Corrective Action Plans

Metrorail Category 5:
Fire/Life Safety and Emergency Preparedness
(2 Findings and 7 Required Actions)
Federal Transit Administration (FTA)
Safety Management Inspection (SMI)
MAR 16 – APR 3 2015

Washington Metropolitan Area Transit Authority (WMATA)
Corrective Action Plan (CAP)

R-5-34-a

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<tr>
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<th>Issue Date</th>
<th>Prepared By</th>
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<tr>
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<td>09/11/15</td>
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1 Background
The Federal Transit Administration (FTA) completed a Safety Management Inspection (SMI) of the Washington Metropolitan Area Transit Authority (WMATA) rail and bus systems. FTA issued Safety Directive 15-1 identifying 54 safety findings and 91 required actions to improve safety.

2 Purpose
This Corrective Action Plan has been developed to address Safety Finding No. R-34 and its Required Action R-34-a.

2.1 FTA Finding
Priority maintenance work for Fire/Life Safety (FLS) systems and other critical infrastructure with shared departmental responsibilities for inspection and maintenance is not completed as required.

2.2 FTA Required Action
WMATA must complete its “Fire/Life Safety 1000” maintenance procedure, to clarify roles and responsibilities, and outline expectations regarding how departments should work together to coordinate inspection, maintenance and repair of these system components.

3 Analysis and Recommendation

3.1 Analysis
The aging system that is currently in constant use requires repairs and maintenance on a daily basis. Metro’s Office of Plant Maintenance (PLNT)-1000 manual will address these maintenance issues and concerns. The Rail Operations Control Center (ROCC) will be involved in this process in order to allow maximum access to the right of way in order to repair system components.
3.2 Recommendation

The recommended course of action to address this deficiency is to work with all stakeholder departments to properly plan required maintenance activities that maximize work potential during scheduled and non-scheduled outages. The guidance from the Deputy General Manager of Operations (DGMO) office is to conduct as much maintenance as possible during the outages in order to take advantage of the system downtime.

4 Action Plan Description

Under this CAP, ROCC will work with members of the Office of Emergency Management (OEM), PLNT and Transit Infrastructure Engineering Service (TIES) in order to figure out ways to maximize the amount of work being done during non-revenue service hours. Additionally, ROCC will take a proactive approach to identifying the work that will be occurring and ensuring ROCC personnel are prepared to authorize track work at the appropriate times (i.e. being prepared for early out requests).

4.1 Approach

In addition to the weekly track rights meetings, ROCC will establish lines of communication to talk to supervisors and project managers in charge of requested work orders to ensure the Control Center is able to fully support the operations. ROCC management will ensure all requested track rights work personnel are briefed during shift changes in order to maximize situational awareness for the night shift. All sections that have a pertinent role in this process will coordinate amongst each other. The departments that will participate will include RTRA, OEM, SMNT (ATC, POWR, COMM), IT, TIES, and PLNT. Departments will develop procedures to ensure work orders generated on ventilation system components will be prioritized for completion and will be tracked through a discrepancy list. This process will be included as part of the PLNT-1000 manual.
<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Description</th>
<th>Responsible Party</th>
<th>Estimated Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>4)</td>
<td>PLNT 1000 Instructions for Testing and Inspection Procedures</td>
<td>Critical Fire and Life Safety testing and inspection procedures for Tunnel Ventilation System</td>
<td>Lou Viner, Kevin Borek, Nicholas Croce, Paul Kram, David Newman</td>
</tr>
<tr>
<td>5)</td>
<td>Meeting minutes</td>
<td>Agendas or meeting minutes that detail discussions on the development of the PLNT 1000 manual.</td>
<td>Lou Viner, Kevin Borek, Nicholas Croce, Paul Kram, David Newman</td>
</tr>
<tr>
<td>6)</td>
<td>Plan for implementation</td>
<td>Roll out plan for implementation and distribution of PLNT 1000 plan to employees</td>
<td>Lou Viner, Kevin Borek, Nicholas Croce, Paul Kram, David Newman</td>
</tr>
<tr>
<td>7)</td>
<td>Policy Audit</td>
<td>Audit Schedule of PLNT 1000 Instructions for Testing and Inspection Procedures</td>
<td>Lou Viner, Kevin Borek, Nicholas Croce, Paul Kram, David Newman, Michael DiNatale</td>
</tr>
<tr>
<td>8)</td>
<td>Quality Audit Report</td>
<td>The Office of Quality Assurance &amp; Warranty (QAAW) performs scope verification and inspection of CAP deliverables to ensure that all are completed as planned and expected.</td>
<td>Lou Viner, Kevin Borek, Nicholas Croce, Paul Kram, David Newman, Michael DiNatale</td>
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**Revision**

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4.2 Schedule

<table>
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<tr>
<th>Tasks</th>
<th>Estimated Start</th>
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<tbody>
<tr>
<td>Coordinate with Maintenance Operations Control (MOC), PLNT, Engineering, TIES</td>
<td>07/15/15</td>
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</tr>
<tr>
<td>Incorporate track rights reviews into shift brief</td>
<td>07/31/15</td>
<td>12/31/15</td>
</tr>
<tr>
<td>Finalize Fire/Life Safety 1000 plan</td>
<td>07/31/15</td>
<td>12/31/15</td>
</tr>
<tr>
<td>Tunnel Fan Process Diagram</td>
<td>07/08/15</td>
<td>04/29/16</td>
</tr>
<tr>
<td>UPE Fan Process Diagram</td>
<td>08/20/15</td>
<td>04/29/16</td>
</tr>
<tr>
<td>Dome Fan Process Diagram</td>
<td>08/20/15</td>
<td>04/29/16</td>
</tr>
<tr>
<td>Develop Instructions for Testing and Inspection Procedures for End to End Elements of the Ventilation System.</td>
<td>07/09/15</td>
<td>05/09/16</td>
</tr>
<tr>
<td>Updated Instructions for Testing and Inspection Procedures to QAAW</td>
<td>04/08/16</td>
<td>05/09/16</td>
</tr>
<tr>
<td>QAAW will also perform scope verification and inspection of deliverables</td>
<td>05/09/16</td>
<td>05/23/16</td>
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</tbody>
</table>

4.3 Budget / Cost Estimate

This action will be funded in the operating budget in FY2016. Additional operating funds will be required in future fiscal years to complete this action.
4.4 Internal Stakeholders

The following internal stakeholders are committed to work on this action plan.

<table>
<thead>
<tr>
<th>Participant</th>
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<tr>
<td>ROCC</td>
<td>Tiffani Jenkins</td>
<td>TJ</td>
<td>Track rights requests</td>
<td>Robert Relyea</td>
<td>08/31/15</td>
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<td>CENI</td>
<td>Lou Viner</td>
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<td>Robert Relyea</td>
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<tr>
<td>PLNT</td>
<td>Paul Kram</td>
<td>PK</td>
<td>Track rights requests/Track access time</td>
<td>Robert Relyea</td>
<td>08/31/15</td>
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<tr>
<td>TIES</td>
<td>Andrew Off</td>
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<td>08/31/15</td>
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<td>ROCC</td>
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<td>TJ</td>
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<tr>
<td>QAAW</td>
<td>Michael DiNatale</td>
<td>M</td>
<td>CAP deliverables verified and reviewed</td>
<td>Gregory Wortman</td>
<td>05/23/16</td>
</tr>
</tbody>
</table>

5 CAP Completion Documentation

After Metro’s collective review, a memorandum with enclosed CAP deliverables (refer to 4.1) will be provided to FTA to support the closure of this required action.

6 Performance Measures

Reduction in time required for corrective action to be completed on work orders related to the tunnel ventilation system and results of QAAW audits.

7 Verification

Review of diagrams, PLNT-1000 manual, roll-out and field implementation plans, audit reports, and field observations/interviews.

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</table>
8 CAP Approval

APPROVED BY:

Action Coordinator
Gregory Wortman
Assistant Director of Rail Operations Control Center (ROCC)

Department Head
Hercules Ballard
Managing Director of Rail Transportation (RTRA)

Andrew Off
Assistant General Manager
Transit Infrastructure and Engineering Services (TIES)

A. Robert Troup
Deputy General Manager, Operations (DGMO)

Louis J. Brown
Acting Chief Safety Officer (SAFE)

Jack Requa
Interim General Manager/Chief Executive Officer (GM/CEO)

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Federal Transit Administration (FTA)
Safety Management Inspection (SMI)
MAR 16 – APR 3 2015

Washington Metropolitan Area Transit Authority (WMATA)
Corrective Action Plan (CAP)

R-5-35-a

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1 Background

The Federal Transit Administration (FTA) completed a Safety Management Inspection (SMI) of the Washington Metropolitan Area Transit Authority (WMATA) rail and bus systems. FTA issued Safety Directive 15-1 identifying 54 safety findings and 91 required actions to improve safety.

2 Purpose

This Corrective Action Plan has been developed to address Safety Finding No. R-35 and its Required Action R-5-35-a.

2.1 FTA Finding

Metro must do more to prevent and manage conditions that cause smoke in the tunnel.

2.2 FTA Required Action

Metro must establish clear definitions for infrastructure conditions requiring immediate or emergency action, such as “arcing insulator.”

3 Analysis and Recommendation

3.1 Analysis

Metro is in the process of finalizing the Metro PLNT 1000 plan that will help identify conditions that could result in emergencies. Metro does not have a system in which competing resources and manpower are allocated based off of highest priority. In this required action, FTA directs WMATA to establish clear definitions for infrastructure conditions requiring immediate or emergency action, such as “arcing insulator.” WMATA must clarify where these definitions will be provided for frontline personnel and how they will be used to support the identification and management of deficient conditions.

3.2 Recommendation

The recommended course of action to address this deficiency is to develop a hierarchy of response based off of the severity of the incident in question.
4 Action Plan Description

Metro is in the process of developing a list of competing demands that will be prioritized based off of the safety of the riders and the needs of the system. This list will prioritize work requirements, infrastructure improvement, and levels of response to various incidents that will occur within the system.

4.1 Approach

Metro will ensure that the Rail Operation Control Center (ROCC) will work with the department of Transit Infrastructure and Engineering Services (TIES), Engineering (ENG), and the Office of Emergency Management (OEM) to develop the list that will be utilized to centralize response actions and allocate resources based off of a hierarchical design of necessity.

<table>
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<tr>
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<th>Description</th>
<th>Responsible Party</th>
<th>Estimated Completion Date</th>
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<tbody>
<tr>
<td>1) List of issues requiring emergency action</td>
<td>A comprehensive list that details items requiring immediate action and resources and clearly defines actions to take upon discovering the issue.</td>
<td>Robert Relyea, Andrew Off, Ronald Bodmer, Lou Viner</td>
<td>08/31/15</td>
</tr>
<tr>
<td>2) Narrative memo</td>
<td>A narrative explanation regarding how the list of conditions requiring immediate action will be documented and communicated to the frontline and supervisory personnel for implementation into the field</td>
<td>Robert Relyea, Andrew Off, Ronald Bodmer, Lou Viner</td>
<td>12/31/15</td>
</tr>
<tr>
<td>3) Quarterly report</td>
<td>A QAAW quarterly review of work orders and radio reports to assess employee actions in reporting and managing conditions requiring immediate actions</td>
<td>Michael DiNatale</td>
<td>Recurring</td>
</tr>
<tr>
<td>4) Quality Audit Report</td>
<td>The Office of Quality Assurance &amp; Warranty (QAAW) performs scope verification and inspection of CAP deliverables to ensure that all are completed as planned and expected.</td>
<td>Michael DiNatale</td>
<td>07/31/16</td>
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4.2 Schedule

<table>
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<tr>
<th>Tasks</th>
<th>Estimated Start</th>
<th>Estimated Finish</th>
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</thead>
<tbody>
<tr>
<td>Coordinate with MOC, PLNT, CENI, TIES</td>
<td>07/15/15</td>
<td>07/31/15</td>
</tr>
<tr>
<td>Development of checklist with items defined</td>
<td>07/31/15</td>
<td>08/31/15</td>
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</table>
4.3 Budget / Cost Estimate

This action will be funded in the operating budget in FY2016. Additional operating funds will be required in future fiscal years to complete this action.

4.4 Internal Stakeholders

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<tr>
<td>ROCC</td>
<td>Tiffani Jenkins</td>
<td>TJ</td>
<td>List of equipment with issues that affect safety and daily operations</td>
<td>Robert Relyea</td>
<td>07/31/15</td>
</tr>
<tr>
<td>TIES</td>
<td>Andrew Off</td>
<td>AW</td>
<td>List of equipment with issues that affect safety and daily operations</td>
<td>Robert Relyea</td>
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<td>Paul Kram</td>
<td>PoK</td>
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<td>Robert Relyea</td>
<td>07/31/15</td>
</tr>
<tr>
<td>QAAW</td>
<td>Michael DiNatale</td>
<td>W</td>
<td>CAP deliverables verified and reviewed</td>
<td>Gregory Wortman</td>
<td>07/31/16</td>
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</tbody>
</table>

5 CAP Completion Documentation

After Metro’s collective review, a memorandum with enclosed CAP deliverables (refer to 4.1) will be provided to FTA to support the closure of this required action.

6 Performance Measures

Improved levels of compliance reported by QAAW and supervisors regarding the identification and management of conditions that require immediate action, such as “arcing insulators.”

7 Verification

Document review, QAAW reports, interviews, and field observations.
8 CAP Approval

APPROVED BY:

Action Coordinator
Gregory Wortman
Assistant Director of Rail Operations Control Center (ROCC)

Department Head
Hercules Ballard
Managing Director of Rail Transportation (RTRA)

Andrew Off
Assistant General Manager
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Federal Transit Administration (FTA)
Safety Management Inspection (SMI)
MAR 16 – APR 3 2015

Washington Metropolitan Area Transit Authority
Corrective Action Plan (CAP)

R-5-35-b
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6 PERFORMANCE MEASURES ............................................................................................................... 6
7 VERIFICATION ................................................................................................................................... 6
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1 Background

The Federal Transit Administration (FTA) completed a Safety Management Inspection (SMI) of the Washington Metropolitan Area Transit Authority (WMATA) rail and bus systems. FTA issued Safety Directive 15-1 identifying 54 safety findings and 91 required actions to improve safety.

2 Purpose

This Corrective Action Plan has been developed to address Safety Finding No. R-35 and its Required Action R-5-35-b.

2.1 FTA Finding

WMATA must do more to prevent and manage conditions that cause smoke in the tunnel.

2.2 FTA Required Action

WMATA must address third rail insulator cleaning and replacement requirements and third rail jumper cable inspection and replacement requirements as part of the “FLS 1000” procedure, or in separate but referenced procedures.

3 Analysis and Recommendation

3.1 Analysis

Metro is in the process of finalizing the Metro TRST 2000 and Power 1000 plans that will help identify conditions that could result in emergencies. Metro agrees that a proactive approach must be taken to address the concerns of an aging system that could result in emergency situations.

3.2 Recommendation

The recommended course of action to address this deficiency is to develop a proactive and aggressive maintenance schedule that attempts to address as many deficiencies as possible during the scheduled track work.
4 Action Plan Description

Metro is identifying historical problem areas and known equipment issues in order to develop a pro-active maintenance plan. In an effort to become proactive, the Deputy General Manager of Operations (DGMO) has directed the cleaning of insulators during non-revenue maintenance periods. This is an aggressive plan that was a prior best-practice at Metro and is being incorporated to reduce the amount of insulator issues within the system. Additionally, the DGMO has directed an aggressive inspection of all third rail cables and insulator sleeves to address the issue of particulates getting inside of the cables and causing the arcing events.

Metro is currently in the process of conducting cable insulation inspections and replacements. The inspection also includes checking and replacing insulator sleeves in order to come into compliance with engineering assessments that were originally included during installation and addressed in the latest National Transportation Safety Board (NTSB) investigation.

4.1 Approach

Aggressive and proactive maintenance schedules have already been implemented due to recent guidance given by the office of the DGMO. Rail Operations Control Center (ROCC) will continue to work with elements of Maintenance Operations Control (MOC), Office of Plant Maintenance (PLNT), Transit Infrastructure and Engineering Services (TIES), and Engineering to ensure proper track rights are allocated to conduct work requested in the FTA findings.
### Corrective Action Plan (CAP)

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Description</th>
<th>Responsible Party</th>
<th>Estimated Completion Date</th>
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</thead>
<tbody>
<tr>
<td>1) Report of daily review of work requests</td>
<td>Utilize current systems to review upcoming track work requests</td>
<td>Robert Relyea</td>
<td>08/31/15</td>
</tr>
<tr>
<td>2) Report of completion of TRST 2000 and Power 1000</td>
<td>Completion of the Metro TRST 2000 and Power 1000 plans</td>
<td>Tiffany Jenkins, Andrew Off</td>
<td>12/31/15</td>
</tr>
<tr>
<td>3) Management directive</td>
<td>A management directive that details the plan for the cleaning of the insulators</td>
<td>Andrew Off</td>
<td>12/31/15</td>
</tr>
<tr>
<td>4) Quarterly Report of replacement of insulator cables</td>
<td>Replacement of faulty insulator cables and protective sleeves as identified in engineer assessments</td>
<td>Andrew Off</td>
<td>Recurring</td>
</tr>
<tr>
<td>5) Compliance reviews</td>
<td>Revised procedures that support the ongoing compliance reviews from QAAW to ensure this aggressive plan is implemented</td>
<td>Andrew Off, Michael DiNatale</td>
<td>12/31/15</td>
</tr>
<tr>
<td>4) Quality Audit Report</td>
<td>The Office of Quality Assurance &amp; Warranty (QAAW) performs scope verification and inspection of CAP deliverables to ensure that all are completed as planned and expected.</td>
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<td>Incorporate track rights reviews into shift brief</td>
<td>07/31/15</td>
<td>12/31/15</td>
</tr>
<tr>
<td>Finalize TRST 2000 and Power 1000</td>
<td>07/31/15</td>
<td>12/31/15</td>
</tr>
<tr>
<td>Complete installation of insulator protective sleeves</td>
<td>06/01/15</td>
<td>12/31/16</td>
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#### 4.3 Budget / Cost Estimate

This action will be funded in the operating budget in FY2016. Additional operating funds will be required in future fiscal years to complete this action.
4.4 Internal Stakeholders

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<td>12/31/16</td>
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5 CAP Completion Documentation

After Metro's collective review, a memorandum with enclosed CAP deliverables (refer to 4.1) will be provided to FTA to support the closure of this required action.

6 Performance Measures

Percentage completion of replacement of faulty insulator cables and protective sleeves.
Reduction in arcing insulators and reported smoke conditions.

7 Verification

Review TRST 2000 and PLNT 1000, records review in MAXIMO, and field observations.
# 8 CAP Approval

**APPROVED BY:**

<table>
<thead>
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## Revision Log

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412
Federal Transit Administration (FTA)  
Safety Management Inspection (SMI)  
MAR 16 – APR 3 2015

Washington Metropolitan Area Transit Authority  
Corrective Action Plan (CAP)  

R-5-35-c

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1 Background
The Federal Transit Administration (FTA) completed a Safety Management Inspection (SMI) of the Washington Metropolitan Area Transit Authority (WMATA) rail and bus systems. FTA issued Safety Directive 15-1 identifying 54 safety findings and 91 required actions to improve safety.

2 Purpose
This Corrective Action Plan has been developed to address Safety Finding No. R-35 and its Required Action R-5-35-c.

2.1 FTA Finding
WMATA must do more to prevent and manage conditions that cause smoke in the tunnel.

2.2 FTA Required Action
WMATA must improve its ability to detect the location of smoke in its tunnel network.

3 Analysis and Recommendation

3.1 Analysis
The current system does not allow for detection of smoke within the tunnels. Smoke can be detected at the stations, in the trains, and in the ventilation systems; however, no suitable equipment can be found that can operate effectively within the tunnel system for smoke detection.

3.2 Recommendation
The recommended course of action to address this deficiency is to continue to identify possible outside solutions for smoke detection within the tunnels.

4 Action Plan Description
The issue in the identification and handling of smoke incidents was addressed at a meeting on June 24, 2015 and July 8, 2015 between members of the Engineering department, ROCC and the Consultant - AECOM. AECOM is in the process of conducting an evaluation on SOP response to smoke within the tunnel system and the overall functionality of the ventilation system. One of the topics to be looked at is smoke detection and what technology is currently available that would be able to perform within our system.
4.1 Approach
Metro will continue to be proactive in the search for a solution to this problem. Until a solution can be found, Metro will continue to utilize all resources available (station smoke detectors, ventilation detection devices, and train operators) to quickly respond to a notification of smoke within the tunnel.

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<td>List of vendor solutions to smoke detection</td>
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<td>3)</td>
<td>Report of AECOM findings</td>
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<td>4)</td>
<td>Action plan</td>
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<td>5)</td>
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4.2 Schedule

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<td>Development of SOP for reporting of smoke incidents</td>
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<td>Development of SOP for tunnel ventilation operations</td>
<td>6/28/15</td>
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<tr>
<td>Develop list of vendor solutions</td>
<td>6/28/15</td>
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4.3 Budget / Cost Estimate
This action will be funded in the operating budget in FY2016. Additional operating funds will be required in future fiscal years to complete this action.
4.4 Internal Stakeholders

The following internal stakeholders are committed to work on the action plan.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Needed From</th>
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5 CAP Completion Documentation

After Metro’s collective review, a memorandum with enclosed CAP deliverables (refer to 4.1) will be provided to FTA to support the closure of this required action.

6 Performance Measures

Evaluation and testing results from pilot program for smoke detection equipment and improved accuracy in reporting the location of smoke events.

7 Verification

Review reports, SOP, and the results of the pilot test.
8 CAP Approval

APPROVED BY:

Signature
09/10/15

Action Coordinator
Gregory Wortman
Assistant Director of Rail Operations Control Center (ROCC)

Signature
9/10/15

Date

Department Head
Hercules Ballard
Managing Director of Rail Transportation (RTRA)

Signature
10 SEP 15

Date

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Signature
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Jack Requa
Interim General Manager/Chief Executive Officer (GM/CEO)

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Federal Transit Administration (FTA)
Safety Management Inspection (SMI)
MAR 16 – APR 3 2015

Washington Metropolitan Area Transit Authority (WMATA)
Corrective Action Plan (CAP)
R-5-35-d
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7 VERIFICATION ....................................................................................................................................... 5
8 CAP APPROVAL ................................................................................................................................... 6
1 Background

The Federal Transit Administration (FTA) completed a Safety Management Inspection (SMI) of the Washington Metropolitan Area Transit Authority (WMATA) rail and bus systems. FTA issued Safety Directive 15-1 identifying 54 safety findings and 91 required actions to improve safety.

2 Purpose

This Corrective Action Plan has been developed to address Safety Finding No. R-35 and its Required Action R-5-35-d.

2.1 FTA Finding

Metro must do more to prevent and manage conditions that cause smoke in the tunnel.

2.2 FTA Required Action

Metro must resume its program for cable insulation resistance testing for its power cables. Insulation resistance testing should be performed on power cables every 10 years.

3 Analysis and Recommendation

3.1 Analysis

The resistance testing for power cables needs to be scheduled and coordinated for according to the lifecycle of the equipment.

3.2 Recommendation

The recommended course of action to address this deficiency is to develop a proactive and aggressive maintenance schedule to rectify all deficiencies and bring the system into compliance. Records need to be reviewed to identify which cables require testing. If records have not been maintained, all cables need to begin being tested and documented.
4 Action Plan Description

Metro is currently in the process of conducting cable insulation inspections and replacements. The inspection also includes checking and replacing insulator sleeves in order to come into compliance with engineering assessments that were originally included during installation and addressed in the latest National Transportation Safety Board (NTSB) investigation.

4.1 Approach

The guidance from the Office of the Deputy General Manager of Operations (DGMO) is to thoroughly and efficiently inspect all cables and insulator sleeves to ensure they are in compliance with the original engineering specifications. The approach to accomplish this is to maximize work crews in multiple locations to build a baseline on equipment that needs to be replaced or repaired. Once inspected, detailed reports and records need to be maintained in order to remain proactive. A database needs to be developed that issues a 30-60-90 day warning on when cables and insulators are going to fall into a non-compliance category.

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<td>Andrew Off</td>
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<td>The detailed plan regarding all aspects of power</td>
<td>Tiffani Jenkings</td>
<td>12/31/15</td>
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<td>3) QAAW audits</td>
<td>Policy letter stating that all inspections have been conducted for insulators</td>
<td>Michael DiNatale</td>
<td>01/07/17</td>
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<td>4) Quality Audit Report</td>
<td>The Office of Quality Assurance &amp; Warranty (QAAW) performs scope verification and inspection of CAP deliverables to ensure that all are completed as planned and expected.</td>
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4.2 Schedule

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<td>Generate insulator testing reports</td>
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<td>Complete installation of insulator protective sleeves</td>
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4.3 Budget / Cost Estimate

N/I (No Impact).

4.4 Internal Stakeholders

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5 CAP Completion Documentation

After Metro’s collective review, a memorandum with enclosed CAP deliverables (refer to 4.1) will be provided to FTA to support the closure of this required action.

6 Performance Measures

Percentage completion of inspections and non-compliance reports issued by QAAW.

7 Verification

Review of reports, SOPs and manuals, interviews, and field observations.
8 CAP Approval

APPROVED BY:

[Signature]
09/10/15

Action Coordinator
Gregory Wortman
Assistant Director of Rail Operations Control Center (ROCC)

Department Head
Hercules Ballard
Managing Director of Rail Transportation (RTRA)

[Signature]
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[Signature]
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Federal Transit Administration (FTA)
Safety Management Inspection (SMI)
MAR 16 – APR 3 2015

Washington Metropolitan Area Transit Authority (WMATA)
Corrective Action Plan (CAP)
R-5-35-e
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2 Purpose
This Corrective Action Plan has been developed to address Safety Finding No. R-35 and its Required Action R-5-35-e.

2.1 FTA Finding
Metro must do more to prevent and manage conditions that cause smoke in the tunnel.

2.2 FTA Required Action
Metro must replace all defective power cables that have been identified by traction power inspectors and maintainers.

3 Analysis and Recommendation

3.1 Analysis
Metro has been made aware of defective power cables due to the lack of a properly installed insulating sleeves on multiple power connectors.

3.2 Recommendation
The recommended course of action to address this deficiency is to finish inspecting all power cables and insulator sleeves and to make the necessary corrections as they are discovered.

4 Action Plan Description
Metro is in currently in the process of conducting cable insulation inspections and replacements. The inspection also includes checking and replacing insulator sleeves in order to come into compliance with engineering assessments that were originally included during installation and addressed in the latest National Transportation Safety Board (NTSB) investigation.
4.1 Approach

Every attempt will be made during daily and nightly maintenance activities to identify and replace defective power cables that are identified by traction power inspectors and maintainers. Upon notification or identification of a defective cable, work crews will immediately fix the issue and report the status of the power cable. During inspections, cables that are found without the proper insulating sleeves will receive a priority status for replacement.

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<td>Replacement of faulty insulator cables and protective sleeves as identified in engineer assessments</td>
<td>Andrew Off</td>
<td>12/31/16</td>
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<td>2) Quality Audit Report</td>
<td>The Office of Quality Assurance &amp; Warranty (QAAW) performs scope verification and inspection of CAP deliverables to ensure that all are completed as planned and expected</td>
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4.3 Budget / Cost Estimate

N/I (No Impact).
4.4 Internal Stakeholders

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<td>Robert Relyea</td>
<td>08/31/15</td>
</tr>
<tr>
<td>DGMO</td>
<td>Andrew Off</td>
<td>AR</td>
<td>Report on defective cables/boots</td>
<td>Rob Troup</td>
<td>12/31/16</td>
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<tr>
<td>QAAW</td>
<td>Michael DiNatale</td>
<td>NT</td>
<td>CAP deliverables verified and reviewed</td>
<td>Gregory Wortman</td>
<td>01/07/17</td>
</tr>
</tbody>
</table>

5 CAP Completion Documentation

After Metro's collective review, a memorandum with enclosed CAP deliverables (refer to 4.1) will be provided to FTA to support the closure of this required action.

6 Performance Measures

Percentage completion of replacements and non-compliance reports issued by QAAW.

7 Verification

Records reviews, MAXIMO reports, interviews, and field observations.
8 CAP Approval

APPROVED BY:

[Signature]
09/10/15

Action Coordinator
Gregory Wortman
Assistant Director of Rail Operations Control Center (ROCC)

[Signature] For Hercules Ballard
9/10/15

Department Head
Hercules Ballard
Managing Director of Rail Transportation (RTRA)

[Signature]
16 Sep 15

Andrew Off
Assistant General Manager
Transit Infrastructure and Engineering Services (TIES)

[Signature]
9/10/2015

A. Robert Troup
Deputy General Manager, Operations (DGMO)

[Signature] For Louis Brown
9/10/15

Louis J. Brown
Acting Chief Safety Officer (SAFE)

[Signature]
9/11/15

Jack Requa
Interim General Manager/Chief Executive Officer (GM/CEO)

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<td>09/11/15</td>
<td>WMATA</td>
<td>FTA</td>
<td>6 of 6</td>
</tr>
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</table>
Federal Transit Administration (FTA)
Safety Management Inspection (SMI)
MAR 16 – APR 3 2015

Washington Metropolitan Area Transit Authority (WMATA)
Corrective Action Plan (CAP)

R-5-35-f
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1 Background
The Federal Transit Administration (FTA) completed a Safety Management Inspection (SMI) of the Washington Metropolitan Area Transit Authority (WMATA) rail and bus systems. FTA issued Safety Directive 15-1 identifying 54 safety findings and 91 required actions to improve safety.

2 Purpose
This Corrective Action Plan has been developed to address Safety Finding No. R-35 and its Required Action R-5-35-f.

2.1 FTA Finding
Metro must do more to prevent and manage conditions that cause smoke in the tunnel.

2.2 FTA Required Action
Metro must set a schedule of drills to assess the effectiveness of Metro’s response to smoke in tunnel and station conditions.

3 Analysis and Recommendation

3.1 Analysis
Emergency drills had not been conducted in the past with all supporting jurisdictions in order to develop integrated operations.

3.2 Recommendation
The recommended course of action to address this deficiency is to develop training exercises that will be utilized to gauge proficiency during emergency response situations.

4 Action Plan Description
Rail Operation Control Center (ROCC) and the Office of Emergency Management (OEM) have established a preliminary schedule for the next 3 years that incorporates all emergency services from the jurisdictions within Metro boundaries. The drills that have been scheduled alternate between counties and districts in order to allow all emergency services the chance to participate.
One drill was conducted at Greenbelt station in May 2015 and the second drill is scheduled for August 2015 between Stadium Armory and Potomac Avenue.

4.1 Approach

Metro will ensure that the ROCC will continue to work with OEM to plan and execute quarterly training scenarios that involve all jurisdictions that are stakeholders within the railroad system. These scenarios will focus on historic problems and emergencies that are encountered within the rail system.

<table>
<thead>
<tr>
<th>Deliverable</th>
<th>Description</th>
<th>Responsible Party</th>
<th>Estimated Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Emergency training exercise</td>
<td>List of all quarterly training exercises that will be conducted for the next three years</td>
<td>Robert Relyea, Ronald Bodmer</td>
<td>08/31/15</td>
</tr>
<tr>
<td>2) After action reports</td>
<td>Provide one year’s worth of after action reports to FTA</td>
<td>Robert Relyea, Ronald Bodmer</td>
<td>12/31/16</td>
</tr>
<tr>
<td>3) After action report tracker</td>
<td>A tracker that identifies corrective actions and the status on recommended changes</td>
<td>Robert Relyea, Ronald Bodmer</td>
<td>12/31/16</td>
</tr>
<tr>
<td>4) Quality Audit Report</td>
<td>The Office of Quality Assurance &amp; Warranty (QAAW) performs scope verification and inspection of CAP deliverables to ensure that all are completed as planned and expected.</td>
<td>Michael DiNatale</td>
<td>12/31/16</td>
</tr>
</tbody>
</table>

4.2 Schedule

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Estimated Start</th>
<th>Estimated Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of quarterly emergency training exercises</td>
<td>06/01/15</td>
<td>08/31/15</td>
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</table>

4.3 Budget / Cost Estimate

This action will be funded in the operating budget in FY2016. Additional operating funds will be required in future fiscal years to complete this action.
4.4 Internal Stakeholders

The following internal stakeholders are committed to work on the action plan.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Required From</th>
<th>Required</th>
<th>Item Needed</th>
<th>Give To/ Coordinate With</th>
<th>Estimated Completion Date</th>
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<tbody>
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<td>ROCC</td>
<td>Robert Relyea</td>
<td>initials</td>
<td>Quarterly emergency training exercise plan</td>
<td>Ronald Bodmer</td>
<td>08/31/15</td>
</tr>
<tr>
<td>OEM</td>
<td>Ronald Bodmer</td>
<td>initials</td>
<td>Quarterly emergency training exercise plan</td>
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<td>Gregory Wortman</td>
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5 CAP Completion Documentation

After Metro's collective review, a memorandum with enclosed CAP deliverables (refer to 4.1) will be provided to FTA to support the closure of this required action.

6 Performance Measures

Completion of four drills and percent resolution of items in after action reports.

7 Verification

Review of after action reports and field observations of drills.
8 CAP Approval

APPROVED BY:

[Signature]
09/10/15

Action Coordinator
Gregory Wortman
Assistant Director of Rail Operations Control Center (ROCC)

[Signature]
09/10/15

Department Head
Hercules Ballard
Managing Director of Rail Transportation (RTRA)

[Signature]
10 SEP 15

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