February 12, 2021

QICO 2020

CYQ3 & CYQ4 REVIEWS

Washington Metropolitan Area Transit Authority
WMATA

Engineering and Maintenance

10. *Structure Grout Pad Renewal*

Capital Program-Management & Execution

11. *Switch Machine Power Supply Replacement*

Safety Review

12. *Operations Management Services*

Quality Assurance, Internal Compliance & Oversight (QICO)
Promoting Transparency, Accountability and Public Confidence

TABLE OF CONTENTS

WHAT WE DO

What is QICO?

The Office of Quality Assurance, Internal Compliance & Oversight (QICO) is an internal management function that partners with other departments to provide an objective review. QICO and the internal review process are authorized by the General Manager as outlined in the Quality Management System Plan (QMSP).

Why QICO Performed These Reviews?

These reviews are intended to provide Metro senior management with an assessment of the following areas:

- Structure Grout Pad Renewal
- Switch Machine Power Supply Replacement
- Operations Management Services

QICO's Methodology:

- Develop relevant review activities by identifying and assessing any risks to align with the QMSP 15 Core Standards.
- Compliance with the WMATA System Safety Program Plan (SSPP) is assessed through internal safety reviews.
- Review documentation, observe processes, and interview key personnel.
- Findings and required actions are assigned a risk rating, which ranges on a scale from "Insignificant" to "High".

Note: An itemized internal Corrective and Preventive Action (iCAPA) is developed for each required action to achieve effective and measurable resolution of identified concerns. To check the status of iCAPA implementation go to: wmata.com/initiatives/transparency/.

WHAT WE FOUND | CYQ3-Q4 INTERNAL QUALITY & SAFETY REVIEWS

February 2021

Engineering & Maintenance

10. Structure Grout Pad Renewal (SGPR)

Action Areas Identified During Review:

- Developing a process to define roles and responsibilities between ENGA, MOWE, and TRST would establish consistent accountability and support of design, maintenance, and repair.
- Adhering to the established construction materials inspection and testing requirements would satisfy compliance with concrete strength and other specifications.
- Verifying equipment calibration before use would validate equipment performance, safety and avoid damage to the structure integrity.
- Following approved work instructions and complying with design specifications would promote quality, avoid rework and reduce waste.
- Alignment of governing documentation and issuance of consistent standards and work instructions would minimize confusion and improve efficiency.

Capital Program-Management & Execution

11. Switch Machine Power Supply Replacement (SMPS)

Action Areas Identified During Review:

- Establishing governing documentation would provide a standard for work processes, promote efficiency and assist in maintaining compliance throughout the life of the project.
- Maintaining a training and certification matrix for employees and contractors promotes proper skills management and safety compliance.
- Tracking the contractor's drug and alcohol program would assist in monitoring compliance to contract requirements.
- Conducting safety and quality oversight on contractor performance serves as a verification tool for the fulfillment of performance requirements.
- Establishing a change management process promotes effective document control and improves project and departmental efficiency.

Internal Safety Review

12. Operations Management Services (OPMS)

Wins:

- ✓ Technical Skills and Maintenance Training (TSMT) has developed and implemented a comprehensive system to regularly maintain a less than one percent RWP "Out of Compliance" status on a monthly basis.
- ✓ TSMT Apprentice Programs add value to the organization by providing highly skilled training in specialized fields that would not typically be practical to recruit for.

Items Resolved During Review:

- ✪ Following established formal compliance check program validates training is delivered according to established rules, policies and procedures.

Action Areas Identified During Review:

- Creating and instituting documentation of all SSPP required plans and documents promotes a strong safety culture.
- Using designated share drive to store and access the latest controlled document reduces the risk of disseminating obsolete information.
- Revising the Roadway Worker Protection (RWP) training course to include the Hazardous Concern Form as referenced in the RWP SOP (January 2020) promotes a culture of safety in the classroom and on the job.
- Updating WAVS SOP to include both controlled documentation of completed random checks and appropriate controls for remote access to confidential information reduces risks to WMATA and WMATA personnel.

WHAT WMATA WILL DO MOVING FORWARD

Key Takeaways

10. *Collaboration on document control and materials selection between Track & Structures, Engineering and Maintenance of Way Engineering is critical for an effective grout pad renewal program.*

- Develop and submit roles and responsibilities of ENGA, MOWE, TRST and SAFE for grout pad reconstruction and controlled document material approval process.
- For details on committed actions, see the following iCAPAs: QICO-SGPR-21-01, QICO-SGPR-21-02, QICO-SGPR-21-03, QICO-SGPR-21-04.

Key Takeaways

11. *Developing controlled work processes and strengthening contractor oversight would promote project efficiency and encourage a safe work environment.*

- Create a Project Specific Quality Management Plan, inclusive of governing processes that would facilitate the oversight of safety compliance and quality of work.
- For details on committed action see the following iCAPA: QICO-SSRP-21-01.

Key Takeaways

12. *Participation in a Departmental Safety Committee, maintaining a training matrix by position, and implementing a safety rulebook compliance check program are essential to establishing a safety-first culture.*

- Develop, revise and implement documentation to advocate compliance with the SSPP and departmental SOPs.
- For details on committed action, see the following iCAPA: QICO-OPMS-21-01.

Washington Metropolitan Area Transit Authority

INTERNAL REVIEW 2020

Internal Review: Engineering & Maintenance

(10) Structure Grout Pad Renewal

September 30, 2020

Quality Assurance, Internal Compliance & Oversight (QICO)

Promoting Transparency, Accountability, & Public Confidence

ENGINEERING & MAINTENANCE

SERVICE DELIVERY

CAPITAL PROGRAM – MANAGEMENT & EXECUTION

INTERNAL SAFETY REVIEW

What is QICO?

- The Office of Quality Assurance, Internal Compliance & Oversight (QICO) is an internal management function that partners with other departments to provide an objective review. QICO and the internal review process are authorized by the General Manager as outlined in the Quality Management System Plan (QMSP).

Why QICO Performed This Review:

- This internal review is intended to provide Metro senior management with an assessment of the grout pad renewal program, its effectiveness and conformance with established standards.

QICO's Methodology:

- Develop relevant review activities by identifying and assessing any risks to align with the QMSP 15 Core Standards.
- Review documentation, observe processes, and interview key personnel.
- Findings and required actions are assigned a risk rating, which ranges on a scale from "Insignificant" to "High".

INTERNAL REVIEW SUMMARY

September 2020

(10) Structure Grout Pad Renewal (SGPR)

Key Takeaway:
Collaboration on document control and materials selection between Track & Structures, Engineering and Maintenance of Way Engineering is critical for an effective grout pad renewal program.

Areas for Improvement:

- Developing a process to define roles and responsibilities between ENGA, MOWE, and TRST Would establish consistent accountability and support of design, maintenance, and repair.
- Adhering to the established construction materials inspection and testing requirements would satisfy compliance with concrete strength and other specifications.
- Verifying equipment calibration before use would validate equipment performance, safety and avoid damage to the structure integrity.
- Following approved work instructions and complying with design specifications would promote quality, avoid rework and reduce waste.
- Alignment of governing documentation and issuance of consistent standards and work instructions would minimize confusion and improve efficiency.

Supplementary Guidance:

- Enhanced control of personnel exiting the roadway by completing the job safety briefing log would improve employee safety.

Required Actions:

- **QICO-SGPR-21-01:** Develop and submit roles and responsibilities of ENGA, MOWE, TRST and SAFE for grout pad reconstruction and controlled document material approval process.
- **QICO-SGPR-21-02:** Enforce the implementation of the established construction inspection sampling and testing standards.
- **QICO-SGPR-21-03:** Executing and completing quality control checklists to verify equipment calibration and material expiration dates before use.
- **QICO-SGPR-21-04:** Enforce adherence to approved work instructions and proper execution of work standards.

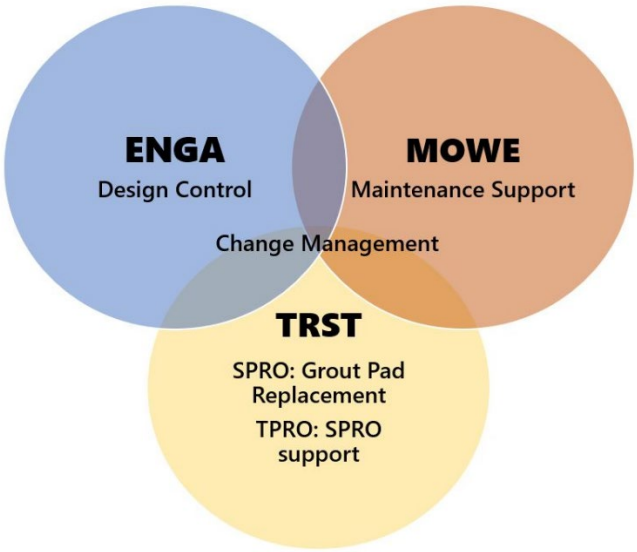
Previous External Corrective Action Plans (CAPs) and Internal Corrective Action and Preventive Actions (iCAPAs) Status:

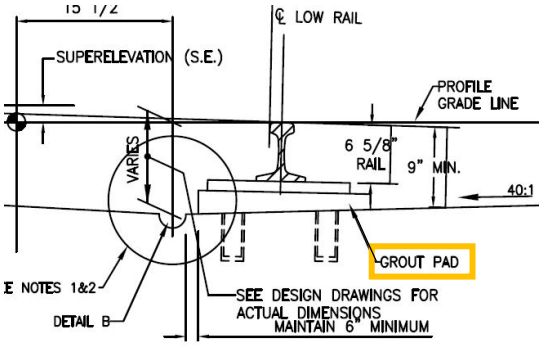
- Washington Metro Safety Committee (WMSC)
  - **WMSC-19-C0031:** TRST will create and submit a procedure for TRST Supervisors and Managers Quality Control checks – Open, due 1/13/2021.

Note: An itemized internal Corrective and Preventive Action (iCAPA) is developed for each required action to achieve effective and measurable resolution of identified concerns. To check the status of iCAPA implementation go to https://www.wmata.com/initiatives/transparency

10.1. FUNCTIONAL OVERVIEW AND STRUCTURE

Grout pads function as buffer between the support structure and railroad in direct fixation tracks. The purpose of the grout pad is to transfer railroad loading to the invert (i.e. bridges and tunnels) uniformly, absorb impact, provide support to track fasteners, maintain horizontal and vertical geometry and help in achieving the required cant/superelevation in curved tracks. Due to the nature of their function, grout pads require periodic repairs and rehabilitation.
The grout pad rehabilitation program requires collaboration between: ENGA, provides design specifications; TRST, performs the rehabilitation work; MOWE, provides technical support to TRST.





Grout Pad Sketch

Grout Pad Photo

Track and Structures (TRST)

The Office of Track and Structures (TRST) mission is to ensure a positive daily commute for WMATA customers by conducting inspections, maintenance and rehabilitation programs that enhance the condition of the guideways and structures.
The Structures Production (SPRO), branch within TRST, is responsible for structural rehabilitation and renewal of WMATA's Rail System. SPRO performs the grout pad replacement with the support of Track Productions (TPRO) to remove and reinstall rail from the fasteners.

Maintenance of Way Engineering (MOWE)

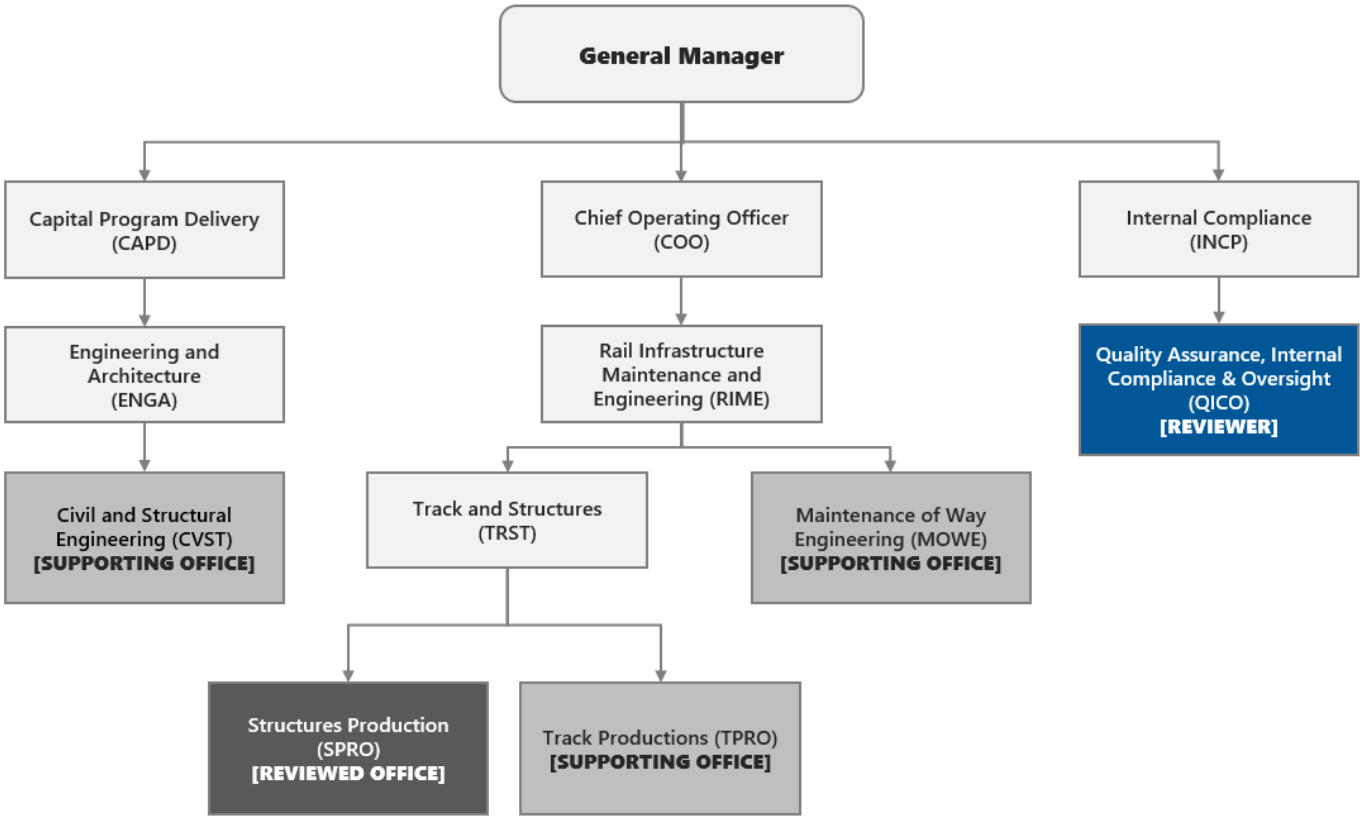
MOWE's mission is to ensure balance of track usage that will maximize safe and reliable service. MOWE uses technical experts to maintain existing infrastructure and implement a strategic approach to maintenance that prioritizes work focusing on safety and reliability and maximizes the utility of track time. MOWE is responsible for providing technical support to TRST and all work groups that need track access. MOWE collaborates with Engineering and Architecture (ENGA) to advance technical specifications and Engineering Modification Instructions (EMI).

Engineering and Architecture (ENGA)

ENGA is the owner of designs and specifications, supporting the overall mission of WMATA to provide safe, reliable and efficient transportation.
Civil & Structural Engineering (CVST) is the office within ENGA responsible for planning, directing, overseeing and coordinating engineering programs pertaining to civil and structural infrastructure. CVST manages the divisions of structural engineering, geomatics (surveying), civil and environmental engineering and interfaces with operations and maintenance divisions to address State of Good Repair (SOGR) efforts.

Organizational Structure and Background

The Office of Quality Assurance, Internal Compliance and Oversight (QICO) conducted an internal review of Grout Pad Renewal during the second quarter of CY2020 (April 06 - June 30, 2020) but was extended through August due to COVID-19 disruption of the scheduled work. Within WMATA, the Office of SPRO reports to the General Superintendent TRST.



10.2. REVIEW SCOPE

Documentation Review

TRST/SPRO governing documents including Standard Operating Procedures (SOPs), Work Instructions and Operations Administrative Policies (OAPs)

- OAP 121-01 Track Asset Condition Data Management (Rev 2, dated 09/20/2019)
- OAP 108-02 Document Control Policy (Rev 0.0, dated (04/28/2020)
- OAP 208-05 TRST Internal Safety Equipment Calibration (Rev 0.0, 2/9/2016)
- SOP 208-02 Handheld Radio Certification Process, (Rev 0, dated 7/30/2019)
- SOP 208-08 TRST Structures Maintenance Management (Rev 0, dated 02/02/2017)
- Work Instruction WITK 701.1 Torque Studs and Clips bolts on Direct Fixation Track (Rev 6, dated 02/26/2020)
- WITK 701.2 Stud Replacement Core Drilling and Setting of Anchor Studs on Direct Fixation Track (Rev 0, dated 05/21/2020)
- WITK 701.6 Replacement of Grout Pads – Bottom Up Construction (Rev 1, dated 01/22/2020)
- Direct Fixation Track Construction (DFTC) 05653 (04/2020)
- SPRO Technicians Training Records
- List of Calibrated Equipment
- SPRO QA/QC Inspection records (October – December 2019)

Key Personnel Interviewed

- Superintendent, Structures Production, TRST
- Director, Track Engineering, MOWE
- Deputy Chief Track, Structures and Facilities Engineering, ENGA

Field Assessments

- Field Activities observed during the Internal Review on June 12 & 25, 2020 and August 6 & 12, 2020 included:
  - Testing and calibration verification of Warning Strobe Alarm Devices (WSAD)
  - Calibration verification of Geismar torque machines
  - Construction material expiration dates and proper approval process
  - Assessment of grout pad construction per the work instructions and design documents
- Field Discussions on June 12 & 25, 2020 and August 6 & 12, 2020:
  - SPRO Shift Supervisors
  - SPRO Superintendent
  - TPRO Assistant Superintendent
  - TPRO Shift Supervisor

10.3. AREAS FOR IMPROVEMENT

Findings are categorized by the 15 Core QMS Standards and rated by the Risk Assessment

FQ-SGPR-21-01 Design Control — **Service Delivery – High (5, 4)** — **Owner – MOWE**

- **Developing a process to define roles and responsibilities between ENGA, MOWE, and TRST Would establish consistent accountability and support of design, maintenance, and repair.**

Discussion

Configuration management plan is a system with a set of tools and data used to establish process control and consistency in design specifications, material selections and work instructions.

- QICO requested documented evidence from ENGA and TRST for the approval process of materials used in grout pad construction. No documents were received either from ENGA or TRST.
- During QICO's interview with ENGA, it was noted:
  - ENGA does not have an established approval process when TRST or MOWE requests material approvals. Approval communication is sent either verbally or via email.
  - ENGA reviewed Work Instruction WITK 701.6 Replacement of Grout Pads – Bottom Up Construction but was not included in the signatory process. As owner of the design and specifications, ENGA should have primary responsibility of material approval and maintenance processes.
  - Some grout materials used and specified in WITK 701.6 section 10.1.5.3 can achieve compressive strengths above 9000 psi which is higher than the maximum compressive strength of 6000 psi specified in Direct Fixation Track Construction DFTC-05653 section 1.05 C.2. b. Material strength higher than specified would be a concern during demolition as additional efforts may be required and may result in damaging the invert.
- QICO observed Repcon-H grout material used on June 12, 2020 was not approved by SAFE per Policy Instruction P/I 4.14/3.

FQ-SGPR-21-02 Inspection, Testing & Status — **Service Delivery – High (4, 5)** — **Owner – TRST**

- **Adhering to the established construction materials inspection and testing requirements would satisfy compliance with concrete strength and other specifications.**

Discussion

Grout material testing is vital as a quality control and assurance measures to verify compliance with mix design and material specifications for expected performance and minimize premature failure.

- QICO noted that grout mixes used in the field were not sampled or tested in accordance with the Quality Assurance / Quality Control (QA/QC) requirements stated in the Work Instruction WITK 701.6 Replacement of Grout Pads – Bottom Up Construction and Direct Fixation Track Construction DFTC 05563. Field observations on June 12, 25, and August 12, 2020 indicated no sampling or testing was performed. QICO requested QA/QC checklist documentation from SPRO. No documents were received.
  - WMSC issued CAP **WMSC-19-C0031**: TRST will create and submit a procedure for TRST Supervisors and Managers Quality Control checks.
- During QICO's field assessments, no anchor stud pullout testing was performed. QICO requested test results documentation from TPRO and MOWE to verify required testing was performed per DFTC-05653, sections 1.05 E and F. No documents were received.
- QICO requested grout material test result documents from TRST for any testing performed between January and March 2020. Another request was made for the work performed in June 2020 on L-line bride and in August 2020 on Grosvenor aerial bridge on A-line. No documents were received.

FQ-SGPR-21-03 Inspection, Measuring & Test Equipment **Service Delivery – High (4, 5)** **Owner – TRST**

- **Verifying equipment calibration and rating before use would validate equipment performance, safety and avoid damage to the structure integrity.**

Discussion

Equipment calibration certifies equipment accuracy and minimizes uncertainty. Using calibrated equipment helps control errors before they occur.

- Work Instruction WITK 701.6 Replacement of Grout Pads – Bottom Up Construction 11.1.4.42, requires employees to check equipment calibration before usage.
  - QICO's field assessments on June 12 & 25, 2020 (L-line bridge) and August 6 & 12, 2020 (A-line Grosvenor Aerial Structure) indicated that more than 80 percent of Geismar Torque machines used were past labeled calibration due dates.
  - TPRO personnel did not check calibration stickers on torqueing machine(s) to make certain the calibration dates are current. Torqueing machines with expired certifications are to be immediately reported to proper authority and the machine to be "tagged / removed from service" until such calibration certification is issued.
  - On June 12, 2020 uncalibrated torque machines D78 and D81, and on August 6, 2020 uncalibrated torque machine D72 were used. TRST superintendent was notified of the discrepancies. On June 25 and August 12 during QICO's follow up assessments, the same uncalibrated equipment was still in use.
  - On June 12, 2020, QICO observed cracked grout pads from the new construction where these uncalibrated torque machines were used.
- During a field assessment on August 12, 2020, QICO observed WSAD Unit V0486S T 0003PSE in use with a past due calibration date of 8/8/20.
  - WMSC issued WMATA a Corrective Action Plan (CAP) June 2020 audit of Roadway Worker Protection (RWP) and Training. The CAP requires WMATA to develop a procedure or checklist to ensure all work equipment is inspected prior to use and confirm that there is enough certified safety equipment available to meet all RWP requirements.
- During June 12, 2020 field assessment, QICO observed an oversized jack hammer (90 lbs.) was used on the L-line Aerial Structure to demolish existing grout pads. Per WITK 701.6 section 11.1.4.12, demolition of existing grout pads for Aerial Structures should be performed with the use of 60 lbs. jack hammer.
- During an August 12, 2020 field assessment, QICO observed four (4) jack hammers were missing manufacturer labels to identify their sizes.

FQ-SGPR-21-04 Process Control **Service Delivery – Elevated (4, 4)** **Owner – TRST**

- **Following approved work instructions and complying with design specifications would promote quality, avoid rework and reduce waste.**

Discussion

Grout design specifications and work instructions encompass detailed descriptions of work processes to help achieve consistency and accuracy of rehabilitation work. Inconsistent work processes and the use of expired materials can reduce life expectancy and increase maintenance cycles of track work.

- During August 6 and 12 field assessments on the Red line aerial structure, QICO observed the following:
  - More than 20 grout pads (13% of the area observed) that were oversized from the maximum specified length of 10 ft. as described in Work Instruction WITK 701.6 Replacement of Grout Pads – Bottom Up Construction section 11.1.4.18.
  - Surveying personnel did not scan and mark the location of deck rebar grids with scanning equipment before stud installation as stated in WITK 701.6, section 11.1.1.2.
  - Corroded and sheared anchor studs that were not replaced in accordance with WITK 701.6 section 11.3.10.
  - Core drilling for stud replacement resulted in cutting rebar at A1 CM 524+80. Core drilling and embedment hole cleaning was not performed as per WITK 701.6 section 11.1.4.32.
  - Anchor studs were not marked before torqueing as stated in WITK 701.1 section 11.3.3.
  - Fast-Curing Anchoring Adhesive AT-XP used on 8/12/2020 was expired having an expiration date of 4/28/20.
- During field assessments on June 12, 25 and August 6, 2020, QICO observed drain grates not covered during construction to prevent clogging per WITK 701.6. section 11.1.4.4.

FQ-SPGR-21-05 Document Control **Service Delivery – Elevated (4, 3)** **Owner – TRST**

- **Alignment of governing documentation and issuance of consistent standards and work instructions would minimize confusion and improve efficiency.**

Discussion

Document control system is a critical tool for consistent work performance. It supports the management of documents and minimizes discrepancies between governing documents.

- QICO identified document discrepancies between the following:
  - Direct Fixation Track Construction DFTC-05653 section 3.02 B dictates a minimum of (six [6] inch) exposure of existing invert between grout pads while Work Instruction WITK 701.6 Replacement of Grout Pads – Bottom Up Construction section 11.1.4.18 specifies (eight [8] inches) of minimum exposure.
  - Inconsistency within WITK 701.6, section 10.1.5 specifying using different materials based on grout thickness, although section 11.1.4.26 indicates the use of the same material for different grout thickness.
  - Nylon inserts are required according to WITK 701.6, section 11.1.4.36, but it is not a requirement according to Work Instruction WITK 701.2 Stud Replacement Core Drilling and Setting of New Anchor Studs. SPRO personnel were observed applying grease to anchor studs before installation and did not using nylon sleeve inserts during field assessments.
  - OAP 208-05 TRST Internal Safety Equipment Calibration (Rev 0.0, 2/9/2016) and SOP 208-08 TRST Structures Maintenance Management (Rev 0, dated 02/02/2017) are noted to have past due revision dates.

10.4. SUPPLEMENTARY GUIDANCE – QUALITY BUSINESS PRACTICES

The following item(s) are not part of the reviewed governing documentation and will not be included into the official corrective action plans. By addressing these items, the department may experience an overall benefit.

G-SGPR-21-01	Process Control	Will Reduce Safety Risk	Owner – TRST

- **Enhanced control of personnel exiting the roadway by completing the job safety briefing log would improve employee safety.**

Discussion

Completing time out fields on the job safety briefing log is essential to verify and formally account for all employees in the work zone.

- According to Metro Safety Rules and Procedures Handbook (MSRPH) Appendix C of SOP #28 personnel entering the roadway must sign on the safety briefing sheet, signing-out is not addressed in the MSRPH, but the job safety briefing log include a time out field.
- During field assessments on June 12, 25 and August 6 & 12, 2020, QICO noted job safety briefing log time out fields were not completed after personnel exited the roadway.

10.5. SUMMARY OF REQUIRED ACTIONS

QICO-SGPR-21-01 **Action Owner – MOWE** **Overall Risk – High** (Average Score)

Required Action: Develop and submit roles and responsibilities of ENGA, MOWE, TRST and SAFE for grout pad reconstruction and controlled document material approval process.

Applicable Findings

- **FQ-SGPR-21-01: Developing a process to define roles and responsibilities between ENGA, MOWE, and TRST would establish consistent accountability and support of design, maintenance, and repair.**
  - **Standard:** Design Control **Risk:** Legal & Compliance – Risk Rating (5, 4)
- **FQ-SGPR-21-05: Alignment of governing documentation and issuance of consistent standards and work instructions would minimize confusion and improve efficiency.**
  - **Standard:** Document Control **Risk:** Service Delivery – Risk Rating (4, 4)

QICO-SGPR-21-02 **Action Owner – TRST** **Overall Risk – High** (Average Score)

Required Action: Enforce the implementation of the established construction inspection sampling and testing standards.

Applicable Findings

- **FQ-SGPR-21-02: Adhering to the established construction materials inspection and testing requirements would satisfy compliance with concrete strength and other specifications.**
  - **Standard:** Inspection, Testing & Status **Risk:** Service Delivery – Risk Rating (4, 5)

QICO-SGPR-21-03 **Action Owner – TRST** **Overall Risk – Elevated** (Average Score)

Required Action: Executing and completing quality control checklists to verify equipment calibration and material expiration dates before use.

Applicable Findings

- **FQ-SGPR-21-03: Verifying equipment calibration before use would validate equipment performance, safety and avoid damage to the structure integrity.**
  - **Standard:** Inspection, Measuring & Test Equipment **Risk:** Service Delivery – Risk Rating (4, 4)

QICO-SGPR-21-04 **Action Owner – TRST** **Overall Risk – Elevated** (Average Score)

Required Action: Enforce adherence to approved work instructions and proper execution of work standards.

Applicable Findings

- **FQ-SGPR-21-04: Following approved work instructions and complying with design specifications would promote quality, avoid rework and reduce waste.**
  - **Standard:** Process Control **Risk:** Service Delivery – Risk Rating (4, 4)

Internal Corrective and Preventive Actions (iCAPAs) are designated to address each Required Action listed above.

Washington Metropolitan Area Transit Authority

INTERNAL REVIEW 2020

Internal Review: Capital Program-Management & Execution

(11) Switch Machine Power Supply Replacement (SMPS)

December 31, 2020

Quality Assurance, Internal Compliance & Oversight (QICO)

Promoting Transparency, Accountability, & Public Confidence

ENGINEERING & MAINTENANCE

SERVICE DELIVERY

CAPITAL PROGRAM – MANAGEMENT & EXECUTION

INTERNAL SAFETY REVIEW

What is QICO?

- The Office of Quality Assurance, Internal Compliance & Oversight (QICO) is an internal management function that partners with other departments to provide an objective review. QICO and the internal review process are authorized by the General Manager as outlined in the Quality Management System Plan (QMSP).

Why QICO Performed This Review:

- This internal review is intended to provide Metro senior management with an assessment of the state of Switch Machine Power Supply Replacement (SMPS) project and promote the actions needed to address any concerns.

QICO's Methodology:

- Develop relevant review activities by identifying and assessing any risks to align with the QMSP 15 Core Standards.
- Review documentation, observe processes, and interview key personnel.
- Findings and required actions are assigned a risk rating, which ranges on a scale from "Insignificant" to "High".

INTERNAL REVIEW SUMMARY

December 2020

(11) Switch Machine Power Supply Replacement (SMPS)

Key Takeaway:

Developing controlled work processes and strengthening contractor oversight would promote project efficiency and encourage a safe work environment.

Areas for Improvement:

- Establishing governing documentation would provide a standard for work processes, promote efficiency and assist in maintaining compliance throughout the life of the project.
- Maintaining a training and certification matrix for employees and contractors promotes proper skills management and safety compliance.
- Tracking the contractor's drug and alcohol program would assist in monitoring compliance to contract requirements.
- Conducting safety and quality oversight on contractor performance serves as a verification tool for the fulfillment of performance requirements.
- Establishing a change management process promotes effective document control and improves project and departmental efficiency.

Supplementary Guidance – Quality Business Practices:

- Having a project quality manager would promote design and installation consistency throughout the SMPS project.
- Proper utilization of [redacted] and participation in wayside work planning meetings will promote effective scheduling of wayside work activities.
- Having an independent inspection party included in the contract prevents conflict of interest and provides assurance of a quality product.

Required Actions:

- **QICO-SSRP-21-01:** Create a Project Specific Quality Management Plan, inclusive of governing processes that would facilitate the oversight of safety compliance and quality of work.

Note: An itemized internal Corrective and Preventive Action (iCAPA) is developed for each required action to achieve effective and measurable resolution of identified concerns. To check the status of iCAPA implementation go to https://www.wmata.com/initiatives/transparency

11.1. FUNCTIONAL OVERVIEW AND STRUCTURE

Signaling Systems Renewal Program (SSRP)

The Office of Capital Program Delivery (CAPD) serves as Metro's internal "design-builder" executing projects on behalf of the asset owners, specifically infrastructure projects that require new/updated designs, multi-discipline coordination or significant construction/rehabilitation work. CAPD is responsible for the planning, management, development and execution of a comprehensive long-range capital improvement program including support to various WMATA departments for their annual renewal/replacement programs.

Within CAPD, the Office of Signaling Systems Renewal Program (SSRP) is responsible for contractor oversight and delivery of the renewal/rehabilitation of capital projects relating to the automatic train control system. SSRP partners with Automatic Train Control Engineering (ATCE) for technical specifications and Shops and Material Support (SAMS) to perform acceptance testing to implement capital improvements throughout the WMATA system (see Figure 1).

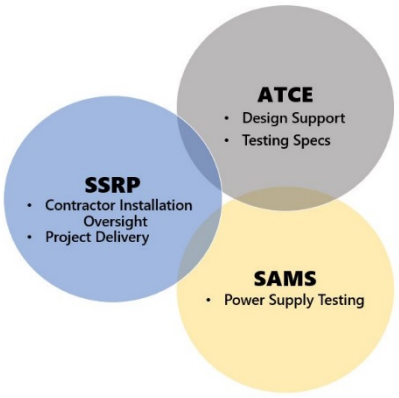


Figure 1: Collaborating Functions

SSRP leads WMATA's signaling system renewal program through the identification of the next generation signaling solutions, development, and delivery of projects to address the unique complexities associated with the existing aging ATC system.

SSRP oversees the Switch Machine Power Supply Replacement (SMPS) project (contract, FQ18119), with the scope of replacing 166 switch machine power supplies throughout the rail system. Due to limited parts availability and dissolution of the Original Equipment Manufacturers (OEM), the switch machine power supplies are being replaced. This project is intended to bring the ATC system into compliance with the Federal Transportation Administration (FTA) mandated state of good repair.

QICO conducted the Internal Review of the SMPS project during the first quarter (July 2020 – September 2020) of the fiscal year 2021. The project consists of two (2) main phases: The Project Development phase and the Project Execution phase. This Internal Review occurred during the Project Execution phase, which includes power supply installation, testing, acceptance and monitoring. This is an ongoing project with expected completion by January 2022 (see Figure 2). The scope of the SMPS project requires testing and acceptance to assure the quality of equipment installed is compliant with WMATA requirements. The scope of QICO's internal review was limited to the analysis of tasks and activities under the responsibility of the WMATA project management team. QICO verified the contractor's RWP badge compliance during field assessments; however, the contractor's activities were not part of this assessment.

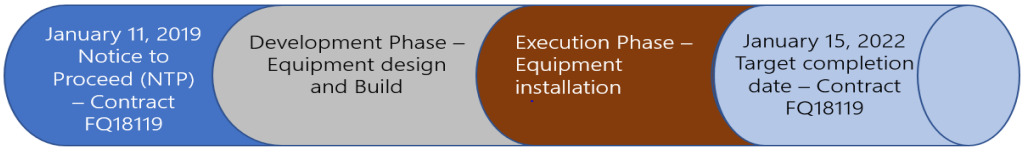
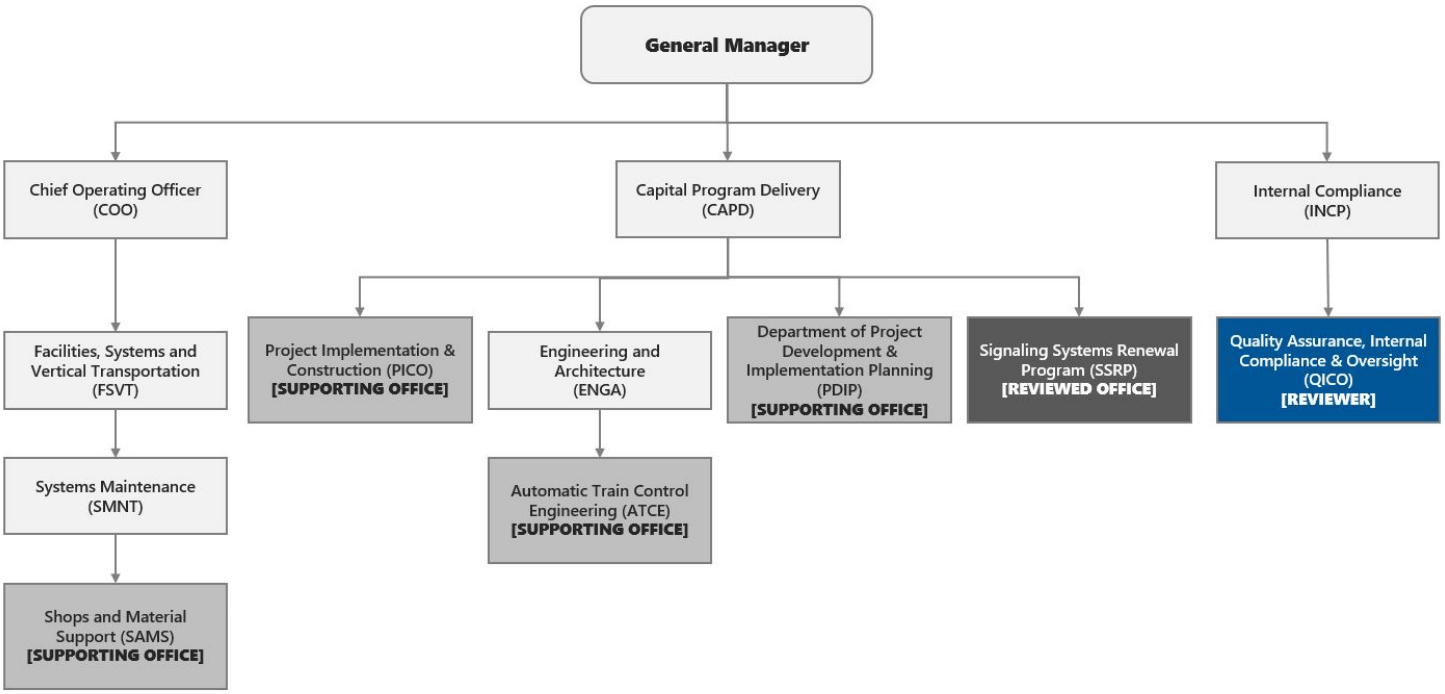


Figure 2: Project Timeline

Organizational Structure and Background

SSRP is the reviewed office, a sub-department of CAPD and receives support from several offices. Within WMATA, CAPD reports to the General Manager and oversees the functions of Project Development & Implementation Planning (PDIP), Project Implementation & Construction (PICO), Engineering and Architecture (ENGA) and SSRP. As shown in the organization chart, QICO is independent of this function, reporting to the General Manager through Internal Compliance (INCP).



11.2. REVIEW SCOPE

Documentation Review

- Switch Machine Power Supply Replacement conformed contract, FQ18119
- The FTA Project and Construction Guidelines (2016)
- WMATA Quality Management System Plan (QMSP) Rev.1.3 (8/2018)
- Metrorail Safety Rules and Procedures Handbook (MSRPH) (11/1/2018)
- WMATA Project Implementation Manual (PIM) Rev. 6 (6/2015)
- SMPS Site Specific Work Plan (SSWP) – November 12, 2019
- Operations Administrative Procedure (OAP) 200-33 Site Specific Work Plan (Rev. 00) – June 2, 2006
- Policy/Instruction 6.1/5 Records Management Policy – June 5, 2020

Personnel Discussions

- SMPS Project Manager – July 15, 2020
- Construction Engineer (2) – July 14, 2020, September 15, 2020
- SSRP Supervisor of Construction Inspection - July 22, 2020
- Contracting Officer's Technical Representative (COTR) - July 15, 2020
- Project support administrative personnel (2) – July 9, 2020, July 16, 2020

Field Assessments

- Field assessment activities observed at each location:
  - Removing old Switch Machine Power Supply
  - Installing the new Switch Machine Power Supply
  - Testing the new Switch Machine Power Supply
  - Clean up and removal of old power supplies from the Train Control Room (TCR)
- Field assessment locations:
  - Mt. Vernon Square Station, July 10, 2020
  - Farragut North Station, July 24, 2020
  - Foggy Bottom Station, July 29, 2020
  - Ballston Station, September 4, 2020
  - Shady Grove Yard, September 11, 2020
  - Eastern Market Station, September 16, 2020

11.3. AREAS FOR IMPROVEMENT

Findings are categorized by the 15 Core QMS Standards and rated by the Risk Assessment

FQ-SSRP-21-01 Process Control — **Service Delivery – High (4,5)** — **Owner – SSRP**

- **Establishing governing documentation would provide a standard for work processes, promote efficiency and assist in maintaining compliance throughout the life of the project.**

Discussion

Governing documentation provides guidelines for process control to accurately monitor and effectively manage the project life cycle. Project documentation is a vital part of project management that lays the foundation for quality and traceability.

- Per WMATA QMSP section 3.5, each department and project shall include and describe in its QMP the processes that bring together resources, equipment, and activities resulting in work products, assets and services.
- QICO requested governing documentation, including Standard Operating Procedures (SOPs), Quality Management Plan (QMP) and applicable OAPs related to the SMPS project on June 11, 2020. However, the project management team did not provide any documented processes or QMP for this project.
- Per WMATA QMSP section 3.8, WMATA QMPs will establish procedures to:
  - Identify when a work item, existing asset, or task does not conform to requirements.
  - Ensure that work items or existing assets that do not conform to contract documents and specifications are immediately identified.
  - Report upon such non-conformances and determine the appropriate disposition.
  - Document non-conformances in reports, forms, logs, as applicable, to verify that only work that meets requirements is accepted and to facilitate trend and root cause analysis.

  The SSRP project team does not have a documented process in place to assist in non-conformance identification, mitigation or closure. The prime contractor currently self-reports non-conformances in their monthly QA/QC report, which is reviewed and approved by SSRP. As of October 1, 2020, the contractor has not reported any non-conformances.

FQ-SSRP-21-02 Training — **Service Delivery – Moderate (3,3)** — **Owner – SSRP**

- **Maintaining a training and certification matrix for employees and contractors promotes proper skills management and safety compliance.**

Discussion

A training matrix identifies areas of required training for specific positions within an organization. Mandatory training promotes a standard knowledge level needed to efficiently perform the tasks associated with these positions. Having a training matrix assists the project team in monitoring compliance with training requirements on a continuous basis and assists in identifying training needs.

- Per WMATA QMSP section 3.12, a training matrix shall be utilized as appropriate to identify staff roles and the corresponding relevant training needs for each role. Additionally, project staff qualifications, including completed training, certifications, and licenses, shall be maintained within project or department files.
- QICO requested the training matrix from SSRP and training records for both SSRP personnel and contractors on June 11, 2020, inclusive of Roadway Worker Protection (RWP) level four (4). QICO noted the following:
  - There was no training matrix for the SSRP project team as of October 1, 2020.
  - 50% of the SSRP project team training records were submitted to QICO; however, in the absence of a training matrix, QICO was unable to verify compliance with the actual training requirements.
  - The contractor's submitted resumes in [redacted] were reviewed by the SSRP project team to validate contract training compliance.
- QICO was able to verify the contractor and SSRP inspector compliance with RWP by performing an in-person badge inspection during field assessments.

FQ-SSRP-21-03 Quality Records **Service Delivery – Moderate (3,3)** **Owner – SSRP**

- **Tracking the contractor's drug and alcohol program would assist in monitoring compliance to contract requirements.**

Discussion

A comprehensive drug & alcohol screening policy helps reduce the risk of accidents and down time and promotes safety culture.

- Per Contract FQ18119 section 00782, the following is required:
  - The prime contractor is required to submit their drug and alcohol quarterly report to the SSRP Contracting Officer Technical Representative (COTR) before the 15th of each month following the end of the quarter.
- QICO requested copies of the prime contractor's Drug and Alcohol Policy testing logs on June 11, 2020, but as of September 30, 2020, no testing logs for the Drug and Alcohol Policy have been submitted to WMATA. WMATA's SSRP project team does not currently verify contractor compliance with the Drug and Alcohol testing requirements.
- QICO requested a copy of the quarterly drug and alcohol report or record of receipt on October 22, 2020, but no document was received as of November 5, 2020.

FQ-SSRP-21-04 Inspection, Testing & Status **Safety – Moderate (3,3)** **Owner – SSRP**

- **Conducting safety and quality oversight on contractor performance serves as a verification tool for the fulfillment of performance requirements.**

Discussion

Safety and quality oversight inclusive of equipment calibration verification is an integral function that manages risks, sets positive expectations, reduces downtime and educates employees on safety and quality measures within the project management life cycle. WMATA oversight of the contractor boosts contractor preparedness to mitigate potential hazards and promotes safety as a priority in the workplace.

- Per MSRPH SOP #41 section 41.5.1.4, Non-Roadway job safety briefings must occur prior to the start of work. During field assessments at Mt Vernon Square, Farragut North, Foggy Bottom, Shady Grove Yard, and Eastern Market locations, QICO did not witness job safety briefings being performed before track access was granted and work began.
- The SSWP outlines the safety plan for the construction and/or installation of equipment and the associated schedule of work to be performed at specific locations where track access is required. The safety plan detailed in the SSWP describes measures taken to protect personnel from accident/injury including required PPE and toolbox/safety talk guidelines. SSRP does not have a process in place to verify contractor compliance with the SSWP's safety plan.
- Per WMATA QMSP section 3.7, all measuring, and testing equipment utilized by the Authority or its agents and contractors must be identified, calibrated, verified, and maintained.
  - The prime contractor currently includes the inspection, measuring, and test equipment used with calibration dates in their Monthly QA/QC Reports.
  - SSRP does not have an independent verification process in place to ensure that the contractor is meeting the requirements in terms of the actual calibration process and the associated controls.
  - Per PIM (2015) Section 9.2, the Authority's Representative is responsible for reviewing the Contractor's test plan and procedures to help ensure the planned tests will demonstrate the functionality and features of the equipment.
  - QICO performed six (6) field assessments at Mt. Vernon Square, Farragut North, Foggy Bottom, Ballston, Shady Grove Yard, and Eastern Market. During these assessments, QICO noted the assigned SSRP inspector presence in the field; however, the SSRP inspector did not conduct calibration verification of the contractor equipment prior to start of work.

FQ-SSRP-21-05	Process Control	Service Delivery	Moderate (3,3)	Owner – SSRP

- **Establishing a change management process promotes effective document control and improves project and departmental efficiency.**

Discussion

The change management process defines the roles and activities to manage and control changes during the project life cycle. Document control is an essential preventive measure to assure only approved and current documentation is being utilized.

- Per WMATA QMSP section 3.2, WMATA departments and projects must include procedures for receiving, transmitting, reviewing, approving, disseminating, and archiving critical documents in their respective QMPs.
- During QICO's six (6) field assessments, the "Master Block" verification was not performed on any of the equipment installations. The "Master Block" verification is a process used to verify proper load sharing between the Normal and Reserve power supplies. SSRP has informed QICO that the "Master Block" verification is not required for the Switch Machine Power Supply installation. The Switch Machine Power Supply Replacement SSWP section 8 includes a verification process that utilizes a "Master Block" test; however, there has been no update to section 8 of the SSWP. An update to the SSWP is needed to align actual power supply installation requirements to the requirements listed in the SSWP.

11.4. SUPPLEMENTARY GUIDANCE – QUALITY BUSINESS PRACTICES

The following item(s) are not part of the reviewed governing documentation and will not be included into the official corrective action plans. By addressing these items, the department may experience an overall benefit.

G-SSRP-21-01	Identification and Traceability of Assets & Material	Will Reduce Service Delivery Risk	Owner – SSRP

- **Having a project quality manager would promote design and installation consistency throughout the SMPS project.**

Discussion

A project quality manager provides quality oversight by verifying project quality and performance are conducted in accordance with contract requirements.

- While the installation sites vary and are not uniform in their layout, equipment installed must maintain an acceptable level of functionality. Quality inspections would encourage equipment installations that meet or exceed contract requirements.
- Quality management assists in collecting, analyzing and summarizing data along with preparing applicable reports to inform stakeholders about the project's quality performance.

G-SSRP-21-02 Process Control **Will Reduce Service Delivery Risk Owner – SSRP**

- **Proper utilization of [redacted] and participation in wayside work planning meetings will promote effective scheduling of wayside work activities.**

Discussion

WMATA uses the [redacted] scheduling system to coordinate track maintenance work. [redacted] identifies the locations in the rail system where track rights are requested and allows departments to schedule track related work in a method that reduces project interference between departments.

- Consistent participation in wayside work meetings is critical to ensure all project work activities do not overlap with other post revenue work and provide the opportunity to schedule piggyback work.
- SSRP stated in mid-August 2020 that they started utilizing the [redacted] scheduling system to eliminate any scheduling conflict. Prior to mid-August, SSRP was not utilizing [redacted] due to a low volume of track maintenance activity.
- On September 10, 2020, QICO met the Switch Machine Power Supply Replacement crew at Shady Grove Station. During this attempted SMPS field assessment, QICO observed the following:
  - Track maintenance equipment such as prime movers were located at the station platform.
  - WMATA Inspector advised QICO that the SMPS replacement would interfere with the ongoing track work.
  - The power supply installation scheduled for September 10, 2020, was canceled and the SMPS replacement at Shady Grove Station was postponed.
- Since the September 10, 2020 postponement was less than the required 30 days, track rights were not confirmed in [redacted].
- QICO accessed [redacted] on September 23, 2020 and verified the use of [redacted] by SSRP to confirm track rights for SMPS Replacement.

G-SSRP-21-03 Inspection, Testing & Status **Will Reduce Service Delivery Risk Owner – SSRP**

- **Having an independent inspection party included in the contract prevents conflict of interest and provides assurance of a quality product.**

Discussion

Independent quality assurance inspection may improve the probability of successful project delivery, validate the contractor's product and minimize the risk of cost and time overruns.

- The current contractor for the SMPS project is responsible for design, installation, and testing; and does not have an independent party perform quality assurance aside from the maximum heat and active vibration validation testing prior to installation.
- On September 19, 2020, SSRP halted the installation of the switch machine power supplies due to multiple failures of the newly installed equipment. To find the root cause of the failure, ATC Engineering decided to put the power supplies through rigorous and cyclical testing to simulate a month's worth of operation at a high use location. As of November 12, 2020, the results of the testing were not yet available.
- While non-conformances are tracked and reported by the contractor, having independent quality assurance inspections would validate the contractor's reporting of discrepancies, facilitate root cause analysis, and mitigate schedule overrun.

11.5. SUMMARY OF REQUIRED ACTIONS

QICO-SSRP-21-01 **Action Owner – SSRP** **Overall Risk – Moderate** (Average Score)

Required Action: Create a Project Specific Quality Management Plan, inclusive of governing processes that would facilitate the oversight of safety compliance and quality of work.

Applicable Findings

- **FQ-SSRP-21-01: Establishing governing documentation would provide a standard for work processes, promote efficiency and assist in maintaining compliance throughout the life of the project.**
  - **Standard:** Process Control **Risk:** Service Delivery – High (4,5)
- **FQ-SSRP-21-02: Maintaining a training and certification matrix for employees and contractors promotes proper skills management and safety compliance.**
  - **Standard:** Training **Risk:** Service Delivery – Moderate (3,3)
- **FQ-SSRP-21-03: Tracking the contractor's drug and alcohol program would assist in monitoring compliance to contract requirements.**
  - **Standard:** Quality Records **Risk:** Service Delivery – Moderate (3,3)
- **FQ-SSRP-21-04: Conducting safety and quality oversight on contractor performance serves as a verification tool for the fulfillment of performance requirements.**
  - **Standard:** Inspection, Testing & Status **Risk:** Safety – Moderate (3,3)
- **FQ-SSRP-21-05: Establishing a change management process promotes effective document control and improves project and departmental efficiency.**
  - **Standard:** Document Control **Risk:** Service Delivery – Low (2,3)

Internal Corrective and Preventive Actions (iCAPAs) are designated to address each Required Action listed above.

Washington Metropolitan Area Transit Authority

INTERNAL SAFETY REVIEW 2020

Internal Review: Internal Safety Review

(12) Operations Management Services (OPMS)

November 30, 2020

Quality Assurance, Internal Compliance & Oversight (QICO)

Promoting Transparency, Accountability, & Public Confidence

ENGINEERING & MAINTENANCE

SERVICE DELIVERY

CAPITAL PROGRAM – MANAGEMENT & EXECUTION

INTERNAL SAFETY REVIEW

INTERNAL SAFETY REVIEW SUMMARY

November 2020

(12) Operations Management Services (OPMS)

Key Takeaway:

Updating and implementing established departmental SOPs to comply with the SSPP is essential to establishing a safety-first culture.

What is QICO?

- The Office of Quality Assurance, Internal Compliance & Oversight (QICO) is an internal management function that partners with other departments to provide an objective review. QICO and the internal review process are authorized by the General Manager as outlined in the Quality Management System Plan (QMSP).

Why QICO Performed This Review:

- This internal safety review is intended to provide Metro senior management with an assessment of the Office of Operations Management Services (OPMS) compliance with federal regulations and WMATA's System Safety Program Plan (SSPP), and promote the actions needed to address any concerns.

QICO's Methodology:

- Develop relevant review activities by identifying and assessing any risks to align with Policies, Procedures & Standard, Training, Certification & Compliance, Hazard Management, and Safety.
- Review documentation, observe processes, and interview key personnel.
- Findings and required actions are assigned a risk rating, which ranges on a scale from "Insignificant" to "High".

What Worked Well:

- ✓ Technical Skills and Maintenance Training (TSMT) has developed and implemented a comprehensive system to regularly maintain a less than one percent RWP "Out of Compliance" status on a monthly basis.
- ✓ Technical Skills and Maintenance Training (TSMT) Apprentice Programs add value to the organization by providing highly skilled training in specialized fields that would not typically be practical to recruit for.

Items Resolved During the Review:

- ✪ Following established formal compliance check program validates training is delivered according to established rules, policies and procedures.

Areas for Improvement:

- Creating and instituting documentation of all System Safety Program Plan (SSPP) required plans and documents promotes a strong safety culture.
- Using designated share drive to store and access the latest controlled document reduces the risk of disseminating obsolete information.
- Revising the Roadway Worker Protection (RWP) training course to include the Hazardous Concern Form as referenced in the RWP SOP (January 2020) promotes a culture of safety in the classroom and on the job.
- Updating WAVS SOP to include both controlled documentation of completed random checks and appropriate controls for remote access to confidential information reduces risks to WMATA and WMATA personnel.

Supplementary Guidance – Quality Business Practices:

- Periodically updating OPMS job descriptions to comply with Human Resources (HR) procedure fulfills qualifications' accuracy and job performance.
- Having consistent MSRPH Operating Rules eliminates confusion regarding proper vehicle speed and promotes safety.
- Having an established process for preparing, reviewing, approving and disseminating the MSRPH helps prevent inconsistencies and reinforces safety for personnel working in or around the Metrorail system.
- Updating MSRPH SOP 29 to include all personnel in the Blue Flag Protection would reduce accidents and reinforce safety.
- Expand the current Advance Mobile Flagger (AMF) process to include a scenario to follow when flagging at stations with a center (pocket) track situated between the platforms.
- Creating a documented procedure for all personnel to follow when accessing track in rail yards and within Class 1 and Class 2 vehicle maintenance facilities provides verification that all personnel are aware of the associated hazards within yards and equipment shops.
- Having a completed and a secure confidentiality agreement helps protect WMATA and its employees' information and preserves WMATA's interest.

Required Actions:

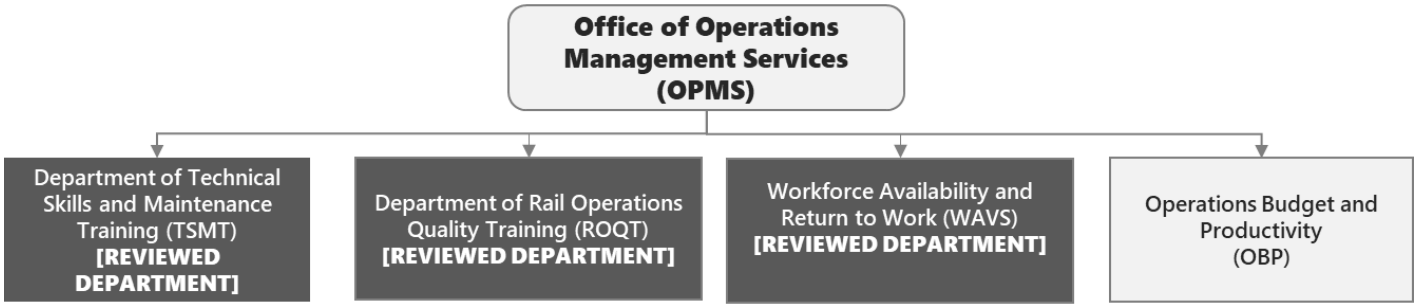
- **QICO-OPMS-21-01:** Develop, revise and implement documentation to advocate compliance with the SSPP and departmental SOPs.

Note: An itemized internal Corrective and Preventive Action (iCAPA) is developed for each required action to achieve effective and measurable resolution of identified concerns. To check the status of iCAPA implementation go to https://www.wmata.com/initiatives/transparency

12.1. FUNCTIONAL OVERVIEW AND STRUCTURE

Office of Operations Management Services

The Office of Operations Management Services (OPMS) is responsible for management support throughout Washington Metropolitan Area Transit Authority (WMATA) ensuring departments have the resources they need to perform their jobs effectively. OPMS oversees four (4) main sub-departments: Technical Skills and Maintenance Training (TSMT), Rail Operations Quality Training (ROQT), the Office of Workforce Availability and Return to Work (WAVS), and Operations Budget and Productivity (OBP).



Of these sub-departments, TSMT, ROQT, and WAVS were found to have functions applicable to this Internal Safety Review. The primary function of TSMT and ROQT is to provide training to WMATA employees and contractors who work in rail operations and maintenance. WAVS monitors long and short-term attendance for the authority, assisting each department to manage their manpower requirements.

Additionally, ROCC training was not included in the ROQT assessment due to the current review and modification of the program to continually improve efficiency and effectiveness. The current revamp of ROCC training is a response to the WMSC audit findings and required corrective actions from the report issued on May 12, 2020 and the final audit report issued September 8, 2020.

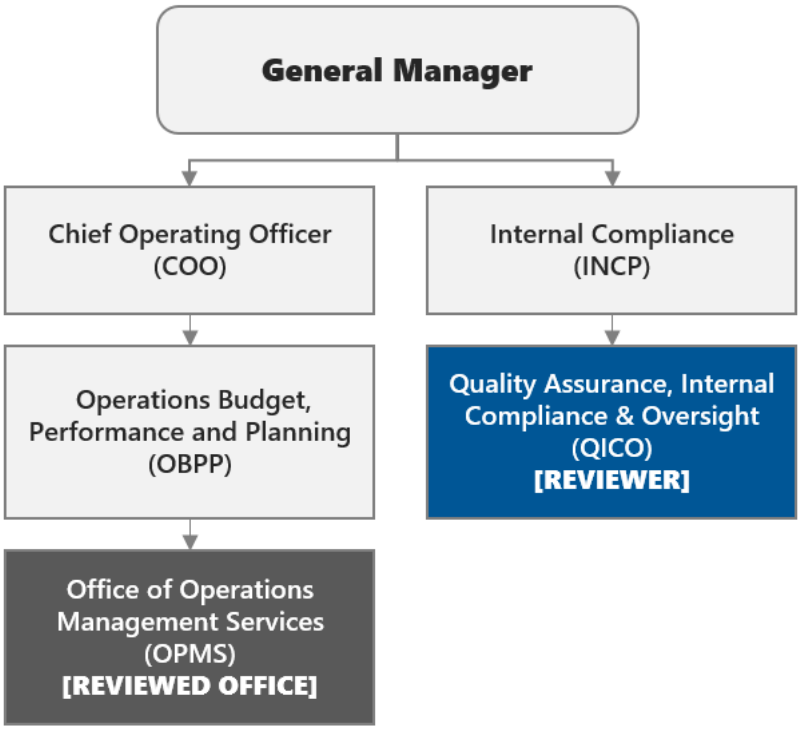
The objective of the OPMS Internal Safety Review (ISR) is to internally evaluate the safety of routine operations, new projects, systems, and training in accordance with WMATA's System Safety Program Plan (SSPP). The SSPP is the authority-wide safety plan created by the Department of Safety & Environmental Management (SAFE) in accordance with Federal Transit Administration (FTA) guidelines (49 CFR 674). The SSPP outlines WMATA's approach to satisfy the 21 required system safety elements to maintain a safe, reliable and effective transit system.

WMATA SSPP includes 21 elements. Out of the 21 SSPP Elements, OPMS was assessed upon 10 of the applicable elements:

- SSPP Implementation- Tasks and Activities (Element 5)
- Hazard Management Program (Element 6)
- Safety Data Acquisition (Element 9)
- Accident/Incident Notification, Investigation and Reporting (Element 10)
- Emergency Management (Element 11)
- Rules and Procedures Compliance and Review (Element 13)
- Facilities and Equipment Inspections (Element 14)
- Training Certification Review/Audit (Element 16)
- Local, State and Federal Requirements (Element 18)
- Hazardous Materials (Element 19)

Organizational Structure and Background

The Office of Quality Assurance, Internal Compliance and Oversight (QICO) conducted an Internal Safety Review of OPMS during the first quarter of fiscal year 2021 (July – September 2020). OPMS is a sub-department of the Office of Operations Budget, Performance and Planning (OBPP), which reports to the Chief Operating Officer (COO). As shown in the organization chart, QICO is independent of this function, reporting to the General Manager through Internal Compliance (INCP).



12.2. REVIEW SCOPE

Documentation Review

- WMATA System Safety Program Plan (SSPP), (January 2018)
- TSMT Organization Chart, (August 2020)
- ROQT Organization Chart, (May 2020)
- SOP – Operations Management Services Procedures, (January 2020)
- SOP – Roadway Worker Protection Training (RWPT), (July 2020)
- SOP – Track Inspector Training Program, (May 2020)
- SOP – TSMT Promotional Testing, (September 2019)
- SOP – ROCC Controller Annual Certification/Re-Certification Program, (April 2020)
- SOP – Equipment Operator Training, (July 2020)
- SOP – Station Manager Certification Training Program, (January 2020)
- SOP – COO Operating Overtime Management, (March 2017)
- SOP 1.17 – Managing Personnel and Work Assignments in Rail Yards, (February 2020)
- SOP 29 – Blue Flag Protection – Storage Tracks, Shop, Shop Leads and Yards, (April 30, 2020)
- Metrorail Safety Rules and Procedures Handbook (MSRPH), (August 2020)
- WMATA COOP Plan, (February 2020)
- Executive Safety Committee Meeting Minutes, (April, March, and May 2020)
- TSMT Meeting Agenda, (April 14, 2020 – June 30, 2020)
- MSRPH Meeting Minutes, (May 13, 2020 – August 19, 2020)
- Carmen Turner Facility (CTF) Safety Committee Meeting Minutes, (March, May, and July 2020)
- OPMS ELM Reports for TSMT and ROQT Personnel (29) – Training Records, (No date)
- Car Equipment Training Instructor Job Description 3711, (February 2020)
- Systems Training Instructor Job Description 3713, (April 2015)
- Technical Skills Maintenance Training Instructor Job Description 3717, (February 2020)
- Track and Structures Training Instructor Job Description 3724, (February 2020)
- Elevator-Escalator Training Instructor Job Description 3725, (February 2020)
- Rail Training Instructor Job Description 3748, (December 2013)
- Technical Skills Program Coordinator Job Description 5825, (February 2020)
- Training Matrix TSMT, (No date)
- Training Matrix ROQT, (July 2020)
- Apprentice Program Brochure ELES, (March 2020)
- Apprentice Program Brochure TRPM, (March 2020)
- Apprentice Program Brochure Major Repair and Overhaul, (March 2020)
- Apprentice Program Brochure Service and Inspection, (No date)
- WAVS Confidentiality Agreements (No date)
- WAVS SOP (March 2020)

Personnel Discussions

- Director of TSMT (August 26, 2020)
- Director of ROQT (August 25, 2020)
- Director of WAVS (November 2, 2020)
- Assistant Director of ROQT (August 25, 2020)
- (2) Managers of Operations Training TSMT (August 26, 2020)
- (4) Instructors ROQT
- (7) Instructors TSMT

Field Assessments

- Structural Evaluation Technician Course Assessment (August 26-27, 2020)
- Station Manager Refresher Course Assessment (September 3, 2020)
- Roadway Worker Protection (RWP) Level 4 Requalification Course Assessment (September 8, 2020)
- Rail Operations Supervisor (ROS) Refresher Course Assessment (September 10, 2020)
- T-20-31 Power Restoration Verification Course Assessment (September 21, 2020)

12.3. WHAT WORKED WELL (WINS)

Wins are categorized by the System Safety Measures and rated by the Risk Assessment

W-OPMS-21-01 Safety, Training and Certification **Reduces Safety Risk Owner – OPMS**

✓ **Technical Skills and Maintenance Training (TSMT) has developed and implemented a comprehensive system to regularly maintain a less than one percent RWP "Out of Compliance" status on a monthly basis.**

Discussion

In 2015, the Federal Transit Administration (FTA) issued multiple Corrective Action Plans (CAPs) following their assessment of WMATA's RWP training program which found that approximately 1780 individuals were noted as being "Out of Compliance" with the annual RWP training.

- QICO noted the following during document review and interviews with TSMT personnel:
  - TSMT maintains a detailed log showing WMATA personnel who are Out of Compliance for the training. Weekly emails are sent out to WMATA supervisory personnel detailing:
    - Employees due for the training in the next two months.
    - Employees due for the training in the next six months.
    - Employees Out of Compliance for the training.
  - A system is in place to communicate to personnel through email the status and prompt them to enroll in the necessary (annual or bi-annual) refresher training to maintain RWP compliance.

As a result of these changes, the number of Out of Compliance personnel went from approximately 1780 in early 2015 to an average of 47 out of compliance starting in June of 2016 to present (Figure 1).

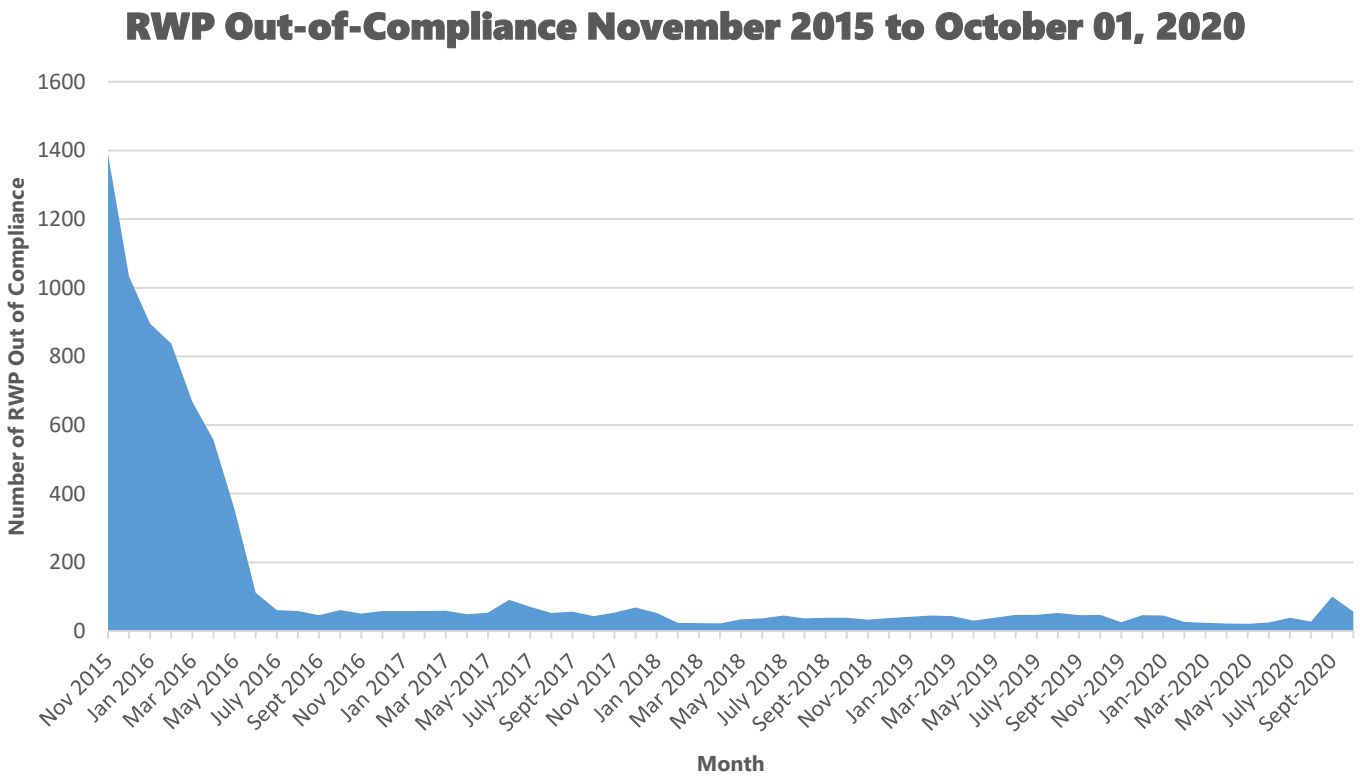


Figure 1

W-OPMS-21-02 Safety, Training and Certification **Reduces Strategic Risk Owner – OPMS**

✓ **Technical Skills and Maintenance Training (TSMT) Apprentice Programs add value to the organization by providing highly skilled training in specialized fields that would not typically be practical to recruit for.**

Discussion

After the initiation of the Elevator Escalator (ELES) Apprentice Program in early 2000, TSMT has developed three additional Apprentice Programs one for Traction Power Maintenance (TRPM) and two for Car Maintenance (CMNT): Major Repair and Overhaul (MRO) and Service and Inspection (S&I).

- These in-house comprehensive training programs are conducted over a 2-year period and designed for newly hired employees (both internal and external) in specialized fields, which would not be practical to recruit for.

12.4. ITEMS RESOLVED DURING REVIEW

Items resolved are categorized by System Safety Measures

R- OPMS-21-01 Job Safety **Owner – OPMS**

✪ **Following established formal compliance check program validates training is delivered according to established rules, policies and procedures.**

Discussion

A compliance check program promotes a culture of safety and aids in thorough implementation of safety rules and procedures. It is especially important in safety sensitive field-based settings such as the SET course and Class 2 Vehicle Operator Training.

- Per Operations Management Services SOP (January 2020) Section 10.2.4, OPMS Training Supervisors must conduct quarterly audit of their staff and provide feedback on the observed performance with the classroom/lab environment through the utilization of the Instructor Evaluation Form.
- QICO conducted document review and interviews with the instructors and noted the following:
  - Instructor Evaluation Forms included multiple evaluations of Computer Based Training (CBT) courses.
  - Three (3) out of six (6) TSMT completed evaluation forms were of the same instructor.
- On July 7, 2020, QICO requested records of completed quarterly audits and completed Instructor Evaluation Forms from TSMT and ROQT. QICO received the completed forms on October 30, 2020.

12.5. AREAS FOR IMPROVEMENT

Findings are categorized by System Safety Measures and rated by the Risk Assessment

FS-OPMS-21-01 Safe Work Standards **Safety – Low (2, 3)** **Owner – OPMS**

- **Creating and instituting documentation of all System Safety Program Plan (SSPP) required plans and documents promotes a strong safety culture.**

Discussion

The SSPP identifies required safety related documents and plans to facilitate departmental safety execution during situations that require action.

- While evaluating OPMS submitted documents, QICO noted the following required SSPP documents were missing:
  - OPMS Emergency Contact List (SSPP Element 11)
- Additionally, the TSMT Training Matrix submitted to QICO does not have a revision number or date. Per SSPP 16.1, "It is the responsibility of each department head or their designee to develop and maintain a required training matrix for each position and employee within their department and to verify that the matrix is kept current."

FS-OPMS-21-02 Document Control **Service Delivery – Low (2, 3)** **Owner – OPMS**

- **Using designated share drive to store and access the latest controlled document reduces the risk of disseminating obsolete information.**

Discussion

Having a portable device such as a Universal Serial Bus (USB) without password protection to store and upload course materials introduces the risk that the course material being presented may be different than the most current revision. Having training materials saved in centralized location reduces this risk.

- QICO assessed TSMT document control process through discussions and interviews with TSMT personnel and noted:
  - TSMT has a centralized repository where current documents are available to TSMT personnel. These course materials are locked for editing.
- QICO assessed ROQT Rail Operations Supervisor Refresher training course on September 10, 2020 and noted the following:
  - The instructors were uploading the training course Power Point presentations from a removable USB and not from a secured location such as the network drive. Per OPMS SOP 9.7.1 "OPMS shared Management drive will be used as the repository for all OPMS Training documents and courseware for both ROQT and TSMT."
  - Although the course was the current version (Rev. 12), all course material should be located on a shared drive and locked for editing to maintain proper document control.
  - It was also noted that in one course assessment, the document contained on the instructor's USB drive was not locked for editing. Per OPMS SOP 9.7.2 "The OPMS Training Directors are designated as the custodian for OPMS curriculum and are responsible for ensuring that all material developed is original and not copied from outside sources."
- To maintain proper document control and ensure all courses are being taught to the most current revision of course material, OPMS needs to develop and implement a formal document control process for the network drive.
- Per SSPP Section 13, Supervisors are required to verify that employees perform their assigned duties in compliance with OAPs and other procedures and instructions.

FS-OPMS-21-03 Document Control **Safety – Low (2, 2)** **Owner – OPMS**

- **Revising the Roadway Worker Protection (RWP) training course to include the Hazardous Concern Form as referenced in the RWP SOP (January 2020) promotes a culture of safety in the classroom and on the job.**

Discussion

While personnel are taking the Roadway Worker Protection Course Level 1, 2 or 4, there may be an instance of personnel becoming aware of a hazardous condition while engaged in RWP training. If this should occur, TSMT has created a Roadway Worker Protection Training (RWPT) Hazardous Concern Form to be used.

- During a review of RWP course assessments and interviews, QICO noted that TSMT does not have a Hazardous Concern Form available for trainees to complete when taking the RWP courses as specified in the RWP SOP Section 5.3.3.
- On September 8, 2020, QICO attended RWP Level 4 Requalification Course and noted that the RWPT Hazardous Concern Form was not available for students during the course.
- Per SSPP Section 6.2.1, Hazard Identification: Identification of hazards is the responsibility of all departments / offices /branches and individual employees and continuous management of hazards is the key to an effective system safety program.

FS-OPMS-21-04 Safe Work Standards **Safety – Low (2, 2)** **Owner – OPMS**

- **Updating WAVS SOP to include both controlled documentation of completed random checks and appropriate controls for remote access to confidential information reduces risks to WMATA and WMATA personnel.**

Discussion

Having controls in place for physical and remote random checks of WAVS' handling of confidential information safeguards WMATA personnel's safety sensitive information (e.g. Financial, Medical, and Personal Identifiable Information (PII)) and strengthens data security.

- Following documents' reviews and interviews, QICO noted:
  - Management routinely conducts physical audits of personnel work spaces to verify compliance with WAVS SOP Ver 1.1. However, there are no records (e.g. checklists) of these random checks.
  - With the temporary full-time teleworking setup, no random checks have been conducted. There was an update to the WAVS SOP to include teleworking guidelines, March 16, 2020; however, there is no process in place to control printing or copying any sensitive information.
  - Per WAVS SOP Section 2.4 random checks of team members' workspace are done to ensure sensitive information is appropriately stored and disposed of.
- Per SSPP 14 Safety Inspections of WMATA's facilities are made by supervisors, safety officers and managers, to detect and correct unsafe conditions for employees. Examples of inspected support facilities include administrative buildings. Additionally, SSPP Section 14.4, Checklists are developed from procedures, manuals, standards and manufacturers' manuals and are used to perform and document the inspections.

12.6. SUPPLEMENTARY GUIDANCE – QUALITY BUSINESS PRACTICES

The following item(s) are not part of the reviewed governing documentation and will not be included into the official corrective action plans. By addressing these items, the department may experience an overall benefit.

G-OPMS-21-01 Application & Fulfillment **Will Reduce Safety Risk** **Owner – OPMS**

- **Periodically updating OPMS job descriptions to comply with Human Resources (HR) procedure fulfills qualifications' accuracy and job performance.**

Discussion

Having current and accurate job descriptions facilitates the effective recruitment and fulfillment of open positions.

- QICO requested a sample of job descriptions and noted the following:
  - The Systems Training Instructor job description has a revision date of April 2015.
  - The Rail Training Instructor job description has a revision date of December 2013.
- Per HR-TA-P02-00, a job description should be reviewed and evaluated with the Office of Compensation (COMP) minimally every three years to ensure relevance and accuracy of the minimum qualifications, essential functions, knowledge, skills, abilities and technology/tools.

G-OPMS-21-02 Job Safety **Will Reduce Safety Risk** **Owner - SAFE**

- **Having consistent MSRPH Operating Rules eliminates confusion regarding proper vehicle speed and promotes safety.**

Discussion

The revised Operating Rule 3.27 (From T-17-03) gives a maximum speed of 10 mph or less for a Class 1 vehicle that has been operated in Mode 3 while the Operating Rule 3.97 references a speed of 25 mph when operating from other than the leading end on the mainline (also operating in Mode 3).

- Based on document review and interviews with ROQT personnel, QICO noted an inconsistency between the revised Operating Rule 3.27 and Operating Rule 3.97 on maximum authorized speed.

G-OPMS-21-03 Document Control **Will Reduce Safety Risk** **Owner - SAFE**

- **Having an established process for preparing, reviewing, approving and disseminating the MSRPH helps prevent inconsistencies and reinforces safety for personnel working in or around the Metrorail system.**

Discussion

The MSRPH is WMATA's governing document that dictates safety culture and operation throughout the organization. Given the importance of the MSRPH and its direct application to safety at WMATA, following a revision control process eliminates errors and confusion.

- QICO reviewed three (3) revisions of MSRPH dated November 1, 2018, May 29, 2020, and August 28, 2020 and noted the following in all three (3) revisions:
  - Signature pages were not updated and have the same signatures dated 2010 from inactive WMATA employees.
  - Preface page was not updated and cites January 2004 as the previous revision date.
  - The footers are inconsistent and refer to different versions.

G-OPMS-21-04 Safe Work Standards **Will Reduce Safety Risk** **Owner – SAFE**

- **Updating MSRPH SOP 29 to include all personnel in the Blue Flag Protection would reduce accidents and reinforce safety.**

Discussion

Blue Flag Protection is a series of rules and procedures established to protect personnel who are engaged in the inspection, testing, repair and servicing of rolling equipment (Passenger Cars or other rail bound equipment) and whose activities require them to work on, under or between such equipment. The nature of this work would subject them to the danger of personal injury posed by any movement of this equipment (Figure 2).

A blue flag is placed in front of, behind, and in the operating cab of a rail vehicle to indicate that workers are around or under the rail vehicle. When the flag is displayed, the rail vehicle cannot be moved or coupled to (*Images are taken from the Internet and are not proprietary to WMATA).*

Figure 2
Blue Flag Protection

- QICO noted the following during document review of MSRPH SOP 29 and interviews with TSMT personnel:
  - Blue Flag Protection training is currently provided to only the Office Car Maintenance (CMNT), Car Truck Maintenance Equipment (CTEM), and Kawasaki personnel.
  - While the employees mentioned above may constitute the majority of WMATA personnel needing the Blue Flag Protection training, it leaves out other crafts such as the Structural Evaluation Technician (SET) whose duties involve inspecting structures in shops while equipment is still on the tracks.
  - The lack of Blue Flag Protection training may increase the risk for injury while performing activities on the tracks with potential equipment movement.
  - Per CFR 49 Part 218.21 "This subpart prescribes minimum requirements for the protection of railroad employees engaged in the inspection, testing, repair, and servicing of rolling equipment whose activities require them to work on, under, or between such equipment and subjects them to the danger of personal injury posed by any movement of such equipment."
- Having a standardized process for all personnel working on or around equipment protected under Blue Flag Protection would minimize safety risks.

Additionally, Blue Flag Protection protects personnel who are working within the dynamic envelope of a piece of rail bound equipment. (Figure 3 -4)

- QICO noted the following during document review and interviews with TSMT personnel:
  - While MSRPH SOP 29 includes a process for personnel regarding remote operated switches (controlled by the Yard Tower), there is no process regarding lining and locking a hand throw switch against movement into the track which is under Blue Flag Protection.
  - CTEM employees line the associated hand throw switch against movement into the track they are working on; however, the switch is not locked in that position to prevent the switch from being thrown back.
  - Per CFR Title 49 Part 218 "Each manually operated switch providing access to the track on which the equipment is located must be lined against movement to that track and locked with an effective locking device".
- Revising MSRPH SOP 29 to require all types of switches be lined and locked against movement into a track protected under Blue Flag would help properly protect personnel.

G-OPMS-21-04 Safe Work Standards **Will Reduce Safety Risk** **Owner – SAFE**

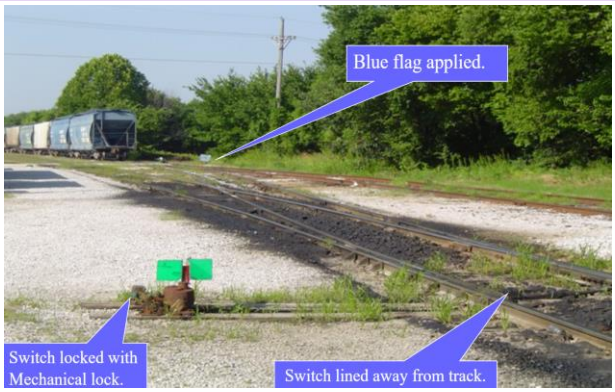


Figure 3
Blue Flag Protection

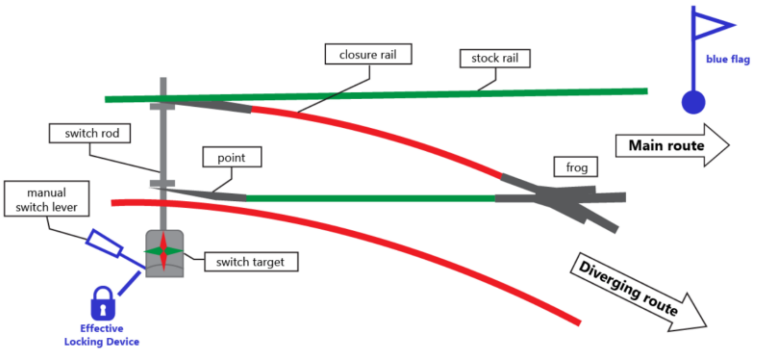


Figure 4
Blue Flag Protection

G-OPMS-21-05 Safe Work Standards **Will Reduce Safety Risk** **Owner – SAFE**

- **Expand the current Advance Mobile Flagger (AMF) process to include a scenario to follow when flagging at stations with a center (pocket) track situated between the platforms.**

Discussion

The majority of the rail stations at WMATA have a simple two track layout, with inbound track and outbound track on either side of a center platform (Figure 5) and split platform (Figure 6). There are two stations (West Falls Church and National Airport) that have a third track, typically called a pocket track that bisects the platform through the center (Figure 7). This third track is used for rail vehicle storage and also provides a third option for rail vehicles to traverse through the station.

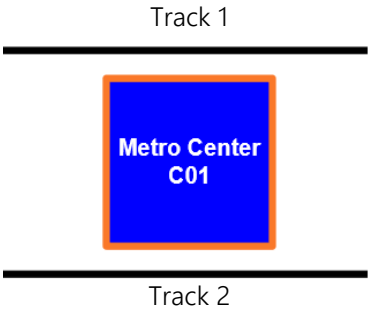


Figure 5
Center Platform, Metro Center Station

Figure 6
Split Platform, Cheverly Station

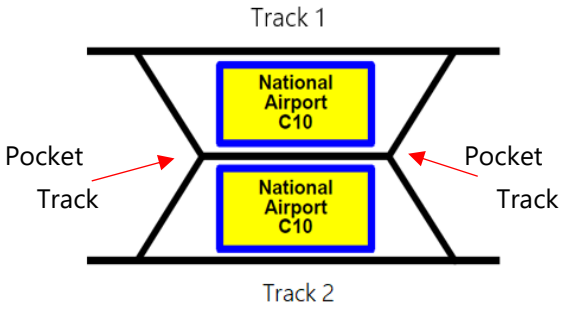


Figure 7
Split Platform with Pocket Track, National Airport Station

- QICO noted the following during document review and interviews with TSMT personnel:
  - The MSRPH Roadway Worker Protection (Section 5) and the RWP Quick Access Guide have specific instructions for AMF working at a terminal station where train movement can begin from Track 1 or Track 2. The AMF is required to have two (2) AMF set-ups placed on both sides of the platform.
  - An AMF flagging at a station with a pocket track on Track 1 or Track 2 could also see rail vehicle movement on the pocket track, thus seeing similar traffic flow as a terminal station. Despite this similarity, there is currently no provision for the AMF to have two set-ups when flagging at a station with a pocket track.
  - An AMF who is flagging for a work crew that is working beyond the convergence of these two tracks is not currently able to protect the work crew should a Class 1 or Class 2 vehicle enter and exit the station through the pocket track.
- Revising the MSRPH Section 5 and the RWP Quick Access Guide to require the AMF to have two set-ups when working at stations with pocket tracks helps protect personnel on the roadway when/if a Class 1 or Class 2 vehicle enters a station with a pocket track.

G-OPMS-21-06 Safe Work Standards **Will Reduce Safety Risk** **Owner – SAFE**

- **Creating a documented procedure for all personnel to follow when accessing track in rail yards and within Class 1 and Class 2 vehicle maintenance facilities provides verification that all personnel are aware of the associated hazards within yards and equipment shops.**

Discussion

Performing an inspection within a Class 1 or Class 2 vehicle maintenance facility presents a unique set of risks and hazards to personnel which can include rail vehicle movement, equipment movement and electrical hazards. This is compounded when personnel are not exposed to inspecting in this environment on a regular basis. (SSPP Element 16)

- QICO noted the following during document review and interviews with TSMT personnel:
  - During a review of the introductory course for Structural Evaluation Technicians (SET), it was revealed that SETs and all other employees are not trained on inspecting on or about tracks within the maintenance facility. Without a standardized procedure across all departments this leads to inconsistencies in work practices and exposes workers to unnecessary risks associated with unintentional rail vehicle contact.
  - Per CFR Title 49 Part 214.318:
    - Any work performed within the limits of a locomotive servicing or car shop repair track area with the potential of fouling a track which requires a person qualified under § 213.7 (Track Safety Standards) of this chapter to be present to inspect or supervise such work must be performed in accordance with the requirements of this subpart.

Additionally, the set of rules and procedures that govern the types of track access at WMATA are covered in the MSRPH Section 5. MSRPH defines the four types of track protection personnel available to properly access mainline track at WMATA:

- Advance Mobile Flagger (AMF) Watchman Lookout: An AMF is positioned at a station to notify incoming Class 1 and Class 2 vehicles that personnel are present on the roadway ahead. This type of protection is generally used for the purpose of track inspection.
- Foul Time (FT): A method of RWP in which a qualified Level 2 or Level 4 Roadway Worker requests that the Rail Operations Control Center (ROCC) stop all rail vehicle movement in a specific area for a limited amount of time, typically by changing track lunars from white (proceed) to red (stop) to prevent train operators from entering the FT area.
- Exclusive Track Occupancy (ETO: Personnel use shunts to show the track as occupied and prevent a Class 1 vehicle from entering the area where work is being performed. This type of protection is generally used for shorter term work.
- Inaccessible Track (IT): This method of protection uses a derail, locked switch or other barrier to prevent rail vehicle movement into the area where work is being performed. This type of protection is generally used for longer term work.

It should be noted that Individual Train Detection (ITD), or Lone Worker is not to be used as a sole means of track protection on the mainline at WMATA according to the MSRPH section 5.13.4. As the name implies, ITD is accomplished by a single individual who maintains constant lookout for rail vehicle movement and awareness of the proper sight distances needed to clear the tracks within 15 seconds of an oncoming rail vehicle.

  - In CFR Title 49 Part 214 which covers track safety for railroad workers the methods of track protection for non-controlled (which covers yards) tracks are as follows:
    - IT Protection
    - Train Approach Warning provided by watchmen/lookouts
    - Individual Train Detection or Lone Worker
- QICO noted the following during interviews with TSMT personnel:
  - Other than IT protection, there is no formal documented procedure in place to protect personnel working on or about tracks with no equipment in the maintenance facility. Just like the main line where vehicle movement can occur at all times and in any direction, the rail yards and facilities are subject to similar hazards and therefore additional forms of protection should be applied.

Updating the MSRPH to include rail yards and maintenance facilities enhances safety coverage of all of WMATA's tracks.

G-OPMS-21-07 Safe Work Standards **Will Reduce Safety Risk Owner– OHAW**

- **Having a completed and a secure confidentiality agreement helps protect WMATA and its employees' information and preserves WMATA's interest.**

Discussion

Legally binding documents should be signed with adequate security measures to prevent modifications which would alter the intent and preservation of the record.

- QICO reviewed documents submitted by WAVS and noted:
  - 33% of WAVS confidentiality agreement signatures were editable documents and had typed signatures. IT has directions for setting up digital signatures in multiple programs that are accessible to WMATA personnel.
  - All submitted documents were missing OHAW management signatures.
- These safety and security sensitive documents need to be securely documented before signing.
- Per SSPP Section 17, a configuration Management Plan is vital to WMATA to verify, as much as possible, that the configuration of all WMATA property, vehicle, equipment and systems design elements, operations and maintenance documents, and safety and security documents are accurately and completely documented.

12.7. SUMMARY OF REQUIRED ACTIONS

QICO-OPMS-21-01 **Action Owner – OPMS** **Overall Risk – Low** (Average Score)

Required Action: Develop, revise and implement documentation to advocate compliance with the SSPP and departmental SOPs.

Applicable Findings

- **FS-OPMS-21-01: Creating and instituting documentation of all System Safety Program Plan (SSPP) required plans and documents promotes a strong safety culture.**
  - **Standard:** Safe Work Standards **Risk:** Safety – Low (IMP 2, PROB 3)
- **FS-OPMS-21-02: Using designated share drive to store and access the latest controlled document reduces the risk of disseminating obsolete information.**
  - **Standard:** Document Control **Risk:** Service Delivery – Low (IMP 2, PROB 3)
- **FS-OPMS-21-03: Revising the Roadway Worker Protection (RWP) training course to include the Hazardous Concern Form as referenced in the RWP SOP (January 2020) promotes a culture of safety in the classroom and on the job.**
  - **Standard:** Hazard Management **Risk:** Safety – Low (IMP 2, PROB 2)
- **FS-OPMS-21-04: Updating WAVS SOP to include both controlled documentation of completed random checks and appropriate controls for remote access to confidential information reduces risks to WMATA and WMATA personnel.**
  - **Standard:** Safe Work Standards **Risk:** Safety – Low (IMP 2, PROB 2)

Internal Corrective and Preventive Actions (iCAPAs) are designated to address each Required Action listed above.

INTERNAL CORRECTIVE AND PREVENTIVE ACTION (iCAPA)

STRUCTURE GROUT PAD RENEWAL (SGPR) iCAPA

Return to Summary of Required Actions

INTERNAL REVIEW

Engineering & Maintenance

In response to the internal review report regarding Grout Pad Renewal, the Office of Engineering and Architecture, the Office of Maintenance of Way Engineering, the Office of Track and Structures, and the Office of Quality Assurance Internal Compliance & Oversight (QICO) have coordinated the development of four (4) iCAPAs. The iCAPAs have been developed to address required actions and the associated findings.

EXECUTIVE LEADERSHIP OF RESPONSIBLE PARTIES

Internal Corrective and Preventive Action (iCAPA) Commitment

[redacted]

Joseph Leader *Date*
Executive Vice President & Chief Operating Officer

[redacted]

Laura Mason *Date*
Executive Vice President, Capital Delivery

WMATA INTERNAL OVERSIGHT

Internal Corrective and Preventive Action (iCAPA) Commitment

[redacted]

Hakim Davis *Date*
Vice President, Quality Assurance, Internal Compliance & Oversight (QICO)

[redacted]

Eric Christensen *Date*
Executive Vice President, Internal Compliance (INCP)

[redacted] 12/18/20

Paul J. Wiedefeld *Date*
General Manager & Chief Executive Officer (GM/CEO)

PURPOSE AND SCOPE

On September 24, 2020, the Office of Quality Assurance, Internal Compliance & Oversight (QICO) issued the Grout Pad Renewal Internal Review report. This internal Corrective and Preventive Action (iCAPA) is developed to address associated findings and required action for **QICO-SGPR-21-01**.

FINDINGS

FQ-SGPR-21-01: Developing a process to define roles and responsibilities between ENGA, MOWE, and TRST would establish consistent accountability and support of design, maintenance, and repair.

FQ-SGPR-21-05: Alignment of governing documentation and issuance of consistent standards and work instructions would minimize confusion and improve efficiency.

REQUIRED ACTION

QICO-SGPR-21-01	***Maintenance of Way Engineering (MOWE)***	*Risk:* High	

Develop and submit roles and responsibilities of ENGA, MOWE, TRST and SAFE for grout pad reconstruction and controlled document material approval process.

Measure: Design Control *Risk Category:* Service Delivery *(5, 4)*

ACTION PLAN OVERVIEW

ENGA, MOWE and TRST will develop a process to include roles and responsibilities matrix and consistent work instructions that align with design specification.

Business Impact – Budget/Cost Estimate: Operating

Process Improvement – A current process/procedure needs to be optimized to address the Required Action(s). This type of initiative does not need additional resources because current manpower will be used to improve the process.

Actionable Items		Description	Responsible Party[1]	Est Start[2]	Est End[3]
1.	Roles and Responsibility	ENGA and MOWE will develop and submit a written process defining roles and responsibilities of ENGA, MOWE, and TRST for grout pad reconstruction. MOWE to submit a roles and responsibility matrix.	**Tom Robinson (ENGA) Sariah TambreLeigh (MOWE)**	10/13/20	03/16/21
2.	Materials Control	MOWE will develop and submit a documented process for grout pad reconstruction material requests and approval of such requests.	**Sariah TambreLeigh (MOWE)**	11/18/20	03/16/21
3.	Grout Pad Reconstruction Design Specifications	MOWE will update specifications of grout pad reconstruction to include testing requirements and interpreting results. MOWE to submit revised specifications.	**Tom Robinson (ENGA) Ravi Amin (MOWE)**	11/18/20	05/18/21
4.	Document List	MOWE and TRST will perform a comparison of work instructions and design specifications related to grout pad reconstruction activities to ensure alignment and consistency. MOWE and TRST will submit a list of inconsistencies among various work instructions and design specifications related to grout pad reconstruction.	**Ravi Amin (MOWE) Joseph Fowler (TRST)**	11/18/20	05/18/21
5.	Revision of Work Instructions	MOWE and TRST will revise and submit work instructions as indicated in Actionable Item #4 to eliminate inconsistencies.	**Ravi Amin (MOWE) Joseph Fowler (TRST)**	11/18/20	05/18/21
6.	QICO CAP Verification Report	QICO will evaluate actionable items submitted to confirm there is reasonable evidence that the findings and this required action have been resolved, taking into account the actionable item descriptions and performance measures.	**QICO**	05/18/21	06/22/21

PERFORMANCE MEASURES

None

[1] In the event of personnel or departmental changes, responsibilities for actionable items shall transfer to the new leadership.

[2] Est Start – Estimated Start Date.

[3] Est End – Estimated Completion Date.

[4] Offices designated as supporting roles provide subject matter expertise to responsible parties during action development and are not directly responsible for delivery of actionable items listed above.

RESPONSIBLE PARTIES

ENGA	Thomas Robinson	[redacted] (Signature/Date)
MOWE	Sariah TambreLeigh	[redacted] (Signature/Date)
MOWE	Ravi Amin	[redacted] (Signature/Date)
TRST	Joseph Fowler	[redacted] (Signature/Date)

SECOND-LEVEL RESPONSIBILITY

ENGA	Nichalos Gardner	[redacted] (Signature/Date)
RIME	Michael Hass	[redacted] (Signature/Date)

PURPOSE AND SCOPE

On September 24, 2020, the Office of Quality Assurance, Internal Compliance & Oversight (QICO) issued the Grout Pad Renewal Internal Review report. This internal Corrective and Preventive Action (iCAPA) is developed to address associated finding and required action for **QICO-SGPR-21-02**.

FINDING

FQ-SGPR-21-02: Adhering to the established construction materials inspection and testing requirements would satisfy compliance with concrete strength and other specifications.

REQUIRED ACTION

QICO-SGPR-21-02	***Office of Track and Structures (TRST)***	*Risk:* High	

Enforce the implementation of the established construction inspection sampling and testing standards.

Measure: Inspection, Testing & Status *Risk Category:* Service Delivery *(4, 5)*

ACTION PLAN OVERVIEW

TRST will document and provide completed Quality Assurance/ Quality Control (QA/QC) checklist and engineering reviews for grout material testing.

TRST/MOWE will develop anchor stud pull-out testing process to include identifying and training technicians tasked to perform testing with the acquired material testing equipment.

Business Impact – Budget/Cost Estimate: Operating

Process Improvement – A current process/procedure needs to be optimized to address the Required Action(s). This type of initiative does not need additional resources because current manpower will be used to improve the process.

Actionable Items		Description	Responsible Party[1]	Est Start[2]	Est End[3]
1.	Documented evidence of contract agreement	TRST will submit the contract agreement with independent laboratory for grout material testing.	**Joseph Fowler (TRST)**	01/12/21	06/15/21
2.	Documented evidence of sampling and completed QA/QC	TRST will submit documented evidence of sampling and testing of grout pad materials and provide completed Quality Assurance/ Quality Control (QA/QC) checklist in accordance with the work Instructions requirements.	**Joseph Fowler (TRST)**	01/12/21	06/15/21
3.	Documented evidence of engineering review of testing	MOWE and TRST to submit documented evidence of test results reviewed by engineering.	**Ravi Amin (MOWE) Joseph Fowler (TRST))**	01/12/21	06/15/21
4.	Grout Pad Reconstruction Work Instruction	MOWE will update and submit the existing work instruction that defines the minimum length of grout pad reconstruction that requires anchor stud pull-out testing.	**Ravi Amin (MOWE) Joseph Fowler (TRST)**	10/13/20	03/17/21
5.	Stud Pull-Out Testing Process	MOWE will develop and submit a written process for anchor stud pull-out testing.	**Ravi Amin (MOWE) Joseph Fowler (TRST)**	10/13/20	03/17/21
6.	Test Equipment	Specify and provide proof of acquired anchor stud pull-out test equipment.	**Ravi Amin (MOWE) Joseph Fowler (TRST)**	11/10/20	03/16/22
7.	Identify and train personnel	Identify and conduct training to personnel performing anchor pull-out testing and submit training records.	**Ravi Amin (MOWE) Joseph Fowler (TRST)**	11/10/20	03/16/22

[1] In the event of personnel or departmental changes, responsibilities for actionable items shall transfer to the new leadership.

[2] Est Start – Estimated Start Date.

[3] Est End – Estimated Completion Date.

[4] Offices designated as supporting roles provide subject matter expertise to responsible parties during action development and are not directly responsible for delivery of actionable items listed above.

Actionable Items		Description	Responsible Party[1]	Est Start[2]	Est End[3]
8.	QICO CAP Verification Report	QICO will evaluate actionable items submitted to confirm there is reasonable evidence that the findings and this required action have been resolved, taking into account the actionable item descriptions and performance measures.	**QICO**	03/16/22	04/15/22

PERFORMANCE MEASURES

TRST to provide six (6) months of completed Quality Assurance/ Quality Control (QA/QC) checklists with the test results per Actionable Item #2

TRST to provide six (6) months of engineering review of test results per Actionable Item #3

MOWE/TRST to provide 100% of completed anchor stud pull-out testing training records of active identified technicians as per Actionable Item #7

[1] In the event of personnel or departmental changes, responsibilities for actionable items shall transfer to the new leadership.

[2] Est Start – Estimated Start Date.

[3] Est End – Estimated Completion Date.

[4] Offices designated as supporting roles provide subject matter expertise to responsible parties during action development and are not directly responsible for delivery of actionable items listed above.

RESPONSIBLE PARTIES

TRST	Joseph Fowler	[redacted] (Signature/Date)
MOWE	Ravi Amin	[redacted] (Signature/Date)

SECOND-LEVEL RESPONSIBILITY

RIME	Michael Hass	[redacted] (Signature/Date)

PURPOSE AND SCOPE

On September 24, 2020, the Office of Quality Assurance, Internal Compliance & Oversight (QICO) issued the Grout Pad Renewal Internal Review report. This internal Corrective and Preventive Action (iCAPA) is developed to address associated finding(s) and required action(s) for **QICO-SGPR-21-03**.

FINDING(S)

FQ-SGPR-21-03: Verifying equipment calibration before use would validate equipment performance, safety and avoid damage to the structure integrity.

REQUIRED ACTION

QICO-SGPR-21-03	***Office of Track and Structures (TRST)***	*Risk:* Elevated	

Required Action(s):

Executing and completing quality control checklists to verify equipment calibration and material expiration dates before use.

Measure: Inspection, Measuring & Test Equipment *Risk Category:* Service Delivery *(4, 4)*

ACTION PLAN OVERVIEW

Must be completed by Action Owner:

TRST will ensure all equipment used for grout pad reconstruction are periodically calibrated and compliant by conducting and completing Quality Assurance/ Quality Control (QA/QC) checklists. In addition, TRST will submit tool inventory/list verifying completed equipment labeling.

Business Impact – Budget/Cost Estimate: Operating

Process Improvement – A current process/procedure needs to be optimized to address the Required Action(s). This type of initiative does not need additional resources because current manpower will be used to improve the process.

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Actionable Items		Description	Responsible Party[1]	Est Start[2]	Est End[3]
1.	Enforce use of Calibrated Equipment	TRST will submit completed and signed QA/QC checklist to verify all equipment used for grout pad reconstruction that require periodic calibration are compliant.	**Joseph Fowler (TRST)**	01/12/21	06/15/21
2.	Equipment labeling	TRST will submit a memo verifying that all jackhammers used in grout pad reconstruction have been labeled and provide a sample photo of labeled equipment.	**Joseph Fowler (TRST)**	10/06/20	01/13/21
3.	QICO CAP Verification Report	QICO will evaluate actionable items submitted to confirm there is reasonable evidence that the findings and this required action have been resolved, taking into account the actionable item descriptions and performance measures.	**QICO**	06/15/21	07/20/21

PERFORMANCE MEASURES

TRST to provide Six (6) months of completed and signed Quality Assurance/ Quality Control (QA/QC) checklists of equipment calibration per Actionable Item #1

[1] In the event of personnel or departmental changes, responsibilities for actionable items shall transfer to the new leadership.

[2] Est Start – Estimated Start Date.

[3] Est End – Estimated Completion Date.

[4] Offices designated as supporting roles provide subject matter expertise to responsible parties during action development and are not directly responsible for delivery of actionable items listed above.

RESPONSIBLE PARTIES

TRST	Joseph Fowler	[redacted]
		(Signature/Date)

SECOND-LEVEL RESPONSIBILITY

RIME	Michael Hass	[redacted]
		(Signature/Date)

PURPOSE AND SCOPE

On September 24, 2020, the Office of Quality Assurance, Internal Compliance & Oversight (QICO) issued the Grout Pad Renewal Internal Review report. This internal Corrective and Preventive Action (iCAPA) is developed to address associated finding(s) and required action(s) for **QICO-SGPR-21-04**.

FINDING(S)

FQ-SGPR-21-04: Following approved work instructions and complying with design specifications would promote quality, avoid rework and reduce waste.

REQUIRED ACTION

QICO-SGPR-21-04	***Office of Track and Structures (TRST)***	*Risk:* Elevated	

Required Action(s):

Enforce adherence to approved work instructions and proper execution of work standards.

Measure: Process Control *Risk Category:* Service Delivery *(4, 4)*

ACTION PLAN OVERVIEW

Must be completed by Action Owner:

TRST will perform Quality Assurance/ Quality Control (QA/QC) to ensure compliance with work instructions and provide QICO with completed and signed checklist. In addition, TRST will communicate with surveying personnel and provide QICO with evidence of completed survey process.

TRST will update grout pad quality control checklist to include expiration dates of cementitious grout material and enforce performance and completion of Quality Assurance/ Quality Control (QA/QC).

Business Impact – Budget/Cost Estimate: Operating

Process Improvement – A current process/procedure needs to be optimized to address the Required Action(s). This type of initiative does not need additional resources because current manpower will be used to improve the process.

Actionable Items		Description	Responsible Party[1]	Est Start[2]	Est End[3]
1.	Perform Quality Assurance/ Quality Control (QA/QC)	TRST will submit completed and signed QA/QC checklist performed by supervisors.	**Joseph Fowler (TRST)**	01/12/21	06/15/21
2.	Communication request for deck survey	TRST will submit proof of communication (Example email, memorandum, etc.) requesting survey personnel to perform the scanning and marking of the location of deck rebar grids before demolition of the existing grout pad and stud installation in order not to damage the invert structure. Markings will be documented with photographs.	**Joseph Fowler (TRST)**	01/12/21	06/15/21
3.	Quality Assurance/ Quality Control (QA/QC) expired materials	MOWE will submit a revised Grout Pad Production Quality Control Checklist that includes expiration dates of cementitious grout material.	**Ravi Amin (MOWE)**	01/12/21	06/15/21
4.	QICO CAP Verification Report	QICO will evaluate actionable items submitted to confirm there is reasonable evidence that the findings and this required action have been resolved, taking into account the actionable item descriptions and performance measures.	**QICO**	06/15/21	07/20/21

PERFORMANCE MEASURES

Provide six (6) months of completed Quality Assurance/ Quality Control (QA/QC) checklists as per Actionable Item #1.

Provide six (6) months of communication of completed survey request with photos of marked deck surfaces as per Actionable Item #2.

[1] In the event of personnel or departmental changes, responsibilities for actionable items shall transfer to the new leadership.

[2] Est Start – Estimated Start Date.

[3] Est End – Estimated Completion Date.

[4] Offices designated as supporting roles provide subject matter expertise to responsible parties during action development and are not directly responsible for delivery of actionable items listed above.

RESPONSIBLE PARTIES

TRST	Joseph Fowler	[redacted] (Signature/Date)
MOWE	Ravi Amin	[redacted] (Signature/Date)

SECOND-LEVEL RESPONSIBILITY

RIME	Michael Hass	[redacted] (Signature/Date)

SWITCH MACHINE POWER SUPPLY REPLACEMENT (SMPS) iCAPA

Return to Summary of Required Actions

INTERNAL REVIEW

CAPITAL PROGRAM – MANAGEMENT & EXECUTION

In response to the internal review report regarding Switch Machine Power Supply replacement project, the Office of Signaling Systems Renewal Program (SSRP) and the Office of Quality Assurance Internal Compliance & Oversight (QICO) have coordinated the development of one (1) iCAPA. The iCAPA has been developed to address required actions and the associated findings.

EXECUTIVE LEADERSHIP COMMITMENT

Internal Corrective and Preventive Action (iCAPA) Commitment

[redacted]

Laura Mason *Date*
Executive Vice President, Capital Delivery

WMATA INTERNAL OVERSIGHT

Internal Corrective and Preventive Action (iCAPA) Commitment

[redacted]

Hakim Davis *Date*
Vice President, Quality Assurance, Internal Compliance & Oversight (QICO)

[redacted]

Eric Christensen *Date*
Executive Vice President, Internal Compliance (INCP)

[redacted] 1/12/21

Paul J. Wiedefeld *Date*
General Manager & Chief Executive Officer (GM/CEO)

PURPOSE AND SCOPE

On December 16, 2020, the Office of Quality Assurance, Internal Compliance & Oversight (QICO) issued the Office of Signaling Systems Renewal Program (SSRP) Internal Review (IR) report. This internal Corrective and Preventive Action (iCAPA) is developed to address associated findings and required action for **QICO-SSRP-21-01.**

FINDINGS

FQ-SSRP-21-01: Establishing governing documentation would provide a standard for work processes, promote efficiency and assist in maintaining compliance throughout the life of the project.

FQ-SSRP-21-02: Maintaining a training and certification matrix for employees and contractors promotes proper skills management and safety compliance.

FQ-SSRP-21-03: Tracking the contractor's drug and alcohol program would assist in monitoring compliance to contract requirements.

FQ-SSRP-21-04: Conducting safety and quality oversight on contractor performance serves as a verification tool for the fulfillment of performance requirements.

FQ-SSRP-21-05**:** Establishing a change management process promotes effective document control and improves project and departmental efficiency.

REQUIRED ACTION

QICO-SSRP-21-01	Office of Signaling Systems Renewal Program (SSRP)	*Risk:* Elevated	

Create a Project Specific Quality Management Plan, inclusive of governing processes that would facilitate the oversight of safety compliance and quality of work.

Measure: Safe Work Standards *Risk Category:* Safety *2,3*

ACTION PLAN OVERVIEW

SSRP will develop and provide a Project Specific Quality Management Plan that details policies, procedures, roles and responsibilities in achieving quality objectives.

Business Impact – Budget/Cost Estimate: Capital

Process Improvement – A current process/procedure needs to be optimized to address the Required Action(s). This type of initiative does not need additional resources because current manpower will be used to improve the process.

Actionable Items		Description	Responsible Party[1]	Est Start[2]	Est End[3]
1.	Project Specific Quality Management Plan	SSRP will submit a Quality Management Plan that outlines contractor quality oversight. The QMP will be inclusive of SOPs, roles and responsibilities, nonconformance identification, mitigation and closure,	**Tiffani Jenkins (SSRP)**	01/11/21	03/31/21
2.	Training Matrix and Records	SSRP will develop and submit a training matrix and training records of required training for all active SSRP personnel.	**Tiffani Jenkins (SSRP)**	01/11/21	03/31/21
3.	Verification of Contractor's Drug and Alcohol Testing	SSRP will develop and submit controls/compliance checklist to ensure contractor scheduled submittals are in compliance with contract requirements	**Tiffani Jenkins (SSRP)**	01/11/21	03/31/21
4.	Safety and Quality Oversight	SSRP will conduct and provide contractor equipment calibration verification and verify contractor Job Safety Briefing on both Roadway and non-Roadway.	**Tiffani Jenkins (SSRP)**	01/11/21	03/31/21
5.	Change Management SOP	SSRP will submit a change management SOP that defines roles and activities to manage and control changes during the project life cycle	**Tiffani Jenkins (SSRP)**	01/11/21	04/30/21
6.	QICO CAP Verification Report	QICO will evaluate actionable items submitted to confirm there is reasonable evidence that the findings and this required action have been resolved, taking into account the actionable item descriptions and performance measures.	**QICO**	05/03/21	05/30/21

PERFORMANCE MEASURES

Provide three (3) months records of contractor equipment calibration verification and Job Safety Briefings for action item #4

[1] In the event of personnel or departmental changes, responsibilities for actionable items shall transfer to the new leadership.

[2] Est Start – Estimated Start Date.

[3] Est End – Estimated Completion Date.

[4] Offices designated as supporting roles provide subject matter expertise to responsible parties during action development and are not directly responsible for delivery of actionable items listed above.

RESPONSIBLE PARTIES

SSRP	Tiffani Jenkins	[redacted]
		(Signature/Date)

SECOND-LEVEL RESPONSIBILITY

CAPD	Laura Mason	[redacted]
		(Signature/Date)

OPERATIONS MANAGEMENT SERVICES (OPMS) iCAPA

Return to Summary of Required Actions

INTERNAL REVIEW

Internal Safety Review

In response to the Internal Safety Review report regarding the Office of Operations Management Services (OPMS), the Office of Quality Assurance Internal Compliance & Oversight (QICO) has coordinated the development of one (1) iCAPA. This iCAPA has been developed to address the associated findings and required action.

EXECUTIVE LEADERSHIP OF RESPONSIBLE PARTIES

Internal Corrective and Preventive Action (iCAPA) Commitment

[redacted]

Joseph Leader *Date*
Executive Vice President & Chief Operating Officer

EXECUTIVE LEADERSHIP OF RESPONSIBLE PARTIES

Internal Corrective and Preventive Action (iCAPA) Commitment

[redacted]

Hakim Davis *Date*
Vice President, Quality Assurance, Internal Compliance & Oversight (QICO)

[redacted]

Eric Christensen *Date*
Executive Vice President, Internal Compliance (INCP)

[redacted] 11/19/20

Paul J. Wiedefeld *Date*
General Manager & Chief Executive Officer (GM/CEO)

PURPOSE AND SCOPE

On November 5, 2020, the Office of Quality Assurance, Internal Compliance & Oversight (QICO) issued the Office of Operations Management Services (OPMS) Internal Safety Review (ISR) report. This internal Corrective and Preventive Action (iCAPA) is developed to address associated findings and required action for **QICO-OPMS-21-01**.

FINDINGS

FS-OPMS-21-01: Creating and instituting documentation of all System Safety Program Plan (SSPP) required plans and documents promotes a strong safety culture.

FS-OPMS-21-02: Using designated share drive to store and access the latest controlled document reduces the risk of disseminating obsolete information.

FS-OPMS-21-03: Revising the Roadway Worker Protection (RWP) training course to include the Hazardous Concern Form as referenced in the RWP SOP (January 2020) promotes a culture of safety in the classroom and on the job.

FS-OPMS-21-04: Updating WAVS SOP to include both controlled documentation of completed random checks and appropriate controls for remote access to confidential information reduces risks to WMATA and WMATA personnel.

REQUIRED ACTION

QICO-OPMS-21-01	***Office of Operations Management Services (OPMS)***	*Risk:* Low	

Develop, revise and implement documentation to advocate compliance with the SSPP and departmental SOPs.

Measure: Safe Work Standards *Risk Category:* Safety *2,3*

ACTION PLAN OVERVIEW

OPMS will provide the updated employee emergency contact list and training matrix with revision control / date, in accordance with the SSPP to promote a strong safety culture.

To ensure clear articulation of process, the following three OPMS SOPs will be updated to resolve findings:
OPMS SOP: Explanation of added control for the dissemination of source training material.
RWP SOP: OPMS has not been utilizing Hazardous Form so the form along with its references will be removed. Updated current notification methods will be included in SOP.
WAVS SOP: Explanation of substituting physical access with electronic-only access to reinforce security of Person Identifiable Information (PII), eliminating the need for random physical checks.

Business Impact – Budget/Cost Estimate: Operating
Process Improvement – A current process/procedure needs to be optimized to address the Required Action(s). This type of initiative does not need additional resources because current manpower will be used to improve the process.

Actionable Items		Description	Responsible Party[1]	Est Start[2]	Est End[3]
1.	Emergency Contact List	OPMS will submit their updated Emergency Contact list.	**Linda Stoffregen (OPMS)**	11/16/20	11/30/20
2.	Training Matrix	OPMS will update and submit the Training Matrix with revision control / date.	**Linda Stoffregen (OPMS)**	11/16/20	11/30/20
3.	Training Material	OPMS will provide and submit an updated OPMS SOP adding controls to the curriculum change log for removable media with training material in source format.	**Linda Stoffregen (OPMS)**	11/16/20	01/31/21
4.	RWP SOP	OPMS will submit an updated RWP SOP to remove the Hazardous Concern form	**Linda Stoffregen (OPMS)**	11/16/20	01/31/21
5.	WAVS SOP	OPMS will submit an updated WAVS SOP that highlights the electronic only access to the system and remove the random work place checks	**Linda Stoffregen (OPMS)**	11/16/20	01/31/21
6.	QICO CAP Verification Report	QICO will evaluate actionable items submitted to confirm there is reasonable evidence that the findings and this required action have been resolved, taking into account the actionable item descriptions and performance measures.	**QICO**	02/01/21	02/28/21

PERFORMANCE MEASURES

[1] In the event of personnel or departmental changes, responsibilities for actionable items shall transfer to the new leadership.

[2] Est Start – Estimated Start Date.

[3] Est End – Estimated Completion Date.

[4] Offices designated as supporting roles provide subject matter expertise to responsible parties during action development and are not directly responsible for delivery of actionable items listed above.

RESPONSIBLE PARTIES

OPMS	Linda Stoffregen	[redacted]
		(Signature/Date)

SECOND-LEVEL RESPONSIBILITY

OBPP	Andrea Burnside	[redacted]
		(Signature/Date)

SUPPLEMENTAL MATERIALS

APPENDIX A: THE 15 CORE QMS STANDARDS PER THE QUALITY MANAGEMENT SYSTEM PLAN

1. ***Management Responsibilities:*** *Commitment of senior management to implement, maintain, and continually improve upon WMATA's Quality Management System*
2. ***Document Quality Management System:*** *The combined set of quality documents, including a Quality Management System Plan, subordinate Quality Management Plans, Policies & Procedures, Work Instructions, Forms, etc.*
3. ***Design Control:*** *Processes to ensure the consistent development and maintenance of quality design documentation for projects and assets based on requirements, standards, criteria, etc.*
4. ***Document Control:*** *Managing information to ensure the most current approved documents are used*
5. ***Purchasing:*** *Providing for timely procurement of the right items/assets and services required for proper performance*
6. ***Identification & Traceability of Assets & Materials:*** *The ability to track the unique history, location performance, and configuration of any asset over its lifecycle*
7. ***Process Control:*** *Management and documentation of inter-related resources and activities to turn inputs into outputs/outcomes*
8. ***Inspection, Testing & Status:*** *Verification and documentation that practices, processes, assets, and materials comply with applicable procedures, specification, etc. and are fit for service*
9. ***Inspection, Measuring & Test Equipment:*** *Identification and periodic testing and calibration of measuring and test equipment to assure readiness for use*
10. ***Non-Conformance:*** *Systematic tracking of work performed or material that does not meet procedures, specs, contract requirements, etc.*
11. ***Corrective & Preventive Actions:*** *Measured taken to modify processes/procedures to correct and prevent recurrence of non-conformances and failures*
12. ***Quality Records:*** *Documents generated by Quality functions that provide objective evidence of fulfilment of requirements*
13. ***Internal Reviews & Quality Assessments:*** *Independent, objective review of conformance to quality standards and/or the overall effectiveness of processes in delivering acceptable levels of quality*
14. ***Training:*** *Providing skills and knowledge required for staff to successfully perform a job*
15. ***Customer Focus:*** *Proactively addressing the needs and wants of internal and external customers, always*

APPENDIX B: SYSTEM SAFETY MEASURES

Policies, Procedures & Standards (SSPP Elements 1-5, 12, 13, 15 & 17)

- ***Safe Work Standards:*** *The existence and effectiveness of department policies, procedures, manuals, work instructions, safety and security practices, and other safety and security requirements that define department safe work practices.*
- ***Work Measurement:*** *The existence and effectiveness of operational safety goals and sound management routines to achieve these goals.*
- ***Configuration Management:*** *The existence and effectiveness of processes, tools, and techniques to manage changes to a system to achieve intended outcomes.*
- ***Safety Management:*** *The existence and effectiveness of supervision strategy to ensure personnel are adequately equipped to perform work safely and qualified to perform work to standard.*

Training, Certification & Compliance (SSPP Elements 16, 18, 20 & 21)

- ***Application & Fulfillment:*** *Adherence to existing/adopted policies, procedures, and standards; including applicable engineering or other technical requirements that specify material and/or workmanship standards.*
- ***Job Safety:*** *Adherence to safety requirements, including enterprise-wide standards (e.g. MSRPH) or those specific to a particular type of work (e.g. PPE).*
- ***Safety Training & Certification:*** *The existence and effectiveness of a training strategy to ensure personnel are adequately qualified to perform work.*
- ***Regulations & Oversight:*** *Adherence to requirements, guidelines, and recommendations from external/regulatory authorities and internal oversight functions, including items issued for corrective and preventive actions.*

Hazard Management (SSPP Elements 6, 10, 11 & 19)

- ***Data Assurance:*** *Assessing the existence of a hazardous condition that has been identified.*
- ***Assets and Activities:*** *The performance of gathering all data, conducting interviews & field inspections to determine the risk level and prioritize hazardous conditions and focus available resources on the most serious hazards requiring resolution.*
- ***Document Control:*** *Assessing the effectiveness of hazard tracking and documentation of all systems to mitigate and prevent reoccurrence.*

Safety (SSPP Elements 7, 8, 9 & 14)

- ***Managing Safety in System Modification:*** *Evaluating and assuring that a proposed modification does not adversely affect the system, vehicle, equipment or facility previously certified under the System Safety & Security process.*
- ***Emergency Management:*** *Assessing the management of operational emergencies and preparedness to maintain and continue safe operation under such conditions.*
- ***Occupational Safety & Health:*** *Validating the development of Safety programs and the administration of training to required personnel to assure safe and healthful working conditions for employees and contractors.*

APPENDIX C: RISK ASSESSMENT

Risk Assessment Methodology

Risk is defined as an uncertain event or condition that, if it occurs, has a positive or negative effect on the organization's objectives and operations (both threats and opportunities). It is assessed on the combination of the probability of occurrence of risk and the severity of the risk. Risk management is an attempt to answer the following questions:

- What can go wrong? – The Risk
- How bad are the consequences? – The Impact
- How often does/will it happen? – The Probability of Occurrence
- Is the risk acceptable? – The Risk Treatment, Remediation

Categories of Risk

- *Service Delivery* – A broad range of risks with direct or indirect impact on daily transit and/or business operations. The risk of direct or indirect losses or other negative effects due to inadequate or failed internal business or transit operations, or from external events that impair internal processes, people, or systems.
- *Financial* – The risk to achievement of the Authority's mission arising from an inability to manage credit, debt and financial leverage, and other financial resources. Financial risk would also include risk arising from adverse movements in market rates or the Authority's inability to meet its obligations.
- *Legal & Compliance* – Risks arising from a failure to comply with applicable laws and regulations and a failure to detect and report activities that are not compliant with statutory, regulatory, or internal policy requirements. Failure to comply with prescribed guidelines and established practices. This would also include a lack of awareness or ignorance of the relevant standards, guidelines or regulations.
- *Safety* - The risk of achievement of the Authority's mission arising from failures to prevent hazards that may cause harm to human, equipment, or the environment. This would also include risk arising from the Authority's inability to comply with safety-related legal or regulatory standards.
- *Strategic* – Risks arising from failure to achieve strategic or tactical objectives, an adverse business decision, or a lack of strategic direction and leadership. This would also include the ineffective implementation of the strategic plans, a lack of business strategies developed to achieve goals, and inadequate resources deployed against the achievement of those goals. Strategic risks can be affected by changes in the political environment such as changes in administration and resulting changes in strategic priorities. Strategic risks can also be triggered by actions of key stakeholders such as the Tri-Jurisdictional law makers or the Federal Transit Administration (FTA).
- *Technology* – The risk of unexpected losses from inadequate systems, breaches in information technology security, and inadequate business continuity planning. This would also include risks to the achievement of the Authority's mission arising from the inability of networks, security, and technologies to meet Metro's evolving needs.
- *Reputation* – The risk to the achievement of the Authority's mission arising from negative internal or external stakeholder opinion. Reputation risk affects the Authority's ability to establish new and/or sustain existing relationships.

Risk Assessment Process

The following risk matrix is used to assess risks within the universe of review areas. The universe (see Table 1) is comprised of the potential range of all review activities and review business units (or departments) that fall within QICO's scope and oversight authority. These business units consist of programs, processes, assets and people which together contribute to the fulfilment of the departments' strategic goals (Goal 1 - Build Safety Culture; Goal 2 - Deliver Quality Service; Goal 3 - Improve Regional Mobility; and Goal 4 - Ensure Fiscal Stability).

Risks are assessed based on the significance of their impact (see horizontal axis in Figure 1) and the probability of occurrence (see vertical axis in Figure 1). The probability ratings are rated on a scale of 1 (minimum) to 5 (maximum) and are driven by the metrics shown on the next page. The impacts ratings are also rated on a scale of 1 (minimum) to 5 (maximum) and are driven by the category of risks, which are then aligned on the metrics shown on the next page.

Each finding is given a severity rating of Insignificant, Low, Moderate, Elevated or High. All areas with Elevated/High ratings are considered to be high risk to the organization's objectives; and need to be mitigated/reduced in severity at the earliest. The risk ratings to the findings are provided as "Type of Risk" followed by "Severity Rating (Impact, Probability)" (e.g. a finding with *"Elevated (4,3)"* would mean a 'significant (4)' impact along with a 'possible (3)' probability of occurrence).

APPENDIX C: RISK ASSESSMENT

Risk Assessment Matrix

Probability of Occurrence	Impact: Negligible (1)	Minor (2)	Moderate (3)	Significant (4)	Major (5)
Almost Certain (5)	Low	Moderate	Elevated	High	High
Likely (4)	Low	Low	Moderate	Elevated	High
Possible (3)	Low	Low	Moderate	Elevated	Elevated
Unlikely (2)	Insignificant	Low	Low	Moderate	Moderate
Rare (1)	Insignificant	Insignificant	Low	Moderate	Moderate

Probability — Potential Impact of Risk

Risk Scale Definitions

Insignificant	Reasonable assumption that this risk will not occur and unlikely to cause the activity to fail to meet part of its objective.
Low	Reasonable assumption that this risk will likely not occur & may cause a failure of the business process to meet part of its objectives.
Moderate	Reasonable assumption that this risk may occur & may cause a failure of the business process to meet a significant part of its objectives.
Elevated	Reasonable assumption that this risk will likely occur & likely to cause a failure of the business process to meet a significant part of its objectives.
High	Reasonable assumption that this will occur & will cause a failure of the business process to meet its objectives or cause objective failure in other activities.

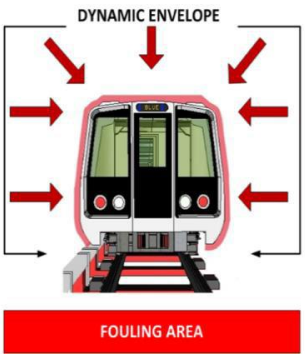
Potential Impact

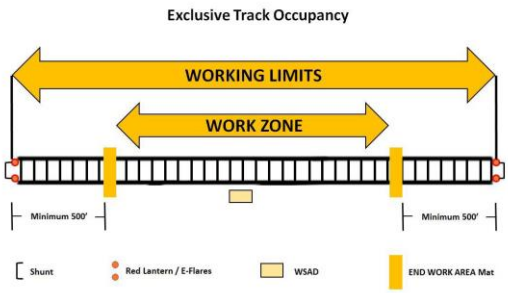
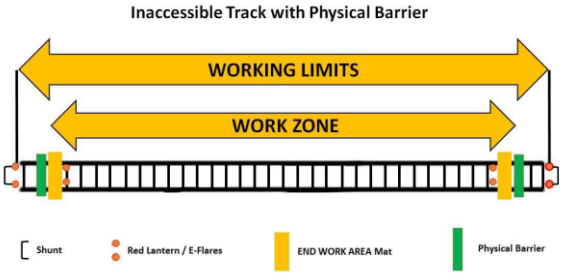
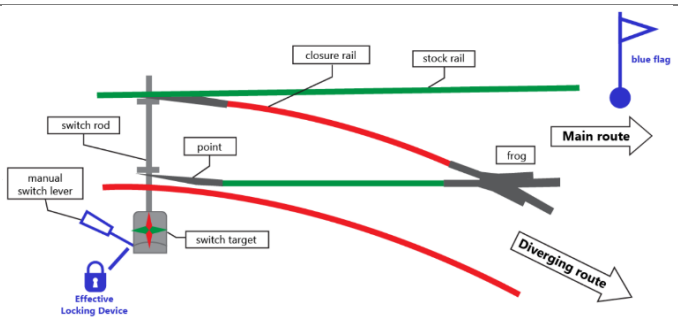
(1) Negligible – Unlikely to cause the activity to fail to meet part of its objectives.
(2) Minor – May cause a failure of the business process to meet part of its objectives, which may expose Metro to minor financial losses, less- effective or efficient operations, some non- compliance with laws and regulations, waste of resources, etc.
(3) Moderate – May cause a failure of the business process to meet a significant part of its objectives, or negatively impact the objectives of other activities, which may expose Metro to moderate financial losses, reductions to or ineffectiveness of operations, non- compliance with laws and regulations, sizable waste of resources, etc.
(4) Significant – Likely to cause a failure of the business process to meet a significant part of its objectives, or negatively impact the objectives of other activities, which may expose Metro to significant financial losses, reductions to or ineffectiveness of operations, non- compliance with laws and regulations, sizable waste of resources, etc.
(5) Major – Will cause a failure of the business process to meet its objectives, or cause objective failure in other activities, which may cause or expose Metro to major financial losses, interruptions in operations, failure to comply with laws and regulations, major waste of resources, failure to achieve stated goals, etc.

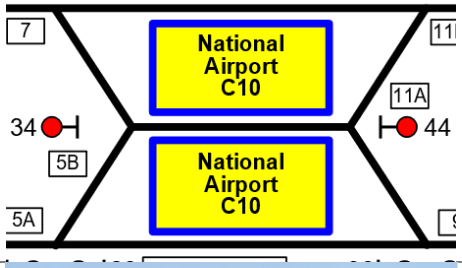
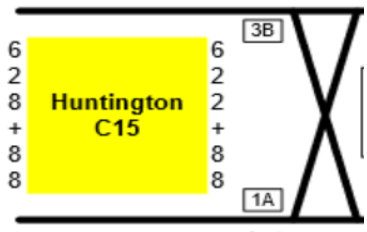
Probability of Occurrence

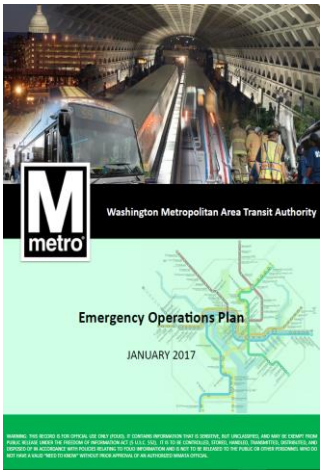
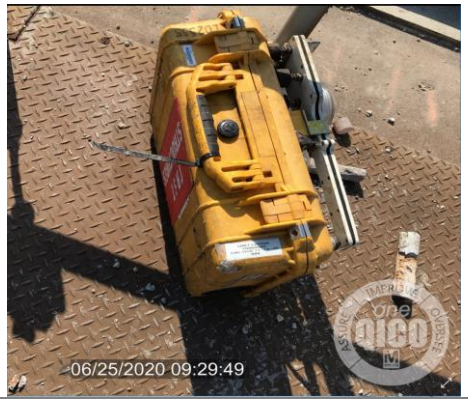
(1) Rare – Reasonable assumption that this risk will not occur
(2) Unlikely – Reasonable assumption that this risk will likely not occur
(3) Possible – Reasonable assumption that this risk may occur
(4) Likely – Reasonable assumption that this risk will likely occur
(5) Almost Certain – Reasonable assumption that this will occur

APPENDIX D: TECHNICAL TERMINOLOGY

DESCRIPTION	
- **Advance Mobile Flagger (AMF):** An AMF is a flagging person who is positioned at a station to notify incoming Class I and Class II vehicles that personnel are present on the roadway ahead. This type of protection is generally used for the purpose of track inspection.	
- **Blue Flag Protection:** Blue flag protection provides safety to workers from the inadvertent movement of equipment on which they are working using trade specific locks, blue flags and worker identifying tags to show others that there are personnel working on a piece of rail equipment.	 
- **Class 1 Vehicle:** At WMATA, a Class 1 vehicle is the term used to define all passenger rail cars operating on the system. They are powered by the third rail and governed by the speed commands across the system.	
- **Class 2 Vehicle:** At WMATA, a Class 2 vehicle is the term used to define all other pieces of equipment used on the system. They are self-propelled and not governed by speed commands across the system.	
- **Dynamic Envelope:** The Dynamic Envelope is the clearance required for a rail vehicle to negotiate the system without coming into undesired contact with the infrastructure.	

DESCRIPTION	
- **Exclusive Track Occupancy (ETO):** Personnel use shunts to show the track as occupied and prevent a Class I vehicle from entering the area where work is being performed. This type of protection is generally used for shorter term work.	
- **Geismar Torque Machine:** The machine is designed to properly torque the fastener nuts to the anchor studs. These torque settings can be preset to ensure uniform tightening.	
- **Ground Penetrating Radar (GPR):** is a geophysical method that uses radar pulses to image the subsurface. This nondestructive method uses electromagnetic radiation in the microwave band (UHF/VHF frequencies) of the radio spectrum, and detects the reflected signals from subsurface structures	
- **Inaccessible Track (IT):** This method of protection uses a derail, locked switch or other barrier to prevent rail vehicle movement into the area where work is being performed. This type of protection is generally used for longer term work.	
- **Lined and Locked**: Describes a process of aligning a railroad switch for the desired direction of movement across that switch, then locking the railroad switch in that position. In the image to the right, train movement will follow the red rails.	

DESCRIPTION	
- **Operator Console:** The portion of a rail vehicle where the vehicle is operated from. The Operator Console will have all controls in which to move the vehicle and operate all functions.	
- **Pocket Track:** In the WMATA rail system, a pocket track is generally a section of track separate from the main lines of track used for short- or long-term equipment storage. In this scenario, it is a third track at a station platform that is situated between the two main line tracks.	
- **Rail Bound Equipment**: Term used to describe a piece of equipment that is operating on the rails of a track system.	
- **Switch Machine Power Supply:** Trackside equipment which functions as the control for the track switch. Track switches direct rail traffic to the desired tracks.	
- **Switch Machine:** Equipment located in the Train Control Room (TCR) that supplies power to a rail switch. A rail switch receives two power supplies, a normal supply and a reserve supply.	
- **Terminal Station:** At WMATA, the final passenger station in a line. At a terminal station trains enter and leave from the same end of the platform.	

DESCRIPTION	
- **WMATA COOP Annex Plan:** WMATA COOP Plan: Continuity of Operations Plan, The Authority's (aka, WMATA) method and plan for continuing essential services and uphold its primary responsibilities to the best of its ability given irregular circumstances, many times, as a result of an incident or emergency, however construction projects and special events may require implementation of a continuity of operations plan.	
- **Warning Strobe Alarm Device/WSAD:** Safety device used to monitor de-energized third rail where track work is underway and provides an audible (siren) and visual (flashing strobe light) warning if the rail becomes energized.	

Additional Terms
- **Calibration:** The process of adjusting equipment to be within the appropriate tolerance to precisely perform the equipment's function. Generally applied to measuring and testing equipment.
- **Certification:** Period task performed by technicians who tests equipment to ensure functions are within calibration. Upon completion of testing all passing equipment received a new sticker denoting when the next certification must occur
- **ELM:** Enterprise Learning Management (ELM) is the learning Management System used by Metro Employees, Managers, Instructors and Administrators to manage learning throughout the entire Metro organization. ELM integrates with [redacted] to import personal and organization data.
- **Epoxy:** Adhesive material used to bond anchor stud with surrounding concrete.
- **Foul Time (FT):** A method of RWP in which a qualified Level 2 or Level 4 Roadway Worker requests that the Rail Operations Control Center (ROCC) stop all rail vehicle movement in a specific area for a limited amount of time, typically by changing track lunars from white (proceed) to red (stop) to prevent train operators from entering the FT area. This type of protection is generally used for track inspection or very short-term work.
- [redacted] A web-based application used to create access requests to perform work on the roadway. This includes yards and yard leads. [redacted] allows multiple departments to plan access to the same portion of the roadway without interference between the departments.
- **Locomotive Servicing:** A designated facility for maintenance of locomotives
- **Mode 3:** At WMATA, a means of operating a Class I vehicle that bypasses the speed commands from the ATP system. Mode 3 operation shall be treated by all employees as a serious and potentially hazardous condition which must only be used as a last resort when absolutely necessary to move a Class I vehicle.
- **Torque:** The application of preload to a fastener by the turning of the fastener's nut.