

Tri-State Oversight Committee



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DRPT

Three-Year Safety and Security Review of the Washington Metropolitan Area Transit Authority

Subway Emergency Egress and Equipment Element 14

Review Conducted: November-December 2014

Final Report: July 2, 2015

Introduction

Representatives from the Maryland Department of Transportation (MDOT), the District of Columbia Department of Transportation (DDOT), and the Virginia Department of Rail and Public Transportation (DRPT) comprise the Tri-State Oversight Committee (TOC), which provides regular oversight of the Washington Metropolitan Area Transit Authority (WMATA) Metrorail system. To comply with State Safety Oversight Final Rule 49 Code of Federal Regulations Part 659 (Part 659), the Federal Transit Administration (FTA) requires states to designate a State Safety Oversight (SSO) agency to administer safety and security programs for rail transit and fixed guideway systems within their jurisdictions. Specifically, 49 CFR Part 659 requires TOC to conduct an on-site safety review of each element of the WMATA System Safety Program Plan (SSPP) at least once every three years. These reviews must assess WMATA's implementation with all 21 elements of its SSPP and seven elements of its Security and Emergency Preparedness Plan (SEPP), along with related plans and procedures. Beginning in 2013, the TOC has split its Three-Year Safety and Security Review topic areas into separately occurring reviews spread out during a three-year period.

The following report documents the observations and findings of the TOC's review of WMATA subway emergency egress and equipment. Generally, this review focused on the conditions of Metrorail subway emergency egress assets and associated equipment, and the proper inspection of equipment contained within those facilities. These topics are primarily the responsibility of the offices of Plant Maintenance (PLNT), Power (POWR), and Information Technology (IT), with support from the Department of Safety and Environmental Management (SAFE). The relevant SSPP elements for this review were all or part of:

- Element 14: Facilities and Equipment Inspections

The TOC Program Standard and Procedures defines WMATA requirements for these elements in Section 12 and in Appendix B. Specific requirements are cited further, below.

Methodology

In advance of the review, the TOC requested and reviewed relevant WMATA plans, procedures, checklists, and reports. The on-site portions of the review occurred Dec. 8, 9, and 15, 2014. During the on-site review sessions, the review team interviewed WMATA personnel and reviewed various documents and records to assess compliance with procedures. Persons interviewed and documents reviewed are noted at the end of this report. As the review progressed, TOC representatives discussed preliminary findings and addressed questions from WMATA personnel. This report identifies conditions evident during the review period, regardless of the current progress of potential remediation activities.

Findings are categorized as Findings of Non-Compliance or Findings of Compliance with Recommendation. A Finding of Non-Compliance refers to an instance of WMATA operating out of compliance with an applicable internal or external written requirement, plan, policy, rule, standard, or procedure. Findings of Non-Compliance may be safety-critical in nature. If a Finding of Non-Compliance is identified, WMATA is required to develop an appropriate Corrective Action Plan (CAP) and take action to achieve compliance with the applicable requirement.

A Finding of Compliance with Recommendation refers to a condition whereby WMATA may technically be conducting business in compliance with existing WMATA, TOC, or FTA procedures and requirements; however, there may be no relevant written plan, policy, or procedure in place, or the existing plan, policy, or procedure is not in accordance with industry best practices or standards (such as those by the American Public Transportation Association). Even if there is no “non-compliance” issue, these findings may also be safety-critical in nature. In response to a Finding of Compliance with Recommendation, WMATA is required to formally respond in writing, and is strongly urged to develop an appropriate CAP to update relevant plans, policies, rules, and/or procedures, or to address a particular identified resource or organizational issue. If WMATA determines no CAP is necessary, the agency must complete a hazard analysis in accordance with its hazard management procedure in order to justify taking no action and accept the level of risk associated with the finding.

This review, including all findings presented in this report, intends to assist WMATA with enhancing system safety throughout Metrorail operations. **Upon receipt of this Final Report, WMATA has 45 days to submit CAPs in response to each finding. Each proposed CAP must include the planned action, person responsible, and estimated completion date.** TOC thanks WMATA for providing updates on progress already made toward addressing the findings. TOC requests that WMATA resubmit the material along with its proposed CAPs so that they can be consistently approved and verified.

The TOC would like to thank WMATA personnel for their time, cooperation, and forthrightness throughout the review process.

Current Conditions

The responsibility for subway emergency egress and equipment is primarily with PLNT, with additional support from POWR, COMM, and IT. PLNT employs a staff of Fire Technicians whose specific responsibilities are to inspect subway emergency egress and equipment. PLNT’s Fire Technicians are nearly all current or former firefighters. As such, PLNT does not have formal training for subway emergency egress and equipment inspections, only on-the-job training (OJT); incumbent PLNT Fire Technicians provide OJT to newly-hired Fire Technicians. PLNT, through its staff of Fire Technicians, is responsible for inspecting the emergency egress shafts themselves, as well as the following associated equipment: emergency exit walk-out hatches, Emergency Tunnel Evacuation Carts (ETECs), standpipes, and other fire suppression equipment related to

the subway tunnel and emergency exits. General Equipment Mechanics (GEMS) are responsible for inspecting and maintaining tunnel ventilation fans. The PLNT Fire Technicians also perform external visual inspections of fire extinguishers on an annual basis, which includes checking the six-year maintenance and 12-year hydrostatic certifications. GEMS performs monthly external inspections of fire extinguishers. If either the six-year maintenance certification or the 12-year hydrostatic certification on a fire extinguisher expires prior to the next scheduled annual inspection, the fire extinguisher is replaced and the removed extinguisher is sent to a contractor for service and recertification. PLNT Fire Technicians test sprinklers on a quarterly basis. POWR has responsibility for corrective maintenance of lighting in emergency egress shafts, such as overhead lighting and "Exit" signs. IT is responsible for maintaining emergency telephones. COMM is responsible for maintaining the RAMEX yellow emergency intercom call boxes. The TOC review team observed both emergency telephones and emergency intercom call boxes present in some Areas of Rescue Assistance (AORA).

The PLNT inspection interval for subway emergency exits is quarterly. The procedure for the inspection is PLNT Work Instruction 209-01, "Quarterly Emergency Shaft Inspection," and is used in conjunction with preventive maintenance inspection checklist PLNT Form 209-1604. The Maintenance Operations Center (MOC) personnel have "super-user" rights in MAXIMO and thus have the ability to open any type of service ticket, including those for fire-life safety (FLS) assets to all departments. PLNT Fire Technicians have been granted these same "super-user" rights so that they can open FLS MAXIMO tickets to all departments. By granting PLNT Fire Technicians the same MAXIMO "super-user" rights as MOC personnel, tickets can be opened in a more timely and detailed manner.

SAFE performs its own inspections of subway emergency egress and equipment independent of PLNT's inspections. PLNT receives SAFE's station inspection reports, which include reviews of subway emergency egress and equipment. TOC was advised that when WMATA removes an emergency exit hatch from service, this information is communicated to outside fire departments and first responder agencies, usually in a telephone call from the WMATA Fire Marshal with an explanation of the situation. Each jurisdiction has a Metro liaison officer, to whom this information is communicated. TOC was advised of this protocol but was unable to review the procedure supporting this protocol. See related Finding of CWR 6 below. Following major weather or natural disaster events, such as snowstorms and earthquakes, PLNT will follow the snow plan, which entails clearing snow from emergency exit hatches (if applicable), and then PLNT inspections of emergency egress shafts and equipment. For any emergency exits that are removed from service, PLNT will erect barriers and signs topside and at the roadway level to indicate that particular emergency exits are out of service. As of the issuance of this report, TOC was unable to review samples of SAFE's station emergency egress inspection reports, as well as the WMATA procedure for notifying first responder agencies of emergency egress hatches being removed from or restored to service and records of such notifications.

POWR does not have specific policies or procedures for inspecting emergency egress shafts. POWR relies on PLNT for reports of defects and responds to FLS work order tickets issued by PLNT through MAXIMO.

TOC reviewed preventative maintenance records, including Emergency Egress Inspection Reports and MAXIMO work orders, from PLNT and POWR for six months prior to the review (i.e. May through November 2014) from a selection of stations: Columbia Heights, Anacostia, Waterfront, Union Station, Bethesda, Friendship Heights, and Rosslyn.

TOC had a follow-up interview with IT to clarify the responsibilities for maintenance and inspection of telephone equipment in WMATA emergency egress areas. TOC inquired whether IT conducts regular inspections of telephones in Areas of Rescue Assistance and other emergency egress locations. IT stated that it performs twice-a-year inspections of Emergency Trip Station (ETS) phones only; telephones in emergency shafts are not subject to regularly scheduled maintenance activity. IT performs only corrective maintenance. Please see related Finding of NC-1 below. COMM has responsibility for maintaining the RAMEX system; the RAMEX system consists of the yellow emergency intercom call boxes that enable WMATA customers and personnel to communicate with Station Managers and the Rail Operations Control Center. IT provides only the dial tones for the RAMEX system.

The TOC performed field inspections of emergency egress shafts at the following stations: Columbia Heights, Waterfront, Union Station (shaft at D St. NW and New Jersey Ave. NW), Rosslyn, and Bethesda. Overall, conditions at all four facilities were good. Only a few issues were systemic or serious; those are described as findings later in this report. **For all other minor deficiencies that follow, TOC requests that WMATA not initiate a CAP but simply report action taken to correct the issue:**

Columbia Heights

- The Emergency Exit light above the exit door in the Track 1 Area of Rescue Assistance was not lit.
- The telephone in the Area of Rescue Assistance adjacent to Track 1 had no dial tone, and the emergency call box in the same Area of Rescue Assistance was not functional. As of the publication of this report, the TOC was unable to review maintenance records for the RAMEX system.

Bethesda

- Please see Finding of CWR 5 below.

Findings of Non-Compliance (NC)

Finding of NC 1: Telephones in Areas of Rescue Assistance (AORA) and in the shafts' landings are not subject to regularly scheduled inspections. IT performs only corrective maintenance of telephones in Areas of Rescue Assistance when

reported by other departments. Section 14.4 of the WMATA SSPP includes communications equipment as being subject to safety inspections.

Recommended Corrective Action: WMATA should develop and implement a telephone inspection schedule, procedure, and checklist for inspecting telephones in the AORA and egress shafts. To close this finding, WMATA should provide TOC with the inspection schedule and procedures for review.

Finding of NC 2: The emergency egress landing immediately off the inbound end of the Rosslyn upper-level platform was blocked by several (at least 20) large bags full of debris that prevented expeditious egress. The obstruction created by the debris bags constitutes non-compliance with MSRP Rule 4.62:

Designated walkways shall be kept clean and free of obstructions.

The Assistant Director of PLNT, who was accompanying the TOC review team, immediately reported the obstruction to the Director of PLNT, the General Superintendent of Systems Maintenance (SMNT), and the General Superintendent of Track and Structures (TRST). An immediate investigation ensued. PLNT subsequently stated that a contractor created the obstruction.

Recommended Corrective Action: Ensure that contractors are briefed on proper safety protocol and that WMATA personnel periodically inspect contractor work on WMATA property. To close this finding, WMATA should provide TOC with evidence that the debris bags were removed and that the contractor in this instance was re-trained on proper safety practices when working on WMATA property.

Finding of NC 3: PLNT Fire Technicians reported being concerned about the lack of a good process to ensure that SAFE becomes aware of safety issues that the PLNT Fire Technicians identify.

These concerns appear to indicate that there is the mechanism described in Section 5.4.1 of the 2014 WMATA SSPP, "Complaint Investigations," is not the current practice at WMATA.

Recommended Corrective Action: WMATA should develop and document a process to better ensure that fire-life safety issues related to subway emergency egress and equipment are documented and communicated to SAFE. This process should also be done in accordance with WMATA's hazard management process. TOC also recommends that QAAW take a more active role in audits of subway emergency egress and equipment. WMATA should submit documentation for such a process to TOC for review.

Finding of NC 4: Station Managers throughout the review did not seem to be consistently aware of procedures for response to intrusion detection alarms triggered by opening of the emergency egress hatches.

Some station managers were aware that the TOC review team was testing emergency egress hatches and thus were aware of what the concurrent intrusion detection alarms in their kiosks indicated, while others were unsure of how to respond to the alarms. The fact that Station Managers did not seem to be consistently aware of procedures for response to intrusion detection alarms triggered by opening of the emergency egress hatches appears to be inconsistent with Section 16.2 of the SSPP, "Employee Safety." Section 16.2 of the SSPP states that Station Managers are provided emergency response training.

Recommended corrective action: RTRA should review and clarify the Station Manager standard operating procedures and training materials pertaining to proper response procedures to intrusion detection alarms. WMATA should submit revised procedures and training materials to TOC for review.

Findings of Compliance with Recommendation (CWR)

Finding of CWR 1: PLNT does not have formal procedures in place such that, following emergency events, PLNT inspects the equipment used during the event, such as ETECs, emergency egress doors and hatches, and other related equipment to ensure that equipment is stored properly and any defects and restoration necessary due to the event have been addressed. For example, PLNT should ensure that ETECs are properly stored, egress doors and hatches are not damaged, and any other remaining equipment are stored or replaced, as appropriate. Instituting such inspections will help ensure that emergency egress equipment is properly in place in preparation for the next event.

Recommended corrective action: PLNT should implement a procedure to direct its staff to inspect and restore the equipment used during such an event as described above within a given time period following an event, perhaps within 72 hours. WMATA should submit this procedure to TOC for review.

Finding of CWR 2: PLNT does not have a procedure, separate from the dry standpipe testing procedure, to ensure that dry standpipes are dry after use in testing or an emergency event. Such a procedure will prevent any remaining water from freezing or otherwise damaging the pipes. The TOC received and reviewed the dry standpipe testing procedure in advance of this review.

Recommended corrective action: PLNT should develop a procedure for draining dry standpipes after use, such as testing or an emergency event. PLNT should submit this procedure to TOC for review.

Finding of CWR 3: WMATA does not have an easily-accessible, easily-usable inventory of all fire/life safety assets throughout the Metrorail system. Such an

inventory would enable anyone within the Authority to easily see the scheduled inspection interval and last inspection date for any asset queried.

Recommended corrective action: WMATA should develop such an inventory, perhaps with Microsoft Excel, Microsoft Access, or other user-friendly format. WMATA should submit a sample inventory to TOC for review.

Finding of CWR 4: WMATA does not have in writing its protocol for formally notifying local first responder agencies of emergency egress hatches and doors being removed or put back into service. In the event that WMATA removes emergency egress hatches or doors from service or returns them to service, the WMATA Fire Marshal notifies local first responder agencies of such outages or returns to service, typically with a telephone call to the agency's Metro Liaison. This practice facilitates local first responders being up-to-date about the current status of emergency egress hatches or doors being in or out of service. The TOC was unable to review a written procedure for this practice, however. By codifying this practice in a written procedure, WMATA can ensure that the institutional knowledge of this practice is maintained through WMATA personnel changes.

Recommended corrective action: WMATA should document in writing its existing process of notifying local first responder agencies of emergency egress doors or hatches being removed from or returned to service. WMATA should also log such correspondence or communication between WMATA and first responders to document such communication having taken place. To close this finding, WMATA should submit this written procedure to TOC for review.

Finding of CWR 5: The TOC review team observed a large diesel generator at Bethesda adjacent to the roadway, in an Area of Rescue Assistance. WMATA personnel accompanying the TOC review team were unsure of why the generator was present and for what purpose. The TOC requests that WMATA provide verification of removal of the generator. While diesel generators are allowed in underground Metrorail facilities, according to the WMATA Construction Safety and Environmental Manual, the presence of a diesel generator can emit noxious fumes in a closed environment. (Note: WMATA reported in its response to the draft report for this review that TRST removed the observed generator and PLNT confirmed the generator's removal.)

Recommended corrective action: WMATA should provide TOC with the circumstances of the generator being present by the roadway at Bethesda and evidence that the generator was removed.

Persons Interviewed

- [REDACTED]
- [REDACTED] Communications

- [REDACTED] Plant Maintenance
- [REDACTED] Power
- [REDACTED] Information Technology
- [REDACTED] Information Technology

WMATA Audit Observers

- [REDACTED] Quality Assurance and Warranty
- [REDACTED] Quality Assurance and Warranty
- [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] Quality Assurance and Warranty

Documents Reviewed

- Egress Hatch Manual
- PLNT Form 209-10: Master Emergency Egress Inspection
- PLNT Work Instruction 209-01: Emergency Egress Shaft Inspection
- PLNT Form 209-03: Master ETEC Inspection
- PLNT Work Instruction 209-03: ETEC Inspection
- PLNT Form 209-Five-Year-Standpipe Test
- Silver Line Tunnel Fan Controls O&M Manual, Books 1 and 2
- Preventive Maintenance Inspection for Fan Shaft Power Systems: Lighting, Automatic Transfer Switches, Voltage Regulators and Motor Control Centers, 364 Day Inspection
- O&M Manual Western Tunnel Fans
- Silver Line Tunnel O&M Manual
- Tunnel Fans and Jet Fan Vent Shaft Dampers Annual PM 209-1572-2014
- Tunnel Fans and Jet Fan Vent Shaft Dampers Monthly PM 209-1571-2014
- Tysons Tunnel Vent Annual PM 209-5640-2014
- Tysons Tunnel Vent Monthly PM 209-5634-2014
- QAAW Audit Report for Tunnel Fans and Vent Shaft Dampers, June 2014
- Completed Emergency Egress Inspection Reports (checklists) for Mt. Vernon Sq., Columbia Heights, Georgia Ave.-Petworth: March, June, and September 2014
- Completed Emergency Egress Inspection Reports (checklists) for Union Station, and Forest Glen: March, June, and September 2014
- Completed Emergency Egress Inspection Reports (checklists) for Navy Yard, Anacostia, Archives, L'Enfant Plaza, Waterfront: March, June, and September 2014
- Completed Emergency Egress Inspection Reports (checklists) for Foggy Bottom, Rosslyn, Arlington Cemetery, Pentagon, Pentagon City: March, June, and September 2014
- Completed Emergency Egress Inspection Reports (checklists) for Bethesda, Medical Center, and Forest Glen: March, June, and September 2014

- Completed Emergency Egress Inspection Reports (checklists) for Friendship Heights and Bethesda: March, June, and September 2014