluator Handbook, 2019 Regional Exercise Series #1: D.C. Full-Scale Exercise (4/28/2019)
- 2019 MTPD In-Service Program, List of instructors and subject matter
- 2021 Mandatory In-Service Retraining (MIR) Schedule
- 2021 MIR Command & Control Training, NIMS/ICS Scenario 2 functional drill
- Memorandum, Re: MTPD 2021 Mandatory In-Service Retraining (MIR) (3/10/2021)
- Memorandum, MTPD Sergeants Training (7/28/2020)
- MTPD Mandatory In-Service Retraining 2021, slides (3/2021)
- MTPD Mandatory In-Service Retraining 2021, Roadway Operations year 3, slides (3/2021)
- MTPD Mandatory In-Service Retraining Participant's Guide (3/2021)
- MTPD Mandatory In-Service Retraining 2020 Instructor's Guide (4/2020)
- MTPD Mandatory In-Service Retraining Participant's Guide (4/2020)
- MTPD personnel holding RWP (8/1/2021)
- MTPD Academy D.C. Compliance Course, Class 121 weekly schedules (2021)
- MTPD New Sergeants training schedule (2/22/2021-2/26/2021)
- MTPD Recruit Rail Training Schedule (no date)
- MTPD Recruit Training Program Participant Guide (5/2019)
- MTPD Roadway Operations Safety Training Instructor's Guide (1/2019)
- MTPD Roadway Operations Safety Training Participant's Guide (1/2019)
- MTPD Roadway Tools Practical/Checklist (no date)
- MTPD training certificates
- MTPD Roadway Operations Safety, slides (1/2019)
- MTPD Roadway Operations Safety Training Instructor's Guide (1/2019)
- MTPD Roadway Operations Safety Training Participant's Guide (1/2019)
- MTPD List of Training on date Bulletins (3/29/2021, 4/13/2021, 4/26/2021, 5/3/2021, 5/6/2021, 5/19/2021, 5/24/2021, 6/2/2021, 6/7/2021, 6/15/2021, 6/28/2021, 7/13/2021, 7/20/2021, 8/9/2021, 8/16/2021, 8/23/2021, 8/30/2021)
- Basic Metro System Training for Law Enforcement Personnel Instructor's Guide (4/2018)
- Basic Metro System Training for Law Enforcement Personnel Participant Guide (4/2018)
- Basic Metro System Training for Law Enforcement Personnel, slides (no date)
- Basic Metrorail Training for Fire and Rescue Department Personnel Instructor Guide (2/2021)
- Basic Metrorail Training for Fire and Rescue Department Personnel Participant's Guide (3/2018)
- Basic Metrorail Training for Fire and Rescue Department Personnel, slides (2/2021)
- Fire Life Safety Group Employee Transcripts (spreadsheet)

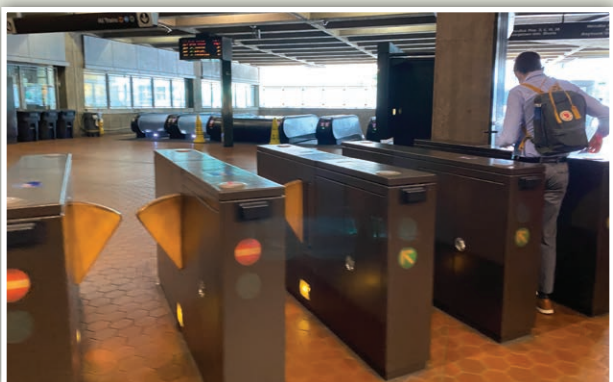


## TRAINING MATERIALS/ RECORDS (Continued)

- Fire Safety Supervisor Module Test Question Syllabus (10/18/2017, Rev. 1)
- Fire Watch Module Test Question Syllabus (10/18/2017, Rev. 1)
- Initial Emergency Response Station Manager Training/Class 20-02 sign in sheet (9/10/2020)
- Initial Emergency Response Station Manager Training/Fire Extinguisher Class sign in sheet (2/10/2020 class)
- Initial Emergency Response Station Manager Training Instructor Guide (1/2018)
- Initial Emergency Response Station Manager Training Participant Guide (6/2019)
- Initial Emergency Response Train Operator Training/Fire Extinguisher class sign in sheet (10/8/2020 class)
- Initial Emergency Response Train Operator Training Instructor Guide (6/2019)
- Initial Emergency Response Train Operator Training Participant Guide (6/2019)
- IT-NCS List of Completed Training (2 Integrated Network Technicians AA; 1 supervisor)
- Northern Virginia Criminal Justice Training Academy Basic Law Enforcement School Lesson Plan (1/2021-6/2021)
- OEM RWP status list
- PLNT Training (spreadsheet)
- Training transcripts for ENGA Mechanical personnel:
  - ♦ Acting Director
  - ♦ Mechanical Engineer
  - ♦ Mechanical Engineer Facilities
  - ♦ Mechanical Engineer
  - ♦ Manager, Mechanical Engineering
  - ♦ Fire Protection Engineer
- Basics of Portable Fire Extinguisher Use, slides (1/19/2018)
- Basics of Portable Fire Extinguisher Use, slides (1/19/2018)
- Commuter Railcar Rescue-Railcar Lifting Techniques Instructor Guide (12/2017)
- Compressed Gas Cylinder Emergency Procedures Review Questions
- Compressed Gas Cylinder Storage, Use & Handling Program Manual (4/2021, Rev. 1)
- Compressed Gas Program Test Questions (8/19/2019)
- Familiarization Module Test Syllabus (10/18/2017, Rev. 1)
- Joint Supervisory Training (12/2019)
- Joint Supervisory Training 2020 update, slides
- Joint Supervisory Training manual (12/2019)
- Joint Supervisory Training sign in sheet (3/3/2021 class)
- Joint Supervisory Training, slides (V2, 2020)
- Hot Work Operator Module Test Question Syllabus (10/18/2017, Rev. 1)
- Hot Work Program Manual (4/2021, Rev. 2)
- Metro Hot Work Program Familiarization Training (10/30/2017) (slides)
- Metro Hot Work Program Fire Safety Supervisor Training (10/31/2017) (slides)
- Metro Hot Work Program Fire Watch Training (10/30/2017) (slides)
- Metro Hot Work Program Hot Work Operator Training (10/31/2017) (slides)
- Metrorail Training for Local CERT Teams, slides (no date)
- OEM Overview, slides (5/7/2021)
- Procedures for Emergencies Involving Compressed Gas Cylinders training module (3/29/2021) (slides)



## TRAINING MATERIALS/ RECORDS (Continued)



- Railcar Lifting Techniques Participant's Guide (12/2017)
- SAFE OEM training transcript, spreadsheet
- NIMS & ICS Review, slides (3/2021)
- NIMS & ICS Review, Command and Control Training, slides (3/2021)
- Staff Notice 2016-025, National Incident Management System (IS-700) (6/8/2016)
- Staff Notice 2017-050, Incident Command System (ICS-100) (10/11/2017)
- TRPM frontline training transcript, spreadsheet
- TRPM managers training transcript, spreadsheet
- TRPM supervisors training transcript, spreadsheet
- WMATA NIMS Training Tracking, spreadsheet

## CLASS EVALUATIONS

- 2019 WMATA Regional Exercise Series #2: Prince George's County Full Scale Exercise Participant Feedback Form (9/29/2019)
- 2019 WMATA Regional Exercise Series #3: Montgomery County Full Scale Exercise Participant Feedback Form (11/3/2019)
- 2020 WMATA Regional Full-Scale Exercise Fairfax County – Vienna Metrorail Station Player Feedback Form (11/15/2020)
- 2021 WMATA Regional Full-Scale Exercise Prince George's County – Branch Avenue Metrorail Station Player Feedback Form (5/16/2021)

- D.C. Fire and EMS Department Training Instructor/Class Evaluation (1/23/2020, 10/13/2020)
- Initial Emergency Response Station Manager Training/Class 20-02 evaluation forms (9/10/2020)
- Initial Emergency Response Station Manager Training/Fire Extinguisher Class Evaluation forms (2/10/2020 class)
- Initial Emergency Response Train Operator Training/Fire Extinguisher Class Evaluation forms (10/8/2020 class)
- Joint Supervisory Training Evaluation forms (3/3/2021, 5/5/2021, 6/2/2021)

## INSPECTIONS

- Fire Life Safety Inspection Checklists:
  - ♦ **A Line**
    - Shady Grove (4/20/2021)
    - Rockville (6/5/2021)
    - Twinbrook (6/5/2021)
    - White Flint (7/5/2020)
    - Grosvenor (7/4/2020)
    - Medical Center (7/5/2020)
    - Bethesda (4/15/2021)
    - Friendship Heights (6/18/2021)
    - Tenleytown (6/18/2021)
    - Van Ness (9/30/2020)
    - Cleveland Park (9/17/2020)
    - Woodley Park (3/6/2020)
    - Dupont Circle (3/31/2021)
    - Farragut North (1/8/2020)
    - Metro Center (9/16/2020)
  - ♦ **D Line**
    - Federal Triangle (7/15/2020)
    - Smithsonian (2/18/2021)
    - L'Enfant Plaza (4/28/2021, 5/2/2021)
    - Federal Center SW (3/3/2021)
    - Capitol South (11/8/2020)
    - Eastern Market (11/10/2020)
    - Potomac Ave (11/15/2020)
    - Stadium Armory (12/7/2021)
    - Minnesota Ave (3/4/2021)
    - Deanwood (1/4/2021)

## INSPECTIONS (Continued)

- Cheverly (1/7/2021)
- Landover (10/15/2020)
- New Carrollton (6/25/2020)
- ♦ **E Line**
  - College Park (4/15/2021)
  - Columbia Heights (11/12/2020)
  - Fort Totten (10/31/2020)
  - Georgia Ave-Petworth (11/12/2020)
  - Greenbelt (6/17/2021)
  - Mt. Vernon Square (3/12/2021)
  - Prince George's Plaza (4/14/2021)
  - Shaw-Howard University (2/4/2021)
  - U Street (4/8/2021)
  - West Hyattsville (1/7/2021)
- ♦ **F Line**
  - Gallery Place (6/29/2020)
  - Archives (10/20/2020)
  - L'Enfant Plaza (4/28/2021, 5/2/2021)
  - Waterfront (1/10/2021)
  - Navy Yard (2/2/2021)
  - Anacostia (10/5/2020)
  - Congress Heights (4/15/2021)
  - Southern Ave (10/21/2020)
  - Naylor Road (2/1/2021)
  - Suitland (5/10/2021)
  - Branch Ave (1/13/2021)
- ♦ **G Line**
  - Benning Road (4/11/2021)
  - Capitol Heights (11/21/2020)
  - Addison Road (3/15/2020)
  - Morgan Boulevard (4/26/2021)
  - Largo Town Center (5/10/2021)
- ♦ **J Line**
  - Franconia-Springfield (3/12/2021)
  - Van Dorn Street (2/2/2021)
- ♦ **K Line**
  - Vienna (4/16/2021)
  - Dunn Loring (10/30/2020)
  - West Falls Church (10/16/2020)
  - East Falls Church (1/9/2021)
  - Ballston (3/16/2021)
- Virginia Square (2/11/2021)
- Clarendon (10/5/2020)
- Court House (9/14/2019)
- Fire Marshal Station Inspection Reports:
  - ♦ **A Line**
    - Shady Grove (4/20/2021)
    - Rockville (6/5/2021)
    - Twinbrook (6/5/2021)
    - White Flint (7/5/2020)
    - Grosvenor (6/17/2020)
    - Medical Center (7/5/2020)
    - Bethesda (4/15/2021)
    - Friendship Heights (6/18/2021)
    - Tenleytown (6/18/2021)
    - Van Ness (9/30/2020)
    - Cleveland Park (9/17/2020)
    - Woodley Park (3/6/2021)
    - Dupont Circle (3/31/2021)
    - Farragut North (3/8/2020)
    - Metro Center (8/17/2020)
  - ♦ **D Line**
    - Federal Triangle (7/15/2020)
    - Smithsonian (2/18/2021)
    - L'Enfant Plaza (4/28/2021)
    - Federal Center SW (3/3/2021)
    - Capitol South (11/8/2020)
    - Eastern Market (11/10/2020)
    - Potomac Ave (11/12/2020)
    - Stadium Armory (11/15/2020)
    - Minnesota Ave (2/2/2021)
    - Deanwood (1/4/2021)





## INSPECTIONS (Continued)



- Cheverly (1/7/2021)
- Landover (10/15/2020)
- New Carrollton (6/25/2020)
- ♦ **E Line**
  - College Park (4/15/2021)
  - Columbia Heights (11/12/2020)
  - Fort Totten (10/31/2020)
  - Georgia Ave-Petworth (11/12/2020)
  - Greenbelt (6/17/2021)
  - Mt. Vernon Square (3/12/2021)
  - Prince George's Plaza (4/14/2021)
  - Shaw-Howard University (2/4/2021)
  - U Street (4/8/2021)
  - West Hyattsville (1/7/2021)
- ♦ **F Line**
  - Gallery Place (6/29/2020)
  - Archives (7/15/2020)
  - L'Enfant Plaza (4/28/2021)
  - Waterfront (1/10/2021)
  - Navy Yard (2/2/2021)
  - Anacostia (10/5/2020)
  - Congress Heights (4/15/2021)
  - Southern Ave (10/21/2020)
  - Naylor Road (2/1/2021)
  - Suitland (5/10/2021)
  - Branch Ave (1/13/2021)
- ♦ **G Line**
  - Benning Road (4/11/2021)
  - Capitol Heights (11/12/2020)
- ♦ **H Line**
  - Addison Road (3/15/2021)
  - Morgan Boulevard (4/26/2021)
  - Largo Town Center (1/4/2021)
- ♦ **J Line**
  - Franconia-Springfield (3/12/2021)
  - Van Dorn Street (2/2/2021)
- ♦ **K Line**
  - Vienna (5/29/2021)
  - Dunn Loring (12/2/2020)
  - West Falls Church (10/10/2020)
  - East Falls Church (6/22/2021)
  - Ballston (3/16/2021)
  - Virginia Square (3/11/2021)
  - Clarendon (10/5/2020)
  - Court House (9/24/2019)
- Systems Maintenance – Power ETS Inspection and Trip Verification Test Plan
  - ♦ E Line CM 003+54 to 026+85 (3/23/2019)
  - ♦ E Line CM 000+00 to 058+00 (3/24/2019)
  - ♦ E Line CM 051+00 to 082+00 (4/2/2019)
  - ♦ E Line CM 362+03 to 438+90 (6/3/2019)
  - ♦ E Line CM 412+82 to 608+00 (7/14/2019)
  - ♦ E Line CM 412+82 to 608+00 (7/15/2019)
  - ♦ E Line CM 608+00 to 502+94 (7/16/2019)
  - ♦ E Line CM 603+56 to 688+04 (8/13/2019)
  - ♦ J Line CM 825+00 to 894+00 (3/16/2020)
  - ♦ J Line CM 507+40 to 568+90 (4/26/2020)
  - ♦ J Line CM 568+90 to 686+78 (5/2/2020)
  - ♦ J Line CM 687+00 to 870+00 (5/26/2020)
  - ♦ TRPM ETS Inspection and Trip Verification Test Logs E route
    - ♦ 3/23/2019
    - ♦ 7/14/2019
    - ♦ 7/15/2019
    - ♦ 7/16/2019
    - ♦ 8/13/2019
- IT-NCS ETS Phones Inspections
  - ♦ King Street-C99 Yard (5/1/2021)
  - ♦ J01-Van Dorn (5/10/2021)
  - ♦ Van Dorn to Franconia-Springfield (1/21/2021)

## INSPECTIONS (Continued)

- ♦ Gallery Place to Mt. Vernon Sq (12/7/2020)
- ♦ Mt. Vernon Sq to Shaw (12/7/2020)
- ♦ Shaw to U Street (12/8/2020)
- ♦ U Street to Columbia Heights (12/9/2020)
- ♦ Columbia Heights to Georgia Ave (12/25/2020)
- ♦ Georgia Ave to Fort Totten (12/21/2020)
- ♦ Fort Totten to West Hyattsville (12/28/2020)
- ♦ West Hyattsville to Prince George's Plaza (1/1/2021)
- ♦ Prince George's Plaza to College Park (12/21/2020)
- ♦ College Park to Greenbelt (12/24/2020)
- ♦ Greenbelt Station to Greenbelt Yard (12/18/2020)
- Wet Sprinkler System, Wet Standpipe System, Deluge System (separate forms) Quarterly Test Reports (PLNT)
  - ♦ Farragut North (5/5/2021)
  - ♦ Dupont Circle (4/23/2021)
  - ♦ Woodley Park (5/5/2021)
  - ♦ Cleveland Park (4/9/2021)
  - ♦ Van Ness (4/15/2021)
  - ♦ Friendship Heights (4/15/2021)
  - ♦ Bethesda (5/11/2021)
  - ♦ Medical Center (5/18/2021)
  - ♦ Grosvenor (4/18/2021)
  - ♦ White Flint (4/18/2021)
  - ♦ Twinbrook (5/13/2021)
  - ♦ Rockville (5/13/2021)
  - ♦ Shady Grove (4/5/2021)
  - ♦ Annual FIA Preventative Maintenance Inspection
  - ♦ **B Line**
    - Gallery Place (9/30/2020)
    - Judiciary Sq (1/26/2021)
    - Union Station (9/1/2020)
    - NoMa-Gallaudet U (10/14/2020)
    - Rhode Island Ave (4/20/2020)
    - Brookland-CUA (4/20/2020)
    - Fort Totten (6/9/2021)
  - Takoma (10/27/2020)
  - Silver Spring (6/2/2021)
  - Forest Glen (7/30/2020)
  - Wheaton (7/31/2020)
  - Glenmont (3/28/2021)
  - ♦ **D Line**
    - Federal Triangle (2/9/2021)
    - Smithsonian (2/9/2021)
    - L'Enfant Plaza (2/25/2021)
    - Federal Center SW (2/25/2021)
    - Capitol South (5/28/2021)
    - Eastern Market (6/22/2021)
    - Potomac Ave (9/2/2020)
    - Stadium Armory (9/28/2020)
    - Minnesota Ave (10/19/2020)
    - Minnesota Ave garage (2/24/2021)
    - Deanwood (11/25/2020)
    - Cheverly (10/22/2019)
    - Landover (3/24/2021)
    - New Carrollton (10/2/2020)
    - D99 Operations Building (D92) (11/6/2020)
- TRST Fire Extinguisher Monthly Inspection
  - ♦ G01-G05 (5/17/2021)
  - ♦ D10-D08, G01 track 1 (5/16/2021, 5/17/2021)
  - ♦ D10-D08, G01 track 2 (5/17/2021)
- PLNT Fire Hydrant Test sheets
  - ♦ Vienna (10/29/2014)
  - ♦ Dunn Loring (10/30/2014)
  - ♦ West Falls Church (10/30/2014, 11/10/2014)



## INSPECTIONS (Continued)

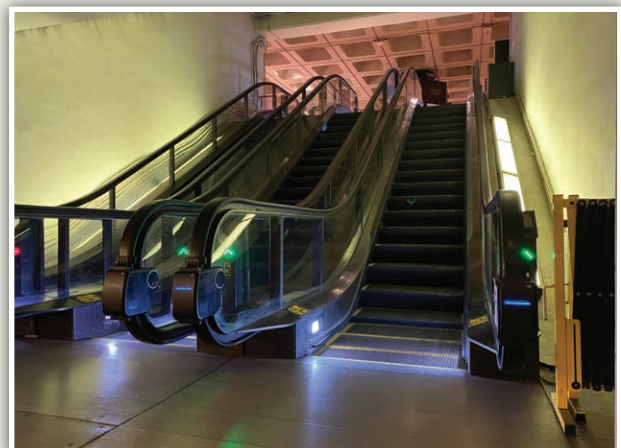


- Standpipe System Test Report (includes hydrostatic and flow test)
  - ♦ Benning Road, FG01 (11/3/2020)
  - ♦ Benning Road, FG02 (9/1/2020)
  - ♦ Benning Road, FG02 (11/17/2020)
  - ♦ Benning Road, VG-01 (8/27/2020)
  - ♦ Capitol Heights, FG-03 (9/3/2020)
  - ♦ Capitol Heights, FG-04 (9/22/2020)
  - ♦ Capitol Heights, VG04 (9/8/2020)
  - ♦ Capitol Heights, FG-04 (9/22/2020)
  - ♦ Capitol Heights, FG-05 (9/10/2020)
  - ♦ Addison Road, station (9/15/2020)
  - ♦ Addison Road, station (9/29/2020)
  - ♦ Morgan Boulevard, EG01-1 (9/24/2020)
  - ♦ Morgan Boulevard, TG02-1 (10/1/2020)
  - ♦ Morgan Boulevard, TG02-2 (10/1/2020)
  - ♦ Morgan Boulevard, EG03-1 (10/6/2020)
  - ♦ Morgan Boulevard, EG03-2 (9/24/2020)
  - ♦ Morgan Boulevard, station (10/15/2020)
  - ♦ Largo Town Center, EG04-1 (10/8/2020)
  - ♦ Largo Town Center, EG04-2 (10/8/2020)
  - ♦ Largo Town Center, north parking garage (10/13/2020)
  - ♦ Largo Town Center, south parking garage (10/13/2020)
  - ♦ Largo Town Center, station (10/20/2020)
  - ♦ Largo Town Center, station (10/29/2020)
- WMATA Emergency Egress Inspection Report (PLNT)
  - ♦ F Line
    - 3/16/2020
    - 7/13/2020
    - 10/16/2020
    - 12/18/2020
    - 4/5/2021
    - 6/29/2021
  - ♦ K Line
    - 3/10/2020
    - 7/8/2020
    - 9/8/2020
    - 12/11/2020
    - 4/7/2021
    - 6/29/2021
  - ♦ Archives, L'Enfant Plaza, Waterfront (6/24/2021)
- Integrated Intercom System Functional Test Datasheet
  - ♦ Brookland (3/10/2021)
  - ♦ Union Station (5/17/2021)
- IIS 28 Day Preventative Maintenance Inspection
  - ♦ NoMa (3/13/2021)
- N Route Intercom
  - ♦ Wiehle-Reston East (6/26/2021)
  - ♦ Spring Hill (6/26/2021)
  - ♦ Greensboro (6/26/2021)
  - ♦ Tysons Corner (6/26/2021)
  - ♦ McLean (6/26/2021)
- Structural Maintenance Inspection Reports
  - ♦ C route, CM 481+00 to 505+50 outbound (1/20/2021)
  - ♦ C route, CM 481+00 to 505+50 inbound (1/22/2021)
  - ♦ C and A connector track outbound (3/15/2021)
  - ♦ C route, Metro Center to McPherson inbound (1/8/2021)
  - ♦ C route, Metro Center to McPherson outbound (3/1/2021)



## INSPECTIONS (Continued)

- ♦ C route, McPherson to Farragut West inbound (6/18/2021)
- ♦ C route, McPherson to Farragut West outbound (3/8/2021)
- ♦ C route, Farragut West to Foggy Bottom outbound (3/2/2021)
- ♦ C route, Farragut West to Foggy Bottom inbound (3/2/2021)
- ♦ C route, Foggy Bottom to Rosslyn inbound (2/23/2021)
- ♦ C route, Foggy Bottom to Rosslyn outbound (2/24/2021)
- ♦ C route, Rosslyn to Rosslyn portal inbound (2/8/2021)
- ♦ C route, Rosslyn to Rosslyn portal outbound (2/8/2021)
- ♦ Pentagon to Pentagon City inbound (2/8/2021)
- ♦ Pentagon to Pentagon City outbound (1/15/2021)
- ♦ Pentagon City to Crystal City inbound (2/17/2021)
- ♦ Pentagon City to Crystal City outbound (2/23/2021)
- ♦ Crystal City to Crystal Portal inbound (3/1/2021)
- ♦ Crystal City to Crystal Portal outbound (3/1/2021)
- ♦ Huntington to Huntington Tail Track inbound (3/12/2021)
- ♦ Huntington to Huntington Tail Track outbound (2/22/2021)
- ♦ King Street Portal CM 569+50 to Portal CM 582+50 outbound (1/21/2021)
- ♦ King Street Portal CM 569+60 to Portal 582+50 inbound (6/29/2021)
- ♦ Pentagon Portal to Pentagon inbound (2/24/2021)
- ♦ Pentagon Portal to Pentagon outbound (3/1/2021)
- Preventive Maintenance Checklist (PM-22-5102) Tunnel Fans, Rev. 2.0
  - ♦ FF10 (4/1/2021)
  - ♦ FF6; VF11, VF12 (4/5/2021)
  - ♦ FF7; VF14 (4/22/2021)
  - ♦ FF8; VF15 (4/20/2021)
  - ♦ FF9 (4/19/2021)
- Preventive Maintenance Checklist (PM-22-5102) Tunnel Fans, Rev. 2.0
  - ♦ FA14; VA22 (5/10/2021)
  - ♦ FA2; VA2 (4/28/2021)
  - ♦ FA14; VA22 (3/22/2021)
  - ♦ FA6; VA8, VA9 (5/12/2021)
  - ♦ FC01; VC01, VC02 (4/6/2021)
  - ♦ FC01; VC01, VC02 (5/27/2021)
  - ♦ FD01; VD01, VD02 (4/14/2021)
- Intercom Preventative Maintenance Program (Rev. 005, 7/19/2018) quarterly test checklists
  - ♦ Smithsonian (5/4/2021)
  - ♦ L'Enfant Plaza (5/5/2021)
  - ♦ Deanwood (6/2021)
  - ♦ Benning Road (6/2021)
  - ♦ Addison Road (4/2021)
- PMI Quarterly PAS Data Sheet
  - ♦ L'Enfant Plaza (6/23/2021)
  - ♦ Federal Center SW (6/23/2021)
  - ♦ Capitol South (6/9/2021)
  - ♦ Stadium-Armory (6/19/2021)



## INSPECTIONS (Continued)



- ◆ Deanwood (6/19/2021)
- ◆ Cheverly (6/23/2021)
- ◆ Capitol Heights (6/3/2021)
- ◆ Federal Triangle (6/23/2021)
- ◆ Smithsonian (6/24/2021)
- ◆ Benning Road (6/3/2021)
- ◆ Potomac Ave (4/7/2021)
- ◆ Addison Road (4/1/2021)
- ◆ Morgan Boulevard (5/31/2021)
- ◆ Largo Town Center (3/31/2021)
- Integrated intercom System Functional Test Datasheet
  - ◆ Capitol South (6/1/2021)
  - ◆ Eastern Market (6/5/2021)
- AED Inspections By Route Stop (June 2021)
- WMATA ETEC Quarterly Inspection Reports
  - ◆ A Line (3/29/2021)
  - ◆ B Line (3/10/2021)
  - ◆ C Line (3/16/2021)
  - ◆ D Line (3/12/2021)
  - ◆ E Line (4/1/2021)
  - ◆ F Line (3/19/2021)
  - ◆ G Line (3/3/2021)
  - ◆ J Line (3/16/2021, 3/29/2021)
- Forest Glen Fire Door Test (8/2/2021)
- BPE International Special Protection System Inspection, Metro Center (6/11/2021)

- SMNT/COMM Fire System Pre-Test Inspection List
- Summary of Jurisdictional Fire Departments and known inspections (table) (no date)
- Arlington County Metrorail Station Inspections, spreadsheet (through 3/1/2021)
- Montgomery County Metro Inspection Data, spreadsheet (through 7/29/2021)
- PLNT ETEC Scheduled Frequency 2021, spreadsheet
- PLNT Egress Scheduled Frequency 2021, spreadsheet
- List of egress shafts that support underground rail stations inspected by SAFE FLS (through 9/1/2021)
- Status of Dry Chemical work orders, spreadsheet (through 8/30/2021)
- Fireline Corp. Invoice, Re: Semi-Annual test and inspection of FM200, Halo and Preaction Fire Suppression Systems (6/1/2021)
- Fire apparatus preventive maintenance schedule (through 8/23/2021)

## PROCESS/SOP/PROCEDURES/ORDERS/BULLETINS

- Fire/Life/Safety Work Order/Escalation Process (no date)
- Fire Life Safety Bulletins
  - ◆ 2020-01, WMATA Tunnel Fan Controls Update (6/22/2021)
  - ◆ 2020-02, WMATA Tunnel Emergency Exit Door Replacement (6/22/2021)
  - ◆ 2020-03, Missing Standpipe Swivels and CAPs (6/22/2021)
  - ◆ 2020-06, Virginia Orange Line Station Enhancements (10/30/2020)
- Safety Bulletins
- 19-12, Holiday Decorating (12/2019)
- 20-06, Alcohol-Based Hand Sanitizer Safety Precautions (6/2020)
- 20-XX [sic], Workplace Fire Safety (8/2020)
- 20-10b, Carbon Monoxide Safety (10/2020)

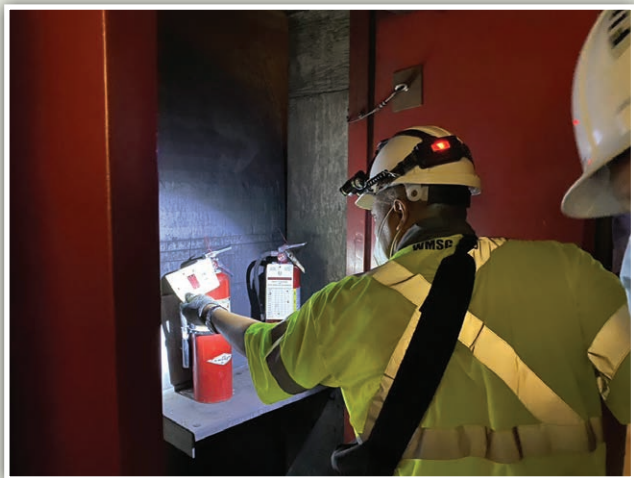
## PROCESS/SOP/PROCEDURES/ORDERS/ BULLETINS (Continued)

- ATCM Accident/Incident Response Safety Measurement System 2021 Field Guide (4/2021)
- Automatic External Defibrillator Program Management Plan 2020-2022 (effective 6/29/2020)
- Drainage Pumping Stations Preventative Maintenance Checklist (7/6/2016)
- Fire & Intrusion Alarm (FIA) System Inspection, Preventive Maintenance Instructions (Rev. 3, 8/16/2018)
- Fire Marshal's Office Work Instruction 700-WI-001, Fire Inspection Procedure (originated 1/27/2020)
- Fire Watch Program Manual (4/2021)
- ITIO-NCS-OPM-001, Emergency Trip Station Phone Maintenance SOP (Rev. 3.0, 11/29/2018, last reviewed 5/3/2021)
- Letter, Re: Document Request for Incident Management Officer position at the ROCC (8/11/2021)
- Memorandum, Re: PLNT fire tech/plumbing workload assessment (9/7/2021)
- Memorandum, Re: ROCC Incident Management Officer (IMO) Role in Power Energization Process (7/28/2021)
- Memorandum, Re: ROCC, Disabled Trains Between Stations (8/5/2021)
- Monthly Preventive Maintenance Checklist with PLC (PM-22-5102) Tunnel Fans (Rev. 2.0)
- Monthly Preventive Maintenance Checklist without PLC (PM-22-5101) Tunnel Fans (Rev. 2.0)
- MTPD General Order 364, Incident Command System (2/1/2011)
- MTPD General Order 365, Major Incident Scene (6/15/2011)
- MTPD General Order 370, Operations Aboard Trains and on the Roadway (1/4/2013)
- MTPD General Order 371, Person Struck by a Metrorail Train (3/13/2013)
- MTPD Incident Command checklist (12/14/2020)
- MTPD OEM Standard Operating Procedure: After-Action Report (2/3/2020)
- MTPD OEM Standard Operating Procedure: Rail Operations Control Center Duty Assignment (5/11/2020)
- MTPD OEM Standard Operating Procedure: Roadway Worker Protection Compliance Check (9/1/2020)
- MTPD OEM Standard Operating Procedure: Warning Strobe and Alarm Device and Hot Stick Management (4/8/2021)
- Permanent Order T-21-24, Replaces MSRPH SOPs 6, 7, and 8 with new SOP: Procedures for Managing Smoke and Fire on the Metrorail System (Approved 6/2/2021, Effective 9/1/2021)
- Permanent Order, T-21-23, Modifies MSRPH SOP #54 Re: Area of Refuge/Area of Safe Dispersal (draft)
- Plant Maintenance Field Work Instruction, Annual Fire Extinguisher Inspections (11/22/2017)
- Plant Maintenance Management Plan (8/11/2020)
- PLNT Field Work Instruction 209-03, Quarterly Emergency Tunnel Evacuation Cart (ETEC) Inspection (10/24/2014)
- PLNT SOP 209-07, Prioritizing and Documenting Maintenance Work (2/19/2020)
- PLNT SOP 209-07, Prioritizing and Documenting Maintenance Work (Rev. 8, 2/13/2020)





## PROCESS/SOP/PROCEDURES/ORDERS/ BULLETINS (Continued)



- PLNT-PM 22-5500 Wet & Dry Standpipe Systems Inspection, Testing & Maintenance Manual (3/5/2021)
- PLNT-PM 22-5510 Inspection, Testing and Maintenance Manual for Fire Hydrants & Fire Service Mains (3/5/2021)
- PLNT-PM 22-5520 Water-Based Fire Protection Systems Inspection, Testing & Maintenance Manual (3/5/2021)
- Preventative Maintenance Inspection, Lighting Inspection and Relamping of WMATA Facilities (2/8/2018)
- Preventive Maintenance Inspection for Emergency Trip Station (ETS) 1092 Day Inspection (Rev. 3, 6/20/2013)
- Amerex Corp., Industrial Dry Chemical Fire Suppression System, Installation, Operation and Maintenance Manual, P/N 15040 (Rev. B, 4/9/2013)
- Quarterly Intercom System Inspection Preventative Maintenance Program (Rev. 5, 7/19/2018)
- Quarterly Public Address System (PAS), Preventative Maintenance Program (Rev. 4, 11/30/2018)
- SAFE SOP 800-01, Incident and Accident Investigations (Rev. 4, 6/30/2021)
- SOP #1A Command, Control, and Coordination of Emergencies on the Rail System (1.3, 2021)
- SOP #2 Emergency Removal and Restoration of Third Rail Power Mainline (1.2, 5/26/2016)
- SOP #4 Customer Evacuation From Train (1.2, 2/16/2016)
- SOP #5 Crowd Control at Stations (1.0, 9/3/2010)
- SOP #6 Fire and Smoke on the Roadway (2.0, 9/24/2018)
- SOP #7 Fire and Smoke on Cars (1.0, 9/3/2010)
- SOP #8 Fire or Smoke in a Passenger Rail Station (1.5, 2/18/2020)
- SOP #9 Train Derailment Mainline and Yard (1.0, 9/3/2010)
- SOP #10 Floods (1.0, 9/3/2010)
- SOP #11 Train Collision Mainline and Yard (1.0, 9/3/2010)
- SOP #13 Undesired Uncoupling or Pull Apart of Cars in a Train (1.0, 9/3/2010)
- SOP #14 Bomb Threat/Suspicious Package/ Unattended Package (1.0, 9/3/2010)
- SOP #27 Flammable Vapor Alarm (1.0, 9/3/2010)
- SOP #31 Coordination of An Emergency in a Common Corridor (1.1, 11/18/2013)
- SOP #37 Hazardous Material (Hazmat) Incident (1.0, 9/3/2010)
- SOP #38 Unknown Substance Response Procedure (1.0, 9/3/2010)
- SOP #42 Hazardous Chemical Detection Alarm Procedures (1.0, 9/3/2010)
- SOP #46 Real Time Loss of Shunt Alarm Event (1.0, 4/2/2012)
- SOP #54 Procedures for the Areas of Refuge (AOR) (1.0, 5/17/2017)
- SOP #54, Procedures for the Areas of Refuge (AOR) (Version 2.0, draft)
- Summary Incident Management Officer Notification Guidelines (V1.0, 7/25/2021)
- Summary WMSC/IMO Event Scene Release Process (V1.0, 7/26/2021)

## PROCESS/SOP/PROCEDURES/ORDERS/ BULLETINS (Continued)

- Temporary Order T-20-31, Modifies MSRPH SOPs #2 and 28 on how ROCC energizes/de-energizes third rail power (Rev. 3.0, approved 6/3/2021, effective 6/16/2021)
- Temporary Order, T-20-31, Rev. 3.0, Modifies MSRPH SOPs #2 and 28 governing how ROCC energizes and de-energizes third rail power (effective 7/16/2021)
- TRPM Business Practice, Inoperable ETS Procedure (ETS 1.2) (last reviewed 7/31/2017)

## LISTS

- Fire Life Safety Equipment List (no date/identifier)
- Fire/Life-Safety Open Work Orders (as of 5/31/2021)
- List of all MTPD Warning Strobe Alarm Devices (WSAD) locations and inspections, spreadsheet (8/2021)
- List of Approved Capital Improvement Projects (CIP) (6/23/2021)
- List of assigned Warning Strobe Alarm Devices (WSAD) (6/22/2021)
- List of CIP Emergency Management FLS Capital Projects (no date)
- List of ENGA Mechanical Dept FLS Projects (no date)
- List of Gaseous Suppression Systems locations (8/26/2021)
- List of Halon Systems at WMATA Facilities
- List of open work orders for 3rd rail cover defects (spreadsheet)
- List of tunnel lighting projects (no date)
- List of WMATA Fire Hydrants, spreadsheet
- List of WMATA owned or maintained fire hydrants
- PLNT work order details for vent shafts/tunnel fans
- List of work orders from LVEM quarterly tunnel spot lamp inspection (spreadsheet)

## WMATA EXTERNAL AGREEMENTS

- Agreement Between WMATA and the Metropolitan Washington Council of Governments, Metrorail Transit – Fire/Rescue Emergency Procedures Policy (2015)
- Fire Protection Equipment and Life Safety Agreement for the Washington Metropolitan Area Rail Rapid Transit System, Metro (11/19/1976)
- Cooperative Agreement Between WMATA and the District of Columbia (1976)

## OTHER PRESENTATIONS

- 49 CFR 239 Passenger Train Emergency Preparedness Debriefing Summary (no date)
- Union Station Uncoupling – Debriefing/Critique Session (11/23/2020)
- Train Separation Incident Union Station 10/9/2020, slides (11/23/2020)
- Glenmont Train Pull Apart Incident – 49 CFR 239 Debriefing Session Meeting Notes (1/14/2021)
- Train Pull Apart Incident Glenmont Station 11/24/2020, slides (1/14/2021)
- Evacuation and Runaway Train Incident Rhode Island Avenue Station 3/26/2021, slides (4/23/2021)
- Rhode Island Avenue Station Evacuation & Runaway Train Incident – 49 CFR 239 Debriefing Session Meeting Notes (4/23/2021)
- Office of Emergency Preparedness Reimagined, slides (8/18/2021)



## OTHER PRESENTATIONS (Continued)



- WMATA Infrastructure Design & Wiring Standards Appendix B Approved Materials (Rev. 1.2, 5/2014)
- Radio & Cellular Infrastructure Renewal Project Design Package 3 schematics, A Line (12/3/2018)
- Radio & Cellular Infrastructure Renewal Project Fiber Optic Infrastructure Installation, Farragut North Station 65% Designs (1/6/2020)
- Fiber Requirement Comparison (spreadsheet)
- Tunnel Ventilation Pilot Program Remote Terminal Units for SCADA System (7/23/2021)

## ADDITIONAL TUNNEL VENTILATION PROJECT DOCUMENTS

- Tunnel Ventilation Pilot Program LED interior Lighting Fixtures (7/27/2021)
- Tunnel Ventilation Pilot Program Undercut Anchors, Bolts angles (8/9/2021)
- Tunnel Ventilation Pilot Program Waterproofing membrane for concrete pads (8/9/2021)
- Letter, Re: WMSC Safety Audit of WMATA Emergency Management and Fire Life Safety-Second Follow-Up Document Request (8/9/2021)

- Letter, Re: WMSC Safety Audit of WMATA Emergency Management and Fire Life Safety-Tunnel Ventilation Project Follow-up Document Request #3 (8/11/2021)
- 2 Letters, Re: WMSC Safety Audit of WMATA Emergency Management and Fire Life Safety-Tunnel Ventilation Project Follow-up Document Safety Request #4 (8/16/2021)
- Letter, re WMSC Safety Audit of WMATA Emergency Management and Fire Life Safety-Tunnel Ventilation Project Follow-up Document Safety Request #6 (8/17/2021)
- Email, Re: Update on Tunnel Ventilation Pilot Program stairs at shafts VA8, VA9 (8/23/2021)
- Potomac Construction Letter re Tunnel Ventilation Pilot Program Temporary Staircase Egress Safety Issue (8/15/2021)
- Timeline of Tunnel Ventilation Pilot Program safety walk stair workplan, spreadsheet (8/21/2021)
- Tunnel Ventilation Improvement Implementation – Phase II RFP Submission (3/15/2019)
- WMATA Infrastructure Design & Wiring Standards (Rev. 1.2, 5/2014)
- Tunnel Ventilation Pilot Program Design Build plans (7/15/2021)
- Tunnel Ventilation Pilot Program Preliminary Hazard Analysis (8/9/2021)
- Tunnel Ventilation Pilot Program list of submittals (8/10/2021)
- 3 Photographs of temporary wooden stairs (8/18/2021)
- Tunnel Ventilation Pilot Program MV 13.8KV Switchgear Shop drawings and Product Data (7/26/2021)
- Tunnel Ventilation Pilot Program Medium Voltage 13.8KV Transformer Shop drawings and Product Data (7/26/2021)
  - ♦ Hazardous materials
  - ♦ Environmental management



## Appendix D: System Safety Program Plan (SSPP) and Public Transportation Agency Safety Plan (PTASP) Elements Covered

➤ SSPP elements covered include:

<b>3.</b>	Overview of Management Structure	<b>12.</b>	Internal Safety Audits
<b>5.</b>	Implementation Activities and Responsibilities	<b>13.</b>	Rules Compliance
<b>6.</b>	Hazard Management Process	<b>14.</b>	Facilities and Equipment Inspections
<b>7.</b>	System Modification	<b>15.</b>	Maintenance Audits and Inspections
<b>8.</b>	Safety Certification	<b>16.</b>	Training and Certification for Employees and Contractors
<b>9.</b>	Safety Data Collection and analysis	<b>17.</b>	Configuration Management and control
<b>10.</b>	Accident Investigation	<b>18.</b>	Compliance with Local, State and Federal Requirements
<b>11.</b>	Emergency Management Program	<b>19.</b>	Hazardous Materials Program

➤ PTASP elements covered include:

### 1. Safety Management Policy

- ◆ Functional area common SMS responsibilities
- ◆ Functional area specific SMS responsibilities
- ◆ SMS documentation

### 2. Safety Risk Management

- ◆ Risk Assessment Process
- ◆ Risk assessment methodology
- ◆ Hazard identification
- ◆ Hazard investigation
- ◆ Hazard analysis and evaluation of safety risk
- ◆ Hazard resolution (mitigation, elimination)
- ◆ Hazard tracking

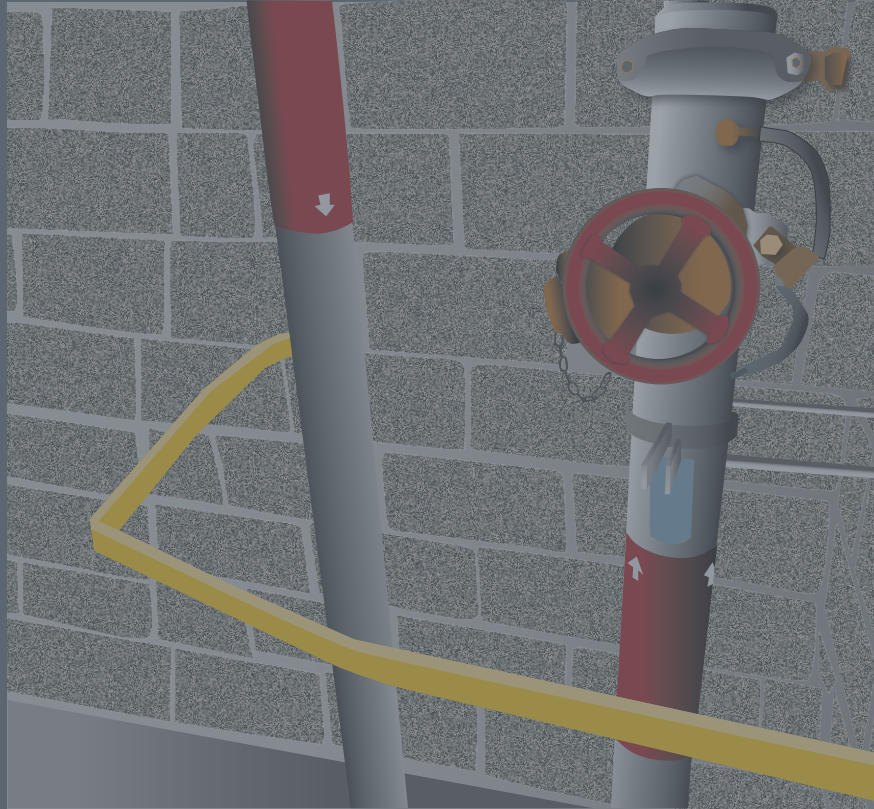
### 3. Safety Assurance

- ♦ Systematic, integrated data monitoring and recording of safety performance
- ♦ Real-time assessment with timely information as to safety management and performance
- ♦ Internal reviews
- ♦ Document assurance activities
- ♦ Preventive, Predictive, and Corrective Maintenance
- ♦ Event reporting/investigations
- ♦ Change management
- ♦ Safety and Security Certification
- ♦ Corrective action plans

### 4. Safety Promotion

- ♦ Training
  - Competencies and Training
  - Employee Safety Training
  - Safety Rules and Procedures Training
  - Training Recordkeeping and Compliance with Training Requirements
- ♦ Contractor Safety
- ♦ Safety Communications
- ♦ Hazard and safety risk information
- ♦ Environmental management
- ♦ Hazardous materials





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