



INTERNAL REVIEW

Metro's Tunnel Ventilation System: Mechanical Subsystem Maintenance

In response to the internal review report for Metrorail Tunnel Ventilation System: Mechanical Subsystem Maintenance dated April 10, 2017 QICO has coordinated with Operations and Engineering departments to develop five (5) comprehensive CAPs. Each CAP outlines the findings, requirements and recommendations addressed, and a detailed action plan outlining responsible parties and specific actionable items.

EXECUTIVE LEADERSHIP OF RESPONSIBLE PARTIES

Corrective Action Plan (CAP) Commitment



Joseph Leader
Chief Operating Officer (COO)

6/7/17

Date

WMATA INTERNAL OVERSIGHT

Corrective Action Plan (CAP) Acknowledgement



Angel Peña
Managing Director, Quality Assurance, Internal Compliance & Oversight (QICO)

06/07/17

Date



Eric Christensen
Chief, Internal Compliance (INCP)

6/8/17

Date



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

6/9/17

Date



CORRECTIVE ACTION PLAN

Purpose and Scope

On April 10, 2017 QICO issued an internal review report for Metrorail Tunnel Ventilation System: Mechanical Subsystem Maintenance. This Corrective Action Plan (CAP) has been developed to address the following findings and required action per QICO-TVS-17-01.

QICO Finding

QICO Recommendation

F-TVS-17-01: There is an ineffective use of policies and processes already in place to correct design and configuration issues with tunnel ventilation system components.

- Ensure PLNT personnel understand the policies and processes currently in place to correct design and configuration issues making sure to involve ENGA when making any modifications to the Tunnel Ventilation System.

F-TVS-17-02: Equipment and debris was observed adjacent to PLNT work areas, impeding access to complete critical ventilation maintenance.

- Establish clear policy and protocols for the storage and removal of equipment in work areas, to include methods for communication in the event stored materials prevent completion of critical maintenance activities.

Required Action

QICO-TVS-17-01: Establish clear policies for the storage and removal of equipment in work areas, incorporating processes for interdepartmental coordination required to complete maintenance activities.

(Risk Rating: Moderate)

Plan Description

F-TVS-17-01: Formal requirements for communicating with ENGA are identified in P/I 4.10/4, "Configuration Control Management" and P/I 4.14.3, "Design Control Board". In addition, PLNT participates in the ENGA-designed Problem Statement process and is a sitting member of the Configuration Control Board.

F-TVS-17-02: For the past several years, PLNT has scheduled a quarterly housekeeping campaign during which employees remove debris/equipment from rail stations, including tunnel areas. In addition, on a routine basis when these obstacles are observed, PLNT employees remove them or contact the responsible office to remove them. PLNT will develop a draft housekeeping bulletin based on MSRPH- section 4 paragraph F for the COO's signature. In addition the new PLNT 3000 will have a section to address housekeeping which focuses on areas of rescue, egress, and general access rooms and addresses methods for communication between departments.

Business Impact – Budget/Cost Estimate

- **Process Improvement** – A current process/procedure needs to be optimized to address the QICO Required Action. This type of initiative does not need additional resources because current manpower will be used to improve the process. No impact to budget.



PLAN SCHEDULE

Actionable items		Description	Responsible Party*	Estimated Start	Estimated Completion
1	P/I Updates	P/I 4.10/4, "Configuration Control Management" and P/I 4.14/3, "Design Control Board. Policy governing creation of Problem Statements from PLNT to ENGA	Hiten Patel (ENGA)	05/18/17	08/21/17
2	PLNT Supervisor P/I Acknowledgement	Memorandum notice that P/I 4.10/4 and P/I 4.14/3 are the governing policy for communication between PLNT and ENGA regarding configuration issues.	Paul Kram (PLNT)	05/18/17	08/21/17
3	PLNT 3000	The PLNT 3000 shall be modified to include housekeeping procedures to ensure tunnel fan and vent shafts and fan areas remain clear and free of debris.	Paul Petersen (ENGA)	05/18/17	07/05/17
4	Housekeeping Bulletin	PLNT will develop a draft housekeeping bulletin based on MSRPH – section 4 paragraph F – for the COO's signature and distribution.	Paul Kram (PLNT)	05/18/17	07/13/17
5	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	08/21/17	10/06/17

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

COMPLETION DOCUMENTATION

Performance Measures

- 100% of PLNT Supervisors signature acknowledgement of revised P/I 4.10 & 4.14.
- Signature acknowledgement of Housekeeping Bulletin from AGM Rail Services and Managing Director SSRV.

RESPONSIBLE PARTIES

PLNT	Paul Kram	
ENGA	Paul Petersen	
ENGA	Hiten Patel	

SECOND LEVEL RESPONSIBILITY

MD SSRV	Randall Grooman	
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CORRECTIVE ACTION PLAN

Purpose and Scope

On April 10, 2017 QICO issued an internal review report for Metrorail Tunnel Ventilation System: Mechanical Subsystem Maintenance. This Corrective Action Plan (CAP) has been developed to address the following finding and required action per QICO-TVS-17-02.

QICO Finding

QICO Recommendation

F-TVS-17-04: Supervisors receive the same technical training as maintenance personnel. This training should be updated to emphasize the supervisory role and associated quality control responsibilities.

- Establish training requirements and programs for supervisory positions to ensure clear understanding of roles and responsibilities, specifically with regards to quality control. This should include a requirement for minimum number of quality checks for each equipment or system.

Required Action

QICO-TVS-17-02: Establish clear definitions of training requirements for maintenance and supervisory positions, including differences in roles and responsibilities and quality control measures.

(Risk Rating: Elevated)

Plan Description

F-TVS-17-04: The requirement for PLNT supervisors to perform QC inspections is identified in PLNT SOP 209-07, "Prioritization and Documentation of Maintenance Work," Section 7.5. PLNT will coordinate with OPMS to build upon that curriculum to focus on PLNT specific requirements.

Business Impact – Budget/Cost Estimate

- **Process Improvement** – A current process/procedure needs to be optimized to address the QICO Required Action. This type of initiative does not need additional resources because current manpower will be used to improve the process. No impact to budget.

PLAN SCHEDULE

Actionable items		Description	Responsible Party*	Estimated Start	Estimated Completion
1	Revised PLNT SOP 209-07	PLNT SOP 209-07 section 7.5 of this SOP requires supervisors to perform a minimum of 2 QC inspections per week on completed PMs, selected randomly from all mechanical equipment assets.	Paul Kram (PLNT)	05/15/17	06/29/17
2	Training Curriculum	OPMS has developed a 1-day quality control class for supervisors; PLNT will coordinate with OPMS to build upon that curriculum to focus on PLNT specific equipment.	Linda Stoffregen (OPMS)	05/15/17	07/14/17
3	ELM Report	ELM Report: PLNT Supervisors attend updated quality control class.	Linda Stoffregen (OPMS)	07/15/17	08/15/17
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	08/15/17	09/13/17

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



COMPLETION DOCUMENTATION

Performance Measures

- 95% of PLNT Supervisors complete quality control class.

RESPONSIBLE PARTIES

PLNT

Paul Kram

OPMS

Linda Stoffregen

SECOND LEVEL RESPONSIBILITY

MD SSRV

Randall Grooman



CORRECTIVE ACTION PLAN

Purpose and Scope

On April 10, 2017 QICO issued an internal review report for Metrorail Tunnel Ventilation System: Mechanical Subsystem Maintenance. This Corrective Action Plan (CAP) has been developed to address the following findings and required action per QICO-TVS-17-03.

QICO Finding	QICO Recommendation
F-TVS-17-05: The governing maintenance document produced by ENGA for PLNT has not been completed.	- Complete and maintain all governing maintenance instructions for PLNT (i.e. PLNT-1000, 3000, etc.), distribute to essential stakeholders when approved, and develop implementation plans for updated procedures/processes.
F-TVS-17-06: PLNT is using their preventive maintenance form when conducting an assessment of the PLNT-1000 provided by ENGA.	- Establish written requirements for conducting document assessments with regard to preventive maintenance ensuring the document under review is used first in order to spot any deficiencies more effectively.
F-TVS-17-12: Lock Out - Tag Out (LOTO) procedures are informal and inconsistently applied when removing electrical power sources for maintenance activities	- Establish written requirements for removing electrical power for maintenance activities not associated with traction power systems, to include specific instructions for LOTO of circuit breakers and electrical disconnects. These requirements must conform to OSHA requirements under section 1910.147.

Required Action

QICO-TVS-17-03: Complete, update, and maintain governing maintenance documents to ensure appropriate engineering controls of maintenance activities.

(Risk Rating: High) ■

Plan Description

F-TVS-17-05: ENGA is in the process of completing the PLNT-3000. A draft was completed Friday 04/21/17, then PLNT will be given an opportunity to add their comments and suggestions.

F-TVS-17-06: PLNT personnel will use the PLNT-1000 (and PLNT-3000 when available) checklists as their main preventive maintenance document. PLNT will continue to use Form 209-1571 as a supplemental form until the PLNT-1000 (and PLNT-3000) is updated.

F-TVS-17-12: On April 14, 2017 PLNT Director transmitted to PLNT/EQMT managers and supervisors the requirement to discuss PLNT safety bulletin 2016-01 with their crews on LOTO procedures, and to ensure with their crews were in possession of LOTO devices. PLNT will send all general equipment mechanics to SAFE's LOTO training. PLNT issued a safety bulletin with regard to the LOTO procedures. As per OSHA 1910.147 personnel are required to be retrained when they are observed not performing LOTO in accordance to the standards.

Business Impact – Budget/Cost Estimate

- **Process Improvement** – A current process/procedure needs to be optimized to address the QICO Required Action. This type of initiative does not need additional resources because current manpower will be used to improve the process. No impact to budget.



PLAN SCHEDULE

Actionable items		Description	Responsible Party*	Estimated Start	Estimated Completion
1	PLNT-3000 Final	Governing maintenance document required to complete preventive maintenance that has gone through approval process.	Paul Petersen (ENGA)	04/25/17	07/05/17
2	Revised PLNT 209-1571 Checklist	PLNT 209-1571 checklist will be used as the primary preventive maintenance document in order to provide ENGA with proper feedback for updating preventive maintenance forms. This will be done when MOC is set up for testing and both PLNT-1000 & PLNT-3000 checklists are approved.	Paul Kram (PLNT)	07/05/17	08/04/17
3	LOTO Training and Checklist	PLNT will re-train all general equipment mechanics in Lock-Out-Tag-Out (LOTO) requirements and provide a checklist for use in LOTO activities.	Paul Kram (PLNT)	05/24/17	07/24/17
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	08/05/17	10/05/17

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

COMPLETION DOCUMENTATION

Performance Measures

- 100% compliance with checklist use requirements as identified in QICO field verification activities.
- 95% of PLNT general equipment mechanics complete LOTO training.

RESPONSIBLE PARTIES

PLNT	Paul Kram	
ENGA	Paul Petersen	

SECOND LEVEL RESPONSIBILITY

MD SSRV	Randall Grooman	
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CORRECTIVE ACTION PLAN

Purpose and Scope

On April 10, 2017 QICO issued an internal review report for Metrorail Tunnel Ventilation System: Mechanical Subsystem Maintenance. This Corrective Action Plan (CAP) has been developed to address the following finding and required action per QICO-TVS-17-04.

QICO Finding

QICO Recommendation

F-TVS-17-07: Accuracy of Forms – QICO identified several instances of maintenance record modification.

- Perform an investigation into the generation of maintenance documentation, to include the items identified by QICO. This investigation must be completed by an appropriate authority not directly responsible for completing the work being investigated.

Required Action

QICO-TVS-17-04: Perform an investigation into the generation of maintenance documentation, to include the items identified by QICO. This investigation must be completed by an appropriate authority not directly responsible for completing the work being investigated.

(Risk Rating: High) ■

Plan Description

F-TVS-17-07: Quality Assurance, Internal Compliance & Oversight (QICO) will establish an experienced team to perform the investigation. Following the results of the investigation QICO and PLNT will work with Labor and Human Resource departments to address any disciplinary actions if required.

Business Impact – Budget/Cost Estimate

- **Process Execution** – A current process/procedure exists that meets the QICO Required Action, but needs to be executed. This type of initiative does not need additional resources.

PLAN SCHEDULE

Actionable items	Description	Responsible Party*	Estimated Start	Estimated Completion
1 Investigation Report	Investigation into the generation of maintenance documentation, including work order numbers: (11428620, 11395737, 11395465, and 11451733). Investigation report detailing the findings and recommendations for improvement.	QICO	05/15/17	06/27/17
2 Resulting Actions	Implementation plan detailing management actions to be taken in response to the investigation report's findings and recommendations.	Paul Kram (PLNT)	06/27/17	07/27/17
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	07/27/17	10/05/17

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

COMPLETION DOCUMENTATION

Performance Measures

- Implementation of recommendations from investigation results.



RESPONSIBLE PARTIES

PLNT

Paul Kram

Paul Kram

SECOND LEVEL RESPONSIBILITY

MD SSRV

Randall Grooman

Randall Grooman



CORRECTIVE ACTION PLAN

Purpose and Scope

On April 10, 2017 QICO issued an internal review report for Metrorail Tunnel Ventilation System: Mechanical Subsystem Maintenance. This Corrective Action Plan (CAP) has been developed to address the following findings and required action per QICO-TVS-17-05.

QICO Finding	QICO Recommendation
F-TVS-17-08: <i>Documentation Quality Concern #1:</i> Validity of Forms - Many Preventive Maintenance (PM) forms have no comments or condition assessments for consecutive months.	- Provide a means of capturing the condition of assets maintained within PM forms.
F-TVS-17-09: <i>Documentation Quality Concern #2:</i> Consistency of Forms – 1. Illegible photocopied PM forms. 2. Inconsistent nomenclature used to fill out PM forms.	- Establish clear practices for the distribution and quality control of PM forms, including requirements for digital vs. physical copies and supervisory checks of completed forms to ensure they are valid, accurate, consistent, relevant, & complete.
F-TVS-17-10: <i>Documentation Quality Concern #3:</i> Completeness of Forms – 1. PM checklists are not complete; tasks have no marks indicating a task was completed and tasks have been marked "N/A" without explanation. 2. PM checklists are missing work order numbers. 3. Annual PM checklists are missing fan amperage information.	- Standardize an amperage reading form for incorporation into PM documentation to ensure maintenance data is captured consistently, and incorporate supervisory checks of completed documentation.
F-TVS-17-11: The enterprise asset management database (MAXIMO) does not contain preventive maintenance checklists or tasks completed.	- Establish written requirements to capture and store documentation of completed maintenance, exploring the possibility of utilizing the enterprise asset management database (MAXIMO).

Required Action

QICO-TVS-17-05: Establish document control procedures to standardize the capture and storage of maintenance documentation.

(Risk Rating: Elevated)

Plan Description

F-TVS-17-08, 09 & 10: PLNT will improve the data quality of Preventive Maintenance forms to ensure forms are valid, accurate, consistent, relevant, & complete.

F-TVS-17-11: Currently mobile MAXIMO is being developed and once implemented will address many of the issues with form quality.

Business Impact – Budget/Cost Estimate

- **Process Execution** – A current process/procedure exists that meets the QICO Required Action, but needs to be executed. This type of initiative does not need additional resources.



PLAN SCHEDULE

Actionable items		Description	Responsible Party*	Estimated Start	Estimated Completion
1	SOP Revision	PLNT will modify SOP 209-07 to include data quality and provide training to personnel.	Paul Kram (PLNT)	05/23/17	06/29/17
2	Receipt of Mobile Devices	Confirmation of procurement of mobile devices for the mobile Maximo pilot program.	Paul Petersen (ENGA)	03/27/17	05/30/17
3	Curriculum and Training Roster	Provide training to PLNT personnel in the use of mobile devices, documenting attendance.	Linda Stoffregen (OPMS)	06/26/17	12/27/17
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	12/27/17	01/25/18

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

COMPLETION DOCUMENTATION

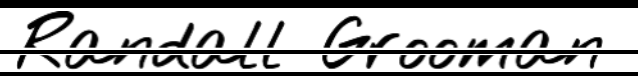
Performance Measures

- 95% of PLNT Supervisors trained in use of mobile devices.
- 95% of PLNT Supervisor and Mechanic personnel trained in updated SOP for data quality.

RESPONSIBLE PARTIES

PLNT	Paul Kram	
ENGA	Paul Petersen	
OPMS	Linda Stoffregen	

SECOND LEVEL RESPONSIBILITY

MD SSRV	Randall Grooman	
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