



Washington Metropolitan Area Transit Authority

ANNUAL INTERNAL REVIEW 2017

Metrorail Automatic Train Control Inspection and Maintenance

QICO Internal Review

June 21, 2017



Quality Assurance, Internal Compliance & Oversight (QICO)

"Quality Trumps Quantity"



QICO Internal Review

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Internal Review Summary

Why QICO Performed This Review:

- This internal review is intended to provide Metro senior management with an assessment of the state of Automatic Train Control Maintenance (ATCM) and promote the actions needed to address any concerns.
- QICO is independent from the functions it oversees, authorized by the General Manager to conduct objective reviews with unrestricted access to all functions, records, assets and employees under its purview.

QICO's Methodology:

- Developed relevant review activities by identifying and assessing risks to Quality of work, compliance with standards, records management and safety.
- Reviewed maintenance documentation, observe maintenance and inspection work while in-progress, and interview key personnel.
- Review findings and required actions are rated based on severity of risk, which ranges on a scale from "Insignificant" to "High."

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

June 2017

Automatic Train Control Maintenance (ATCM)

QICO's Review Results:

Better work order tracking and utilization of electronic records management for preventative inspections can improve accountability

QICO's internal review identified and noted several **Wins (What Worked Well)** and **Areas for Improvement** requiring corrective actions:

- ✓ Effective communication occurs on a daily basis between ATC Maintenance and ATC Production.
- ✓ ATC-1000, 2000 and 3000 maintenance manuals meet FRA standards with regards to minimum requirements and frequency of tests.
- ATC mechanics encounter delays obtaining access to the roadway for preventative maintenance inspections.
- The ATC Maintenance Control Policy does not outline technical training required for mechanics or supervisors, according to grade or experience.
- Inconsistent communication between successive shifts on Corrective Maintenance work orders in Maximo results in ineffective record keeping of work completed during each shift.
- ATCM supervisors are not performing quality control checks as required in Maintenance Control Policy.
- QICO could not identify applicable work orders when reviewing completed Preventative Maintenance (PM) data sheets.
- Several Preventative Maintenance Work Orders (WOs) in the enterprise asset management database (Maximo) do not contain the current revised version of instructions and/or sample data sheets.
- ATC corrective maintenance records, as identified in the enterprise asset management database (Maximo), indicate a backlog of open work orders dating back to 2012.
- ATC Maintenance utilizes only paper records for preventative maintenance inspection data sheets.

Required Actions:

- QICO-ATC-17-01: Establish clear training requirements for each mechanic grade including periodicity and develop methods of capturing on-the-job training in accordance with the ATC maintenance control policy for ATC. Develop a training plan to comply with updated requirements (*Risk Rating: Elevated*)
- QICO-ATC-17-02: Review and perform necessary revision to maintenance documentation, including the ATC maintenance control policy, and establish supervisory control to ensure compliance with updated requirements. (*Risk Rating: Moderate*)
- QICO-ATC-17-03: Develop a process to determine which groups receive precedence or priority for track access maximize time available to complete critical maintenance/inspection activities. (*Risk Rating: Moderate*)

1 DEPARTMENT/FUNCTION OVERVIEW

Automatic Train Control (ATC)

[Automatic Train Control \(ATC\)](#) at Metrorail is comprised of several disparate sub-systems which:

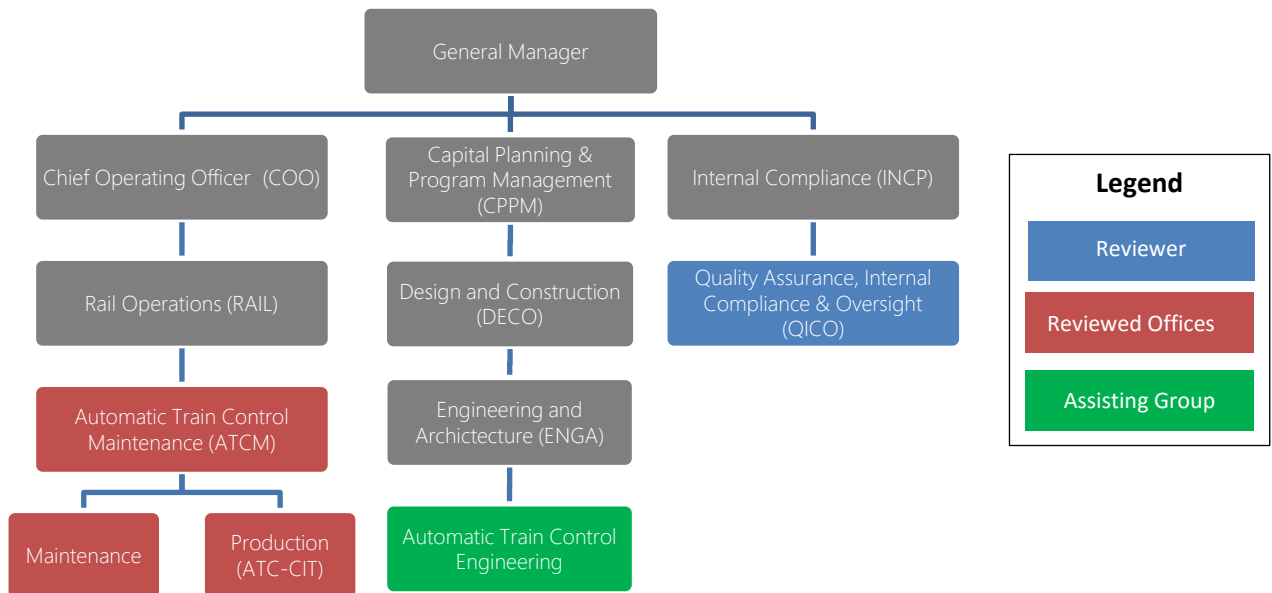
- (a) Ensure minimum safe spacing between trains through automatic maximum speed commands ([ATP](#)).
- (b) Control train routing and scheduling through communication with Rail Operations Control Center ([ATS](#)).
- (c) Provide railcars automatic deceleration and stopping profiles into passenger stations ([ATO](#)).

Ensuring the effective performance of these subsystems involves inspecting maintaining wayside ATC assets (e.g. [track circuits](#)) and assets within automatic train control rooms. Metrorail's Automatic Train Control Maintenance (ATCM) group is responsible for these functions. (More information: [Appendix B](#)).

2 REVIEW METHODOLOGY

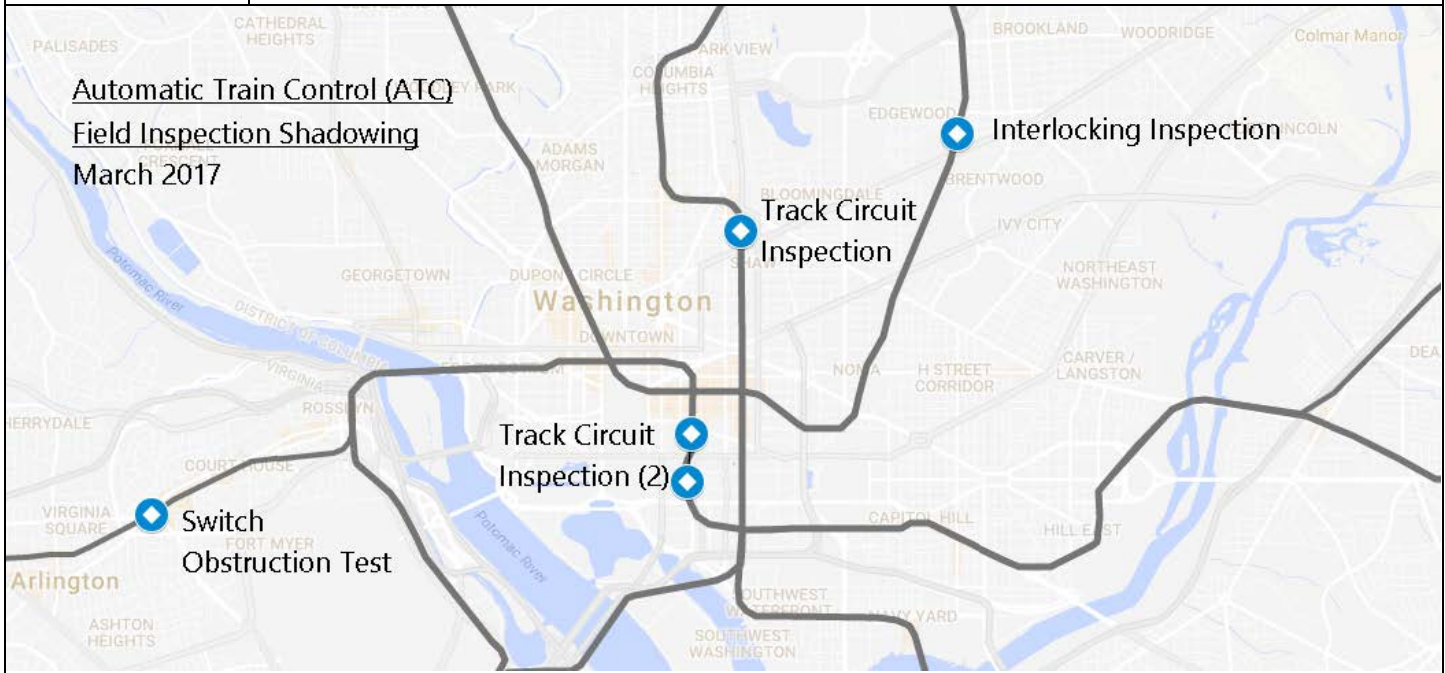
Review Stakeholders

The Infrastructure Assurance branch of the Office of Quality, Internal Compliance and Oversight (QICO) conducted a review of the Automatic Train Control Maintenance (ATCM) group, which resides within the Department of Rail Services (RAIL) under the Office of the Chief Operating Officer (COO). As shown below, QICO is independent of operations and engineering, reporting directly to the General Manager. QICO provides objective quality assurance and compliance services in order to improve the quality of assets and processes under operations and engineering departments. QICO performed the internal review from February 2 – April 28, 2017.



2.1 REVIEW SCOPE

Category	Description
Review of Existing Documentation	<ul style="list-style-type: none"> - Automatic Train Control Branch Maintenance Control Policy (Rev 3, July 2014) – policies for ATCM’s asset management (Maximo), maintenance strategies, track rights, and quality system. - ATC-1000 Instructions for Testing and Inspection of ATC Apparatus and Systems – test procedures for vital components. Used as procedures before track is returned to revenue service and for preventative maintenance tests (e.g. 1008 Switch Obstruction Test). - ATC-2000 System Integrity Maintenance Practices – rules that govern the construction, maintenance, operation, and testing of all ATC systems and apparatus (e.g. “Signal lenses must be kept clean, clear of obstructions and properly aimed”). - ATC-3000 Preventative Maintenance and Technical Procedures Manual – procedures for preventative maintenance inspections (e.g. 3003 Interlocking Inspections). - Completed preventative maintenance forms (Data Sheets)
Interviews of Key Personnel (Appendix D)	<ul style="list-style-type: none"> - Superintendents for ATCM Maintenance and Production - Area Managers - Shift Supervisors - Supervisor for Material Specialists (MATS) - ATC Engineering Management (ENGA:ATC) - Technicians during Preventative Maintenance Shadowing - Director for Technical Skills and Maintenance Training (OPMS:TSMT) <p><i>(More Information: See Reference 1 - Job Descriptions)</i></p>
Shadowing Field Inspections (Appendix E)	<ul style="list-style-type: none"> - Interlocking Inspection at (B04) Rhode Island Metro Station - Track Circuit Verification at (E02) Shaw Metro Station - Switch Obstruction at (K02) Clarendon Metro Station - Track Circuit Verification at (D01) Federal Triangle and (D02) Smithsonian Metro Station



2.2 REVIEW CRITERIA

Quality Measures		Definition
Quality of Work	Workmanship	Qualitative or quantitative measurement of material characteristics of work performed.
	Performance of Work	Qualitative or quantitative measurement of actions taken to complete work.
	Housekeeping	Assessment of site conditions; i.e. work zone organization and cleanliness.
	Quality Control Measures	Internal management controls that ensure the consistency and reliability of work performed.
	Materials and Tooling	Measurable properties of parts and tools used to perform work.
Compliance with Standards	Technical Specifications	Engineering requirements that outline the minimum requirements for material and workmanship standards.
	Business Practices	Formal documented standards governing business practices; i.e. P/I's, departmental policies, etc.
	Procedural Requirements	Formal documented standards that identify specific actions to be taken; i.e. who, what, when, where, how?
	Regulatory Findings	Findings issued by outside regulatory entities (FTA, NTSB, GAO) that generate recommendations or required actions.
	Internal Findings	Findings issued by internal oversight entities (OIG, QICO, SAFE) that generate recommendations or required actions.
Safety	Roadway Worker Protection (RWP)	Documented requirements for work zone setup and personal protective equipment.
	Applicable Job Safety Requirements	Any documented safety requirements that apply to specific work performed.
Records Management	Work Order Management	Protocols established to control maintenance scheduling, documentation, and tracking.
	Processes	Documented requirements for departmental activities.
	Records Storage and Retention	Documented requirements for the maintenance of records and documentation.

2.3 RISK ASSESSMENT

Note: Required actions are rated based on severity of risk. Refer to Figure 1 [Appendix A](#) (Risk Assessment) for details.

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

3 WHAT WORKED WELL?

Measure	Finding	Description
Quality of Work	Daily communication occurs on a daily basis between ATC Maintenance and ATC Production.	<ul style="list-style-type: none"> - ATC Production and Maintenance have daily conference calls to coordinate work. When Production installs new equipment in the Metrorail system they create a report containing details of completed work; this report is sent to the work location's Area Manager. <p><i>(Source: Emails Between ATC Management) (Reference 3)</i></p>
Compliance with Standards	ATC-1000, 2000 and 3000 manuals meet FRA standards with regards to minimum requirements for frequency of tests.	<ul style="list-style-type: none"> - The ATC 1000, 2000 and 3000 comprise the governing documentation for inspection, testing and maintenance of ATC components. - QICO's review found that the standards are within guidelines set forth by the Federal Railroad Administration (FRA). <p><i>(Source: FRA standards Section 236) (Reference 6)</i></p>

4 AREAS FOR IMPROVEMENT

Note: Findings are rated based on the associated risk to organization's objective, provided as Type of Risk followed by Risk Severity (Impact rating, Probability rating) color coding. Refer to [Appendix A](#) (Risk Assessment) for further details

Measure	Finding	Description
Quality of Work	<p>F-ATC-17-01: ATC mechanics encounter delays obtaining access to the roadway for preventative maintenance inspections.</p> <p><i>Operational Risk</i> <i>Moderate (3, 4)</i> </p>	<ul style="list-style-type: none"> - QICO observed during daily Preventative Maintenance (PM) inspections that there were substantial delays acquiring track access to perform PMs (60-min delay for Interlocking Inspection on 3-15-17, denied access for Switch Obstruction PM on 3-22-17, and a 40-min delay for Switch Obstruction on 4-4-17). This is a substantial loss of productive time. <p>Recommendation: Develop a process to determine which groups receive precedence or priority for track access, maximizing time available to complete critical maintenance/inspection activities.</p> <p><i>(Source: Preventative Maintenance Field Inspection Reports) (Appendix E)</i></p>

4 AREAS FOR IMPROVEMENT

Note: Findings are rated based on the associated risk to organization's objective, provided as Type of Risk followed by Risk Severity (Impact rating, Probability rating) color coding. Refer to [Appendix A](#) (Risk Assessment) for further details

Measure	Finding	Description
Quality of Work	<p>F-ATC-17-02: The ATCM Maintenance Control Policy does not outline technical training required for mechanics or supervisors, according to grade or experience.</p> <p>Operational Risk Elevated (4, 4) ■</p>	<ul style="list-style-type: none"> - Technical Skills and Maintenance Training (TSMT) indicated that newly-hired ATC mechanics must complete a 5-week ATC system overview course and a 2-hour switch cranking course, after which mechanics are placed in the field at "helper" level to receive on-the-job training. There is no requirement for receiving technical training prior to working in the field. - There is no requirement for additional coursework; shift supervisors determine when new mechanics complete other ATC courses provided by Technical Skills and Maintenance Training (TSMT). - The ATCM Maintenance Control Policy (MCP) outlines mandatory general and safety courses for non-represented (supervision) and represented (mechanics) personnel but no periodicity. - For technical training the MCP states there is no training available to non-represented personnel; for represented personnel it has courses but no requirements for mechanic grades or periodicity. - Although the MCP states On-the-Job training (OJT) is documented in Maximo, a search was performed with no results. During interviews, management indicated they have not documented OJT in Maximo. <p>Recommendation: Establish clear training requirements for each mechanic grade including periodicity and develop methods of capturing on-the-job training in accordance with the Maintenance Control Policy. Develop training plan to comply with updated requirements.</p> <p><i>(Source: Training Facility Tour w/ Director of Technical Skills and Maintenance Training). (Appendix E)</i></p>

4 AREAS FOR IMPROVEMENT

Note: Findings are rated based on the associated risk to organization's objective, provided as Type of Risk followed by Risk Severity (Impact rating, Probability rating) color coding. Refer to [Appendix A](#) (Risk Assessment) for further details

Measure	Finding	Description
Quality of Work	<p>F-ATC-17-03: Inconsistent communication between successive shifts on corrective maintenance work orders in the enterprise asset management database (Maximo) results in ineffective record keeping of work completed during each shift.</p> <p>Operational Risk Moderate (3, 4) </p>	<ul style="list-style-type: none"> - ATC Maintenance's primary way of viewing work completed during each shift is through Maximo. Shift supervisors can view all Preventative Maintenance (PM) and Corrective Maintenance (CM) work in-progress or completed by previous shifts from their customized start center in Maximo. - There is no requirement to write a detailed description in Maximo for corrective maintenance work that is in-progress or completed. As a result, mechanics do not always provide a detailed account of the work accomplished or any issues that may have transpired performing work. This can result in inefficient record keeping. - Successive shifts also communicate completed work through emails. When an ATC shift supervisor arrives for their shift (mid-day, evening, or night shifts), they typically email an attendance report (workforce status and work assignments) to all ATC management personnel (shift supervisors, MOC, area managers, and superintendents). At the end of their shift, they email all ATC management a shift report, which discloses all accomplished work. <p>Recommendation: Establish shift turnover standards, including requirements for documenting work completed and any issues that occur during each shift for communication to the oncoming crew.</p> <p>(Source: Shift Supervisor Daily Report Emails to ATC Superintendents, Corrective Maintenance Long Description Snapshots) (Reference 3)</p>

4 AREAS FOR IMPROVEMENT

Note: Findings are rated based on the associated risk to organization's objective, provided as Type of Risk followed by Risk Severity (Impact rating, Probability rating) color coding. Refer to [Appendix A](#) (Risk Assessment) for further details

Measure	Finding	Description
<p>Compliance with Standards</p>	<p>F-ATC-17-04: ATCM supervisors are not performing quality control checks as required in Maintenance Control Policy.</p> <p><u>Governance Risk</u> Moderate (3,4) ■</p>	<ul style="list-style-type: none"> - Per ATCM's maintenance control policy, supervisors are required to perform site evaluations to ensure compliance with safety rules and procedures. The structure of the compliance check process uses two levels of checks to provide effective oversight: Level 1 (shift supervisors performing site evaluations once a week) and Level 2 (area supervisors checking on site evaluations conducted in Level 1 once a month). - ATCM did not produce any evidence that Level 1 or Level 2 evaluations were performed. - Quality control checks are limited to RWP and do not contain requirements for observation of maintenance activities (preventative and corrective maintenance). - CAPs have previously been issued pertaining to supervisory quality control and/or spot checks (TOC-ATC-15-006, TOC-ATC-15-011) <p>Recommendation: Establish controls to ensure supervisory quality control checks are completed, including items related to safety and maintenance activities</p> <p><i>(Source: ATCM Maintenance Control Policy)</i></p>
<p>Records Management</p>	<p>F-ATC-17-05: QICO could not identify applicable work orders when reviewing completed Preventative Maintenance (PM) data sheets.</p> <p><u>Operational Risk</u> Low (2,4) ■</p>	<ul style="list-style-type: none"> - QICO reviewed preventative maintenance (PM) data sheets from the Alexandria Yard (C99) Field Office. Some mechanics include a Maximo work order number on data sheets and some do not. The benefit of having the work order number is for a point of reference for the shift supervisor when reviewing PM data sheets and for when the mechanic has to input information in Maximo for that particular PM. - PM data sheets do not contain a field to capture applicable work order numbers. Some mechanics write-in work order numbers on their data sheets, while others do not. <p>Recommendation: Coordinate the implementation of a Work Order (WO) number field in all Preventative Maintenance Data Sheets.</p> <p><i>(Source: PM Data Sheets from C99 Alexandria Yard Field Office) (Reference 2)</i></p>

4 AREAS FOR IMPROVEMENT

Note: Findings are rated based on the associated risk to organization's objective, provided as Type of Risk followed by Risk Severity (Impact rating, Probability rating) color coding. Refer to [Appendix A](#) (Risk Assessment) for further details

Measure	Finding	Description
Records Management	<p>F-ATC-17-06: Several Preventative Maintenance Work Orders (WOs) in the enterprise asset management database (Maximo) does not contain the current revised version of instructions and/or sample data sheets.</p> <p><u>Operational Risk Elevated (3,5)</u> ■</p>	<ul style="list-style-type: none"> - Preventative Maintenance Instructions (PMIs) and a sample data sheet are attached to Preventative Maintenance Work Orders (WOs) in Maximo for mechanics to use in the field. - Inaccurate instructions and data sheets can be inadvertently used by mechanics in the field, possibly leading to misguided maintenance being performed or inexact records (e.g. B04 Interlocking Inspection (WO#13320187), Maximo version: Revision 1.0, 08/14 and current version: Revision 2.0, 01/16). - Engineering and Architecture (ENGA) Automatic Train Control Branch are responsible for updating Instructions and data sheets for maintenance use. The ATC engineering group stated instructions are updated more often than the associated data sheets; therefore, there is occasionally a difference in control numbers. <p>Recommendation: Establish requirements to update Maximo when preventative maintenance instructions and data sheets are changed or revised. Implement supervisory controls to ensure accurate records are maintained.</p> <p><i>(Source: Maximo Work Order Screenshot) (Reference 5)</i></p>
Records Management	<p>F-ATC-17-07: ATC corrective maintenance records, as identified in the enterprise asset management database (Maximo), indicate a backlog of open work orders dating back to 2012.</p> <p><u>Operational Risk Elevated (3,5)</u> ■</p>	<ul style="list-style-type: none"> - QICO performed a query of the Authority's enterprise asset management system (Maximo) of all ATCM corrective maintenance work orders. ATC has a total of 434 unclosed work orders between 1/1/2012 and 1/1/2017, with 66 "WAPPR" (waiting approval), 187 "APPR" (approved but no work undertaken), 41 "IN-PRG" (work in-progress), 28 "FINISHED" (work completed but requires supervisory quality review and completion), and 112 with other work order statuses. - The ATC maintenance repair shop in Maximo contains over 750 unclosed work orders from SAMS (Shops and Material Support Section), which makes querying the system difficult. - Per ATCM's maintenance control policy, aged work orders over 90 days should be reviewed monthly by the Assistant General Superintendent for appropriateness of efforts to resolve the deferral. <p>Recommendation: Verify the current status of open work orders, updating the database to reflect current status. Implement supervisory controls to ensure accurate status of work orders.</p> <p><i>(Source: Maximo Query, Retrieved 4/20/2017)</i></p>

4 AREAS FOR IMPROVEMENT

Note: Findings are rated based on the associated risk to organization's objective, provided as Type of Risk followed by Risk Severity (Impact rating, Probability rating) color coding. Refer to [Appendix A](#) (Risk Assessment) for further details

Measure	Finding	Description
Records Management	<p>F-ATC-17-08: ATC Maintenance utilizes only paper records for preventative maintenance inspection data sheets.</p> <p>Operational Risk Low (2,3) ■</p>	<ul style="list-style-type: none"> - ATCM stores its preventative maintenance data sheets (e.g. ATC-1000 Form 1008) in paper form in Train Control Rooms (TCRs) and Field Offices. There are no electronic copies of these sheets, either in PDF form or for the corresponding Maximo work order. - The corresponding Maximo work order is only utilized for labor reporting. Shift supervisors review the Maximo labor report and the physical copies of the preventative maintenance data sheet. Area Managers set the status of the inspection to "CLOSE" without reviewing the inspection data sheet (just the labor report). <p>Recommendation: Establish requirements to capture and store documentation of completed inspections/maintenance, exploring the possibility of utilizing the enterprise asset management database (Maximo).</p> <p><i>(Source: Preventative Maintenance Field Inspection Reports) (Appendix E)</i></p>

5 OTHER OBSERVATIONS

Measure	Observation	Description
Quality of Work	<p>ATC manpower could be better utilized after completing simple preventative maintenance work or after being denied track access..</p>	<ul style="list-style-type: none"> - QICO observed a Preventive Maintenance (PM) inspection of the (B04) Rhode Island Metro Station Interlocking, which was completed in 45 minutes after gaining track access. Both before and after the inspection, ATC employees were on emergency response standby. - During (E01) Mt. Vernon Square Metro Station Switch Obstruction Preventative Maintenance Assessment on 3-22-17, maintenance personnel were denied track access to perform a preventative maintenance task. - For five (5) out of the last nine (9) months, ATCM failed to meet its maintenance control policy requirement of 98% completion of scheduled preventative maintenance (Appendix E). <p><i>(Source: MPLN Monthly Preventive Maintenance Summary) (Reference 4)</i></p>

6 SUMMARY OF REQUIRED ACTIONS

Note: Findings are rated based on the associated risk to organization's objectives, provided as Type of Risk followed by Risk Severity (Impact rating, Probability rating) Color Coding. Refer to [Appendix A](#) (Risk Assessment) for further details.

Required Action	Finding	Owner
<p>QICO-ATC-17-01</p> <p>Establish clear training requirements for each mechanic grade including periodicity and develop methods of capturing on-the-job training in accordance with ATCM's Maintenance Control Policy. Develop a training plan to comply with updated requirements.</p> <p>4/Elevated ■</p>	<p>F-ATC-17-02 ■</p> <p>ATCM's Maintenance Control Policy does not outline technical training required for mechanics or supervisors, according to grade or experience.</p>	<p>ATCM, TSMT</p>
<p>QICO-ATC-17-02</p> <p>Review and perform necessary revision to maintenance documentation, including the Maintenance Control Policy (MCP), and establish supervisory control to ensure compliance with updated requirements.</p> <p>3/Moderate ■</p>	<p>F-ATC-17-03 ■</p> <p>Inconsistent communication between successive shifts on Corrective Maintenance work orders in the enterprise asset management database (Maximo) results in ineffective record keeping of work completed during each shift.</p>	<p>ATCM</p>
	<p>F-ATC-17-04 ■</p> <p>ATCM supervisors are not performing quality control checks as required in ATCM's Maintenance Control Policy.</p>	<p>ATCM</p>
	<p>F-ATC-17-05 ■</p> <p>QICO could not identify applicable work orders when reviewing completed Preventative Maintenance (PM) data sheets.</p>	<p>ATCM, ENGA</p>
	<p>F-ATC-17-06 ■</p> <p>Several Preventative Maintenance Work Orders (WOs) in the enterprise asset management database (Maximo) does not contain the current revised version of instructions and/or sample data sheets.</p>	<p>ATCM, ENGA</p>
	<p>F-ATC-17-07 ■</p> <p>ATC corrective maintenance records, as identified in the enterprise asset management database (Maximo), indicate a backlog of open work orders dating back to 2012.</p>	<p>ATCM</p>

	<p>F-ATC-17-08 ■ ATC Maintenance utilizes only paper records for preventative maintenance inspection data sheets. ATCM</p>
<p>QICO-ATC-17-03</p> <p>Develop a process to determine which groups receive precedence or priority for track access maximize time available to complete critical maintenance/inspection activities.</p> <p>3/Moderate ■</p>	<p>F-ATC-17-01 ■ ATC mechanics encounter delays obtaining access to the roadway for preventative maintenance inspections. RTRA</p>
<p>These required actions are composed of corresponding findings and recommendations listed in the previous sections of this document. Response to these items is required within 30 days of this report's publication, including assignment of action owners, proposed actions, and estimated completion dates. QICO will provide any additional guidance and/or clarification necessary through the development of corrective action plans (CAPs).</p>	

7 CORRECTIVE ACTION PLANS


INTERNAL REVIEW

Metro's Structure Inspections

In response to the internal review report for Metrorail's Automatic Train Control Inspection and Maintenance dated May 4, 2017. QICO has coordinated with Operations and Engineering departments to develop three 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)

6/19/2017
Date

WMATA INTERNAL OVERSIGHT

Corrective Action Plan (CAP) Acknowledgement



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

06/19/17
Date



Eric Christensen
Chief, Internal Compliance (INCP)

6/19/17
Date



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

6/20/17
Date



CORRECTIVE ACTION PLAN

Purpose and Scope

On May 4, 2017 QICO issued an internal review of Metrorail's Automatic Train Control Inspection and Maintenance. This Corrective Action Plan (CAP) has been developed to address the following finding and required actions per QICO-ATC-17-01.

QICO Finding

F-ATC-17-02: The ATCM Maintenance Control Policy does not outline technical training required for mechanics or supervisors, according to grade or experience.

QICO Recommendation

-Establish clear training requirements for each mechanic grade including periodicity and develop methods of capturing on-the-job training in accordance with the Maintenance Control Policy. Develop training plan to comply with updated requirements.

Required Action

QICO-ATC-17-01: Establish clear training requirements for each mechanic grade including periodicity and develop methods of capturing on-the-job training in accordance with ATCM's Maintenance Control Policy. Develop training plan to comply with updated requirements.

(Risk Rating: Elevated) ■

Plan Description

Operations Management Services (OPMS) and Automatic Train Control Maintenance (ATCM) will finalize the training matrix identifying training requirements and frequencies by mechanic level. The mentoring program that was created in response to FTA SMI CAP R-2-16-d by OPMS contains an On-the-Job Training (OJT) log that addresses documenting OJT activities by required ATC competencies. OPMS and ATCM are reviewing and documenting the on-the-job training requirements. ATCM will issue a department Policy outlining these requirements.

Business Impact – Budget/Cost Estimate

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

PLAN SCHEDULE

Actionable items		Description	Responsible Party*	Estimated Start	Estimated Completion
1	Training Matrix	Working with ATCM management to finalize training matrix that identifies training requirements for each ATC mechanic levels.	Linda Stoffregen (OPMS)	06/12/17	10/02/17
2	On-the-Job Training (OJT)	OPMS and ATCM will review and document the on-the-job training requirements.	Linda Stoffregen (OPMS)	06/12/17	10/02/17



PLAN SCHEDULE

Actionable items		Description	Responsible Party*	Estimated Start	Estimated Completion
3	Policy and Instruction	Issue an ATCM Policy and Instruction detailing the on-the-job-training requirements and training matrix.	Jerry Flanders (ATCM)	10/02/17	10/31/17
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	10/31/17	11/27/17

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

COMPLETION DOCUMENTATION

Performance Measures

- 100% completion of training matrix.
- 100% completion of ATCM Policy and Instruction detailing the on-the-job-training requirements

RESPONSIBLE PARTIES

ATCM	Jerry Flanders	
OPMS	Linda Stoffregen	

SECOND LEVEL RESPONSIBILITY

AGM RAIL	Andrew Off	
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CORRECTIVE ACTION PLAN

Purpose and Scope

On May 4, 2017 QICO issued an internal review of Metrorail’s Automatic Train Control Inspection and Maintenance. This Corrective Action Plan (CAP) has been developed to address the following finding and required actions per QICO-ATC-17-02.

QICO Finding

QICO Recommendation

F-ATC-17-03: Inconsistent communication between successive shifts on corrective maintenance work orders in Maximo results in ineffective record keeping of work completed during each shift.

Establish shift turnover standards, including requirements for documenting work completed and any issues that occur during each shift for communication to the oncoming crew.

F-ATC-17-04: ATCM supervisors are not performing quality control checks as required in ATCM’s Maintenance Control Policy.

Establish controls to ensure supervisory quality control checks are completed, including items related to safety and maintenance activities.

F-ATC-17-05: QICO could not identify applicable work orders when reviewing completed Preventative Maintenance (PM) data sheets.

Coordinate the implementation of a Work Order (WO) number field in all Preventative Maintenance Data Sheets.

F-ATC-17-06: Preventative Maintenance Work Orders (WOs) in the enterprise asset management database (Maximo) does not contain the current revised versions of instructions and/or sample data sheets.

Establish requirements to update Maximo when preventative maintenance instructions and data sheets are changed or revised. Implement supervisory controls to ensure accurate records are maintained.

F-ATC-17-07: ATC corrective maintenance records, as identified in the enterprise asset management database (Maximo), indicate a backlog of open work orders dating back to 2012.

Verify the current status of open work orders, updating the database to reflect current status. Implement supervisory controls to ensure accurate status of work orders.

F-ATC-17-08: ATC Maintenance utilizes only paper records for preventative maintenance inspection data sheets.

Establish requirements to capture and store documentation of completed inspections/maintenance, exploring the possibility of utilizing the enterprise asset management database (MAXIMO).

Required Action

QICO-ATC-17-02: Review and perform necessary revision to maintenance documentation, including the Maintenance Control Policy (MCP), and establish supervisory updated requirements.

(Risk Rating: Moderate)

Plan Description

F-ATC-17-03: Automatic Train Control Maintenance (ATCM) developed a SharePoint as an internal communication resource between shifts. Personnel will be trained on the use of this comprehensive data which will include labor resource data. In addition ATCM will provide all maintenance personnel with written instructions on how to complete corrective maintenance work orders in Maximo.

F-ATC-17-04: ATCM has established requirements and procedures in its Maintenance Control Policy (MCP) for quality control/compliance spot checks (level 1), spot checks of supervisor work (level 2) and resulting documentation to be completed by each supervisor. This includes reviewing data sheets and adding defects to new work orders. ATCM will provide completed PMs for review.

F-ATC-17-05: Rail Services (RAIL) will review all inspection & preventative maintenance data sheets to determine an efficient way to link to the issued work order and establish a policy to implement the results of data sheet analysis.

F-ATC-17-06: Engineering realized having different revision levels for procedures and datasheets can create confusion. To overcome the potential confusion, engineering will state within the procedure the revision level for the associated datasheet as well. This will help both maintenance and any auditors confirm the correct datasheets are being used. Language will be included in the next revision of the ATC-4000 to require datasheet revision levels to be entered on all ATC procedures. The updated 4K manual is expected to be ready for review by September 2017 and an expected implementation before the end of the year.

F-ATC-17-07: Automatic Train Control Maintenance (ATCM) will establish a team to review and close open work orders. The team has already started the process, the issue is that it's not just Corrective Maintenance (CM) work orders. ATCM will create a complete list of the backlogged open work orders disclosing the different types & give quarterly updates on the progress made closing out the open work orders as time permits.

F-ATC-17-08: RAIL will analyze options to efficiently capture and store documentation of completed inspections/maintenance for TRST, TRPM and ATCM.

Business Impact – Budget/Cost Estimate

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

PLAN SCHEDULE

Actionable items		Description	Responsible Party*	Estimated Start	Estimated Completion
1	Screenshots of SharePoint	Screenshots of SharePoint and training instructions.	Jerry Flanders (ATCM)	07/05/17	07/31/17
2	Acknowledgement of use of SharePoint	Memorandum notice that the new ATCM SharePoint is an additional tool for shift turnover communication between shifts.	Jerry Flanders (ATCM)	07/05/17	08/31/17
3	Maximo Work Order Instructions- Supervisors	Revise current written instructions on how to create a detailed account of work performed on corrective maintenance work orders in Maximo.	Jerry Flanders (ATCM)	07/05/17	08/31/17

4	Implementation of new quality control/compliance spot check procedure in Maintenance Control Policy	Procedures for quality control/compliance spot checks (level 1), spot checks of Supervisor's work (level 2) including reviewing data sheets and work orders.	Jerry Flanders (ATCM)	07/05/17	07/31/17
5	Completed Preventative Maintenance's (PMs)	Provide copies of completed quality control spot check Preventative Maintenance's (PMs).	Jerry Flanders (ATCM)	07/05/17	09/28/17
6	Review all inspection & Preventative Maintenance Data Sheets	Review inspection and preventative maintenance data sheets to determine the most efficient means of linking them to work orders issued through the Maximo system for Rail Maintenance groups.	Andrew Off (RAIL)	07/03/17	12/29/17
7	Create a RAIL policy to link data sheets to work orders	Establish a policy to implement the results of data sheet analysis.	Andrew Off (RAIL)	01/02/18	01/31/18
8	Draft ATC- 4000	Draft copy of System configuration management Plan instructions and procedures (ATC 4000) manual - Language will be included to require datasheet revision levels to be entered on all ATC procedures.	Ed Popa (ENGA)	07/03/17	09/27/17
9	Final ATC- 4000	Approved copy of System configuration management Plan instructions and procedures (ATC 4000) manual - Language will be included to require datasheet revision levels to be entered on all ATC procedures.	Ed Popa (ENGA)	07/03/17	01/15/18
10	Progress Reports- Closed Work Orders	Quarterly updates on the progress made closing out backlogged open work orders.	Jerry Flanders (ATCM)	07/03/17	03/20/18
10.1	Quarterly Closed Work Orders-1	Quarterly updates on the progress made closing out backlogged open work orders.	Jerry Flanders (ATCM)	07/03/17	09/20/17
10.2	Quarterly Closed Work Orders-2	Quarterly updates on the progress made closing out backlogged open work orders.	Jerry Flanders (ATCM)	09/20/17	12/20/17
10.3	Quarterly Closed Work Orders-3	Quarterly updates on the progress made closing out backlogged open work orders.	Jerry Flanders (ATCM)	12/20/17	03/20/18
11	Review options to capture and store documentation	Analyze options to efficiently capture and store documentation of completed inspections/maintenance for TRST, TRPM and ATCM.	Francesco Palmeri (RCMP)	07/03/17	12/27/17



12	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	03/20/18	04/18/18
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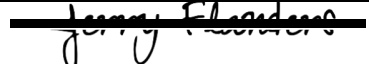

*In the event of personnel or departmental changes, responsibilities for actionable items shall transfer to the new leadership.

COMPLETION DOCUMENTATION

Performance Measures

- 95% of ATC supervisor's signature acknowledgement of new ATCM SharePoint's function as prescribed under actionable item #2.
- Evidence of revised written instructions as prescribed under actionable item #3.
- Evidence of the implementation of new procedure in the Maintenance Control Policy as prescribed under actionable item #4.
- Provide copies of completed quality control spot check Preventative Maintenance's (PMs) performed over a span of two (2) months as prescribed under actionable item #5.
- Final copy of RAIL policy as prescribed under actionable item #7.
- Final copy of revised ATC 4000 manual as prescribed under actionable item #9.
- 70% completion of the closeout of backlogged open work orders(as of 7/1/17) as prescribed under actionable item #10.
- Evidence of developed P/I outlining management responsibilities on electronic submission and review of records as prescribed under actionable item #11.

RESPONSIBLE PARTIES

DECO	Ed Popa	
ATCM	Jerry Flanders	
RCMP	Francesco Palmeri	

SECOND LEVEL RESPONSIBILITY

AGM RAIL	Andrew Off	
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CORRECTIVE ACTION PLAN

Purpose and Scope

On May 2, 2017 QICO issued an internal review into Metrorail's Automatic Train Control Inspection and Maintenance. This Corrective Action Plan (CAP) has been developed to address the following finding and required actions per QICO-ATC-17-03.

QICO Finding

QICO Recommendation

F-ATC-17-01: The ATC mechanics encounter delays obtaining access to the roadway for preventative maintenance inspections.

-Develop a process to determine which groups receive precedence or priority for track access, maximizing time available to complete critical maintenance/inspection activities.

Required Action

QICO-ATC-17-03: Develop a process to determine which groups receive precedence or priority for track access maximize time available to complete critical maintenance/inspection activities.

(Risk Rating: Moderate)

Plan Description

F-ATC-17-03: Given the complex challenges of working on an operating railroad and numerous issues that can disrupt planned work, the key metrics tracked with respect to Preventative Maintenance Instruction (PMI) and inspections are the completed percentage of work (measured monthly) and the quality of those inspections. Rail will establish a weekly meeting to review incidents, trends and Rail initiatives. Once a month, this meeting will review the PMI and inspection percentage completed and determine if any group needs additional resources or prioritization for ROW to complete inspections. This prioritization will also include assessment of planned capital and preventive maintenance work.

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.

PLAN SCHEDULE

Actionable items		Description	Responsible Party	Estimated Start	Estimated Completion
1	Roadway Access – Preventative Maintenance Inspection (PMI) Monthly Meeting Minutes	Monthly meetings will include a review of ongoing track inspection and PMI activities to determine the needs of maintenance and inspection groups and establish prioritization for ROW access.	Andrew Off (RAIL)	07/27/17	10/30/17



PLAN SCHEDULE

Actionable items		Description	Responsible Party	Estimated Start	Estimated Completion
2	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	10/30/17	11/28/17

COMPLETION DOCUMENTATION

Performance Measures

- Rail Operations Control Center (ROCC) tracking for track access requests indicates number of approved vs. denied requests.

RESPONSIBLE PARTIES

Rail	Andrew Off	
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8 SUPPLEMENTAL MATERIALS

8.1 APPENDIX A: RISK ASSESSMENT

Risk Assessment

What is Risk?

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

- *Safety* – Risk associated with harm to customers and employees and critical equipment or asset safety
- *Governance* – Risks associated with internal controls and compliance
- *Operational* – Risk related to inefficient and ineffective business processes, disruption to normal business operations, non-compliance, negative public relations, breach to physical security, etc.
- *External* – Risks related to changing regulations, unfavourable economic conditions, industry or customer needs change, litigation and damage/loss to company assets
- *Financial* – Risks associated with uncollectable receivables, incorrect financial models or analysis, fluctuation in capital levels and adverse movement of interest rates
- *Technological* – Risk associated with unauthorized access to

information, unavailable or unreliable information, technology not meeting business needs and compromised information security

Risk Assessment

The following risk matrix (Figure 1) was 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 probability of occurrence (see vertical axis in Figure 1) and the significance of their impact (see horizontal 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)

Figure 1 : Risk Assessment Matrix

		↑	Low	Moderate	Elevated	High	High	
Almost Certain (5)	Probability of Occurrence		Low	Low	Moderate	Elevated	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								
Impact		←	Potential Impact of Risk					→
			Negligible (1)	Minor (2)	Moderate (3)	Significant (4)	Major (5)	

8.1 APPENDIX A: RISK ASSESSMENT

Risk Assessment

Probability of Occurrence of Risk Events Defined

Rare | 1 – Reasonable assumption that this risk will not occur

Likely | 4 – Reasonable assumption that this risk will likely occur

Unlikely | 2 – Reasonable assumption that this risk will likely not occur

Almost Certain | 5 – Reasonable assumption that this will occur

Possible | 3 – Reasonable assumption that this risk may occur

Potential Impact of Risk Events Defined

Negligible | 1 – Unlikely to cause the activity to fail to meet part of its objectives.

Significant | 4 – 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.

Minor | 2 – 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.

Major | 5 – 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.

Moderate | 3 – 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 significant financial losses, reductions to or ineffectiveness of operations, non-compliance with laws and regulations, sizable waste of resources, etc.

8.2 APPENDIX B: ATC ORGANIZATIONAL ROLES

ATC Organizational Roles

Three groups at Metrorail handle initiatives regarding Automatic Train Control:

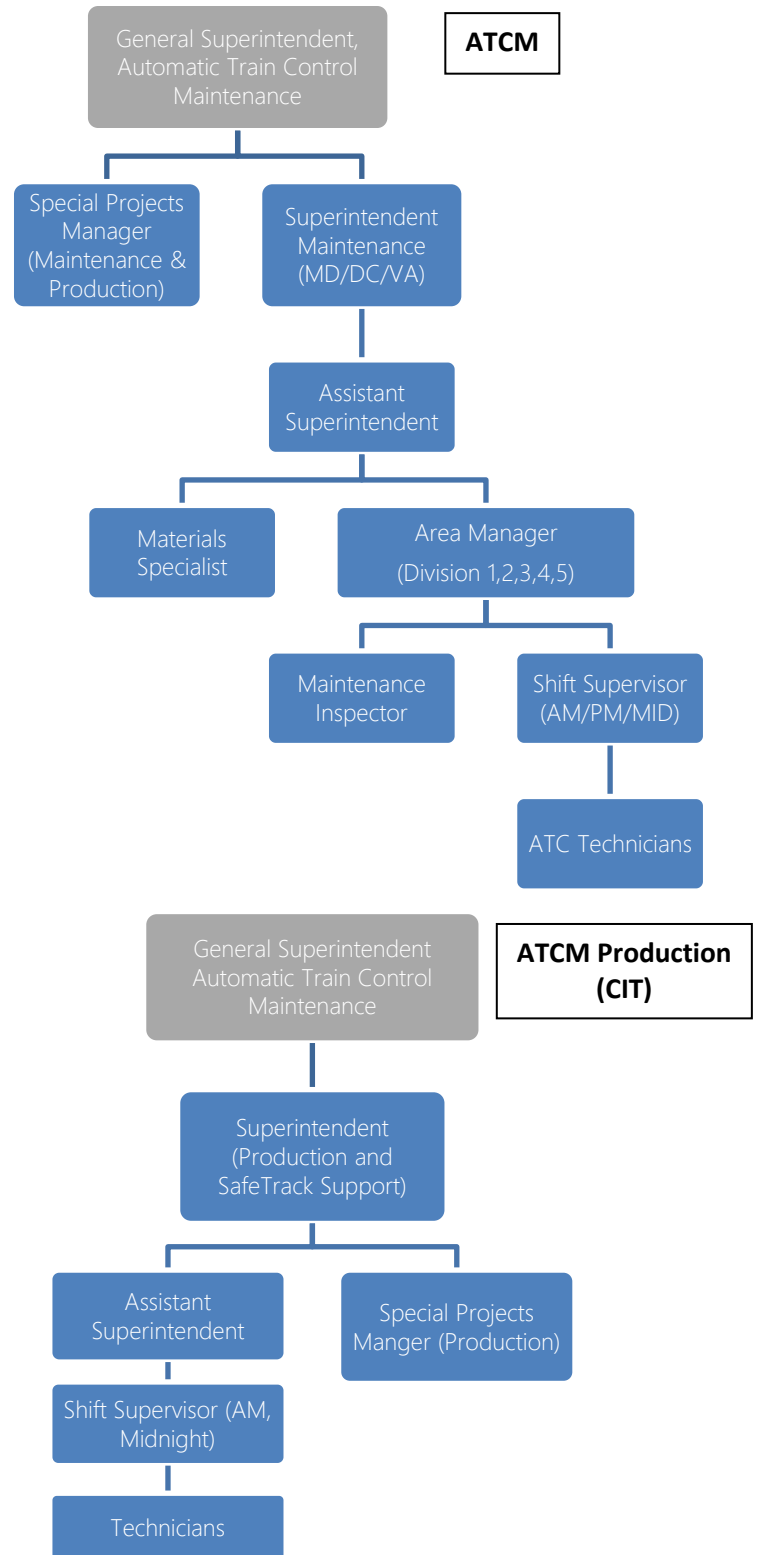
- 1) ATC Engineering – responsible for WMATA ATC standards and specifications, approving ATC parts for installation system-wide, producing Engineering Modification Instructions (EMI) and performing incident investigation.
- 2) ATC Construction, Installation and Testing (CIT) – responsible for large-scale replacement of ATC parts (e.g. upgrading impedance bonds) and supporting SafeTrack.
- 3) ATC Maintenance – responsible for emergency corrective maintenance and performing preventative maintenance inspections for ATC components (e.g. switch inspections).

ATC Engineering reports to the Director of Engineering & Architecture. It is not under operations, and was not a focus of QICO’s review. Both ATC-CIT and ATC Maintenance are under the department “ATC Maintenance (ATCM),” which reports to the Assistant General Manager of Rail Services (RAIL).

ATCM Maintenance has a total workforce of 212 technicians, 28 supervisors, and five (5) managers under the ATC General Superintendent. It is both divided geographically (into five regions, each administered by an area manager) and temporally (three shifts, 0630-1430, 1430-2230, 2230-0630, administered by shift supervisors). Each supervisor oversees technicians, which are graded by class (AA, A, B, C, and Helper). Supporting roles include Materials Specialists (availability of tools and parts), Maintenance Inspectors (shift supervisors that provide on-the-job training, but have no direct reports) and Special Projects Managers. ATC Production, in contrast to ATCM, is not geographically separated; technicians report to shift supervisors and are deployed system-wide as necessary.

ATCM Maintenance Workforce Snapshot					
Division	#1	# 2	# 3	#4	#5
Service Area (Line)	A, B1-B6	J,K	D,F,G	E, B6-B11	N
Supervisors	6	6	6	9	3
Technicians	46	46	49	49	22



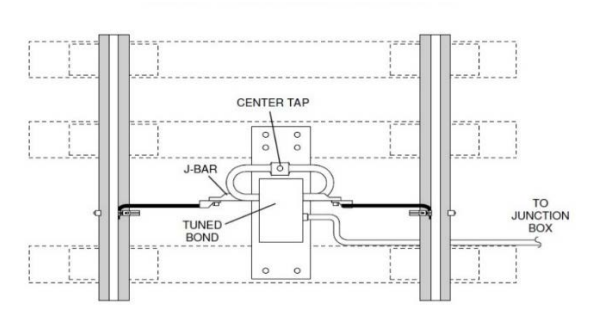

Source: ATCM March 2017 System Pick



8.3 APPENDIX C: TECHNICAL TERMINOLOGY

Definitions	Photos
<p>Automatic Train Control (ATC)</p> <p>Automatic Train Control (ATC) is a general class of train protection systems for railways that involves a speed control mechanism in response to external inputs. At WMATA, ATC is comprised of three subsystems: Automatic Train Protection (ATP), Automatic Train Operation (ATO), and Automatic Train Supervision (ATS).</p>	
<p>Automatic Train Operation (ATO)</p> <p>The Automatic Train Operation (ATO) System is that part of the ATC System which provides automatic train stopping and starting at passenger station platforms and provides speed control compensation for varying conditions of grade and curvature. The programmed station stop speed profile is generated in the train based on proximity sensors in the track wayside that signal to the train the presence of and distance to an upcoming station platform.</p>	
<p>Automatic Train Protection (ATP)</p> <p>The Automatic Train Protection (ATP) System is that part of the ATC System whose primary purpose is to maintain train separation through the Automatic Block Signalling System and issue limiting speed commands. These commands are generated by the local Train Control Room (TCR).</p>	
<p>Automatic Train Supervision (ATS)</p> <p>The ATS system is designed to control train routing and scheduling. Scheduling is accomplished first by automatic equipment at the wayside, then, second, by computer programs at the OCC, which are automatically triggered when necessary to provide for minor schedule adjustments to maintain traffic flow and scheduling.</p>	
<p>Maximo</p> <p>Maximo is WMATA's maintenance management system used for work order, incident, and track defect tracking. Maximo Work Orders (WO) specify a particular task and the labor, materials, services, and tools required to complete the task.</p>	

8.3 APPENDIX C: TECHNICAL TERMINOLOGY

Definitions	Photos
<p>Operations Control Center (OCC) / Maintenance Operations Control (MOC)</p> <p>Train operations on the Metrorail system are carried out under the authority and supervision of the Metrorail Operations Control Center (OCC/ROC), located at Carmen Turner Facility (CTF). Maintenance Operations Control (MOC) handles the dispatching of emergency maintenance teams.</p>	 A photograph of a large, modern control room. The room features multiple large projection screens displaying various data and maps. Several people are seated at desks, working at their stations. The room has a high ceiling with recessed lighting and large windows on the right side.
<p>Speed Restriction</p> <p>A given speed less than the normal operating speed for a section for track or rail vehicle/equipment. This speed is imposed by verbal instructions, written notices (i.e. RSA's or general orders), flagging procedures and/or speed commands issued by ROCC to mitigate special situations.</p>	 A close-up photograph of a control panel. It features a blue background with white text. On the left, there is a label "SPEED RESTRICTION" and a "NORMAL MOTS" button. On the right, there is a "RECEIVER POWER ON" label and a "MEDIUM STOP" button. A small black rectangular area is visible on the right side of the panel.
<p>Track Circuits</p> <p>The Automatic Block Signalling System, which is the wayside portion of the Automatic Train Protection (ATP) System, is comprised of calculated track circuits to provide maximum capacity and safe breaking distance for following trains. Impedance bonds (Wee-Zee, or WZ Bonds) are an integral part of the track circuit. For Automatic Train Control, each impedance bond acts as a transmitter for one track circuit and a receiver for the adjacent track circuit.</p>	 A schematic diagram of a track circuit. It shows two vertical lines representing tracks. A central component is labeled "CENTER TAP". Below it, a "J-BAR" is connected to the tracks. A "TUNED BOND" is also shown, connecting the tracks. An arrow on the right points to a "TO JUNCTION BOX".
<p>Train Control Room (TCR)</p> <p>The electronic and electrical components necessary to implement the ATP, ATS, and ATO subsystems are mounted on racks in train control rooms located at each Metrorail passenger station. Each train control room contains the electronics associated with the track circuits monitored and controlled from that location.</p>	 A photograph of a long, narrow room filled with electronic equipment. The room is lined with racks of components, including what appear to be control panels and wiring. A person is visible in the distance, working at a desk. The room is well-lit and organized.

8.4 Appendix D: QICO INTERVIEWS OF KEY PERSONNEL



Quality Assurance, Internal Compliance & Oversight

Interview (Questionnaire) Notes

QICO PROGRAM	Automatic Train Control (ATC) Audit		
LOCATION	(Questionnaire)	DATE:	4/14/2017
		TIME:	N/A

Background Information		
[REDACTED]	Quality Assurance Officer (Auditor)	QICO: Infrastructure Assurance
[REDACTED]	Area Manager	RAIL:ATCM
[REDACTED]	Area Manager	RAIL:ATCM
[REDACTED]	Area Manager	RAIL:ATCM
[REDACTED]	Area Manager	RAIL:ATCM

Interview Notes		
Category	Question	Response (adjustments in brackets for readability)
Training	What training is available for all ATC mechanics, and do mechanics voluntarily sign up?	<ul style="list-style-type: none"> - There is one ATC Track Circuit Class (OPRSTTRACKCKTS) available and it's already filled. They use the Enterprise Learning Management (ELM) system to sign up for the class, which is approved by ATC training and the supervisor. Many mechanics volunteer for training. ([REDACTED]) - No, [training is] not available for all mechanics. They are signed up usually by hire date when the Journeyman's class becomes available. ([REDACTED])
Training	What are the qualifications of new hires?	<ul style="list-style-type: none"> - We are hiring more qualified techs. Unfortunately, we are stuck with the group of techs that were not properly screened. ([REDACTED]) - There was mandatory hiring several years ago which bypassed the normal qualification testing. There were many individuals hired that were not qualified for ATC. The process now is much better. There is written test and verbal interview. ([REDACTED]) - We are currently hiring qualified individuals. Candidates have to go through the screening process. Unfortunately, we are stuck with the group of techs that were not properly screened in the past. ([REDACTED]) - Current hires in the last year are much better. ([REDACTED])
Business Practices	Why is there a "skeleton shift" (half manpower) from Friday through Monday?	<ul style="list-style-type: none"> - In order to cover the weekends, techs are scheduled Sunday through Thursday and Tuesday through Saturday. [Because of overlap], there is only a four (4)-man crew on Mondays and Fridays. They are capable of performing most Preventative Maintenance Inspections (PMIs). ([REDACTED]) - For Sunday, Monday, Friday and Saturday we do not have full crews; many PMI's can [still] be done. However, if there are [contingencies] (single tracking, vacations, sickness, or inclement weather), this can prevent PMI's that require more than 3 people [from being

Interview Notes		
Category	Question	Response (adjustments in brackets for readability)
		<p>completed]; RWP standards require extra people for certain types of jobs. ([REDACTED])</p> <ul style="list-style-type: none"> - We have a four mechanics for Sat-Sun; that's enough to perform CMs and PMs. We need more staff on Friday and Monday because of rush hour. ([REDACTED]) - In order to have sufficient personnel on weekends Sat and Sun we are forced to have less on Mon and Fri, due to lack of personnel. One problem on a Monday or Friday prevents [a crew from] performing a PMI on those days as we don't have a second crew to perform the PMI. ([REDACTED])
Business Practices	How exactly does "The Pick" process work? Are there disadvantages?	<ul style="list-style-type: none"> - Location and time slots [day, evening, night] are picked in the order of seniority [within their classification]. Personnel lose seniority if they are promoted to a higher class. ([REDACTED]) - Depending on the number of personnel at each labor grade will decide slots on pick. We are in dire need of experienced AA's. Many people will not promote because it will greatly limit their options. When you promote your seniority is lower and he get stuck on bad shifts and or locations. ([REDACTED]) - The pick is based on seniority. The disadvantage is that we sometimes cannot get experienced tech work in the older areas [needing more work]. Most pick where there are less problems. Personnel are reluctant to be promoted because of the pick location and shift. ([REDACTED]) - The pick incorporates additions/modifications to the previous pick. Region managers can modify days off for techs but cannot get additional personnel. Supervisors end up training personnel who go elsewhere during the next pick. Techs are reluctant to be promoted as they may have to move to a new location. ([REDACTED])
Business Processes	How do maintenance personnel request parts?	<ul style="list-style-type: none"> - Typically through the supervisor. The better techs will check for themselves. ([REDACTED]) - Mechanics will notify the supervisor for parts needed, and the supervisor will order parts. The ATC parts system needs much improvement. It is hard to get parts on weekends from storerooms, because the clerks are not on duty. Some ATC parts are hard not in stock (several reasons). ([REDACTED]) - Maintenance personnel request parts through the on-duty supervisor. Inventory can be checked on Maximo. ([REDACTED])

Interview Notes		
Category	Question	Response (adjustments in brackets for readability)
		<ul style="list-style-type: none"> - Parts are requested via Maximo from the stockrooms. If the part is not available in stock, then we contact our parts specialist who usually manages to find the part in CIT stock. (██████████)
Track Access	Are there issues with accessing track for ATC personnel?	<ul style="list-style-type: none"> - Operations Control Center frequently does not grant [ATCM] permission [to enter the roadway], [and] does not always give a reason. The problem is particularly evident on midnight shift. (██████████) - ROCC will only allow certain number of crews on roadway at one time to work. Some ROCC personnel are more flexible than others. (██████████) - Normally OCC just tell them to "standby for train movement" even [if OCC] has an emergency ten stations away from the request location. (██████████) - OCC will say "Stand By" if they are busy. They seldom give a reason. There is now a limit as to how many crews they let out on the roadway. (██████████)
Records Management - Processes	How do you close PM Work Orders in Maximo?	<ul style="list-style-type: none"> - As a supervisor I will not close work orders until I have paperwork. It is a constant struggle for some mechanics to complete data sheets and turn [these in] in a timely manner. (██████████)
Records Management - Processes	How often are PM data sheets inadequately filled out by mechanics?	<ul style="list-style-type: none"> - I have to constantly remind mechanics, particularly at the start of a new pick. Mechanics will forget to sign or have incorrect data [on their sheets]. (██████████)
Records Management - Processes	Do all mechanics utilize the long description field in Maximo when closing out a CM?	<ul style="list-style-type: none"> - No. Again it is a constant struggle for mechanics to complete MAXIMO correctly for different reasons. Ignorance, laziness, don't care. (██████████) - Yes, they all use the long description. (██████████) - The data sheet is usually OK except for techs putting in the call number in the signature block. The actual data is usually entered correctly. - No. (██████████)
Track Access	Is the yard master a big issue for track access?	<ul style="list-style-type: none"> - Most yard masters have an excellent relationship with ATC. (██████████) - Yes. Tower operator have the mindset that it is "their yard." They don't understand ATC's role in keeping the yard in good operation. They are in control and it doesn't matter what ATC is trying to accomplish. Not all yard masters, but most. (██████████) - I haven't heard any big issues with yard masters granting track access. (██████████)

Interview Notes		
Category	Question	Response (adjustments in brackets for readability)
		<ul style="list-style-type: none"> - If there is a yard problem we can get quick access to the location. Cannot get access for PMIs during train putouts and layups. [REDACTED]
Performance of Work	Do you feel there are any language barrier issues with your personnel?	<ul style="list-style-type: none"> - Yes, there is constant misunderstanding - I have techs that will say yes to me no matter what I ask. ([REDACTED]) - Yes. This is a constant issue that we have learned to accept. We try our best to communicate as best we can without being offensive. There are many different languages. Some people have a hard time with English. ([REDACTED]) - No. ([REDACTED]) - There is a language and pronunciation issues with some techs. In the past we had sent personnel for remedial English class. ([REDACTED])
Performance of Work	How do you coordinate work with Production?	<ul style="list-style-type: none"> - No. This also needs improvement. I have personally reached out to CIT personnel. Through much pressure I have CIT send me data sheets of any bonds (high current) replaced in my area. ATC maintenance were not aware the CIT was working in our territory. This created problems when performing HFTC readings. Also we would respond to a problem to discover CIT was working in that location. Communication between Maintenance and CIT has needed improvement for the 20 years I have been here. I believe it is better if [they] both are under same manager. The manager needs to make sure there is communication. ([REDACTED]) - Yes. For SafeTrack work they always send us the end-of-shift report. They help us to get the MCM cables and WZ bonds. ([REDACTED]) - During a project like SafeTrack we have daily communication. Otherwise we do not. The complaint from mid-shift supervisors is they are unaware of production working at one of their locations unless there is an issue created by production work that they have to correct. ([REDACTED])
Performance of Work	Why do certain groups and shifts have more manpower than others?	<ul style="list-style-type: none"> - The size of territory (Interlockings, TCRs, etc). I have 19 stations including D98 (a problematic area). We now have 10 people. Every line needs at least 1 AA and a total of 8 people. You need to have at least 4 people for many of the PMI's (Switches, verifications, IDW). Sometime we need an extra person due to poor radio communication. ([REDACTED]) - It depends on the area. Some of get more manpower because that group covers more stations and [encounter] more problems. During AM and PM shifts, crews can work two areas at the same time. For

Interview Notes		
Category	Question	Response (adjustments in brackets for readability)
		<p>mid-shifts, they can only perform work in one location (also required setup work zones).</p> <ul style="list-style-type: none"> - Depends on number of standby locations and size of territory. ()
Business Processes	What is the benefit of having a 5-man crew as opposed to a 4-man crew?	<ul style="list-style-type: none"> - RWP. [A typical 4-man crew has a] RWIC, look-out, person on the panel, and personnel performing actual work. () - [A 5-man crew] helps us to perform inspections safer by having an extra look-out in a hot spot, who establishes better communication in the bad spot area. () - It is easier for the supervisor and AA to train more people at the same time. Work at some locations with blind spots requiring an advanced watchman/lookout results in a 5-man crew. ()
Business Processes	How do the various shifts (AM/PM/MID) communicate with each other?	<ul style="list-style-type: none"> - [The] incoming supervisor meets with outgoing supervisor. () - The supervisors send an e-mail (End of Shift Report) to the other supervisor in the division and upper management. Supervisors are supposed to see next shift and perform turnover. Logbook and MAXIMO are also supposed to be utilized. () - The [outgoing] supervisor sends the end-of-shift report to all supervisor staff within the division and also post the report on SharePoint. () - Supervisors give a turnover to the on-coming supervisor. Usually they see them in person if they are all located in the same field office (otherwise by phone or e-mail). Supervisors send an e-mail report on any issues of concern in their end-of-shift report. ()
RWP	Is safety a concern for your personnel?	<ul style="list-style-type: none"> - Yes. We know that ROCC cannot be trusted. I don't want to sound harsh, but many times ROCC gets caught up in the situation and can make mistakes. Everyone make mistakes. However, ROCC's mistakes can have costly effect. () - Always but they are all RWP qualified. I hope safety is always in the back of their mind. () - Safety is a paramount concern. Any person or crew going wayside has to follow RWP safety guidelines. ()



Quality Assurance, Internal Compliance & Oversight

Interview Notes

QICO PROGRAM	ATC Audit – Engineering Managers Interview		
LOCATION	Telegraph Road Facility	DATE:	3/6/2017
		TIME:	1300-1530

Background Information	
Name(s): [REDACTED] Position: ATC Engineering Management	Auditor: [REDACTED] (3/17/2017)

Interview Notes		
Category	Question	Response
Quality of Work	What is your background?	<ul style="list-style-type: none"> - [REDACTED] ([REDACTED]) Projects e.g. Silver Line, Fan Shaft Project, Gen I/II) - 17 years as a technician under system maintenance (AA) then moved on to engineering, 31 years, 9 week straight training class. - [REDACTED] ([REDACTED]) – Worked on Metro starting in 1977 (building the system), moved to Metro in 1987. - [REDACTED] ([REDACTED]) -9 months (Since 15 was trained in railways). Worked with Army Corp of Engineers, ATC technician in Romania, worked in Canada on projects, design engineer for JFK airport, came back to operations working with Pittsburgh.
Quality of Work	What is ATC Engineering's mission?	<ul style="list-style-type: none"> - Comprises of 15 engineers. They are performing field inspections around three times a week. - Functions as the keepers of standards and specifications. - Interfaces with equipment or parts manufacturers to identify any issue arises with manufacturers' equipment and find instructions to rectify issue). - Approves ATC parts for installation system-wide. - Modifies circuitry to accommodate shutdowns, support maintenance in person on any issues that arise, data collections, R&D for heater tape/wire. - Incident investigation (red signal overruns, analyze raw data and make a report). - Represents the Authority in legal matters related to ATC. - Respond to FTA Corrective Action Plans. - Manages sub-contractor Mott McDonald on new construction. - Distributes reports (Loss of Shunt Report) and reports to the COO every month about ATC issues. - Weekly meetings with maintenance leadership (730-830) to discuss maintenance leadership. - Temporary Configuration Plan (TCP) – when we change the equipment in any fashion. Example: temporarily disconnecting one end of a special

		trackwork while running trains on the other side. Opposing switches work in tandem, so it requires some changes.
Quality of Work	Are there issues obtaining the proper parts?	<ul style="list-style-type: none"> - [Impedance] Bonds have supply issues in the field because of poor planning, an inventory tracking issue, bonds take 6 months to reach WMATA after ordering them, we do not have a good escrow, personnel aren't ordering them in a timely fashion. Only one company provides us with bonds. - There should be a Min/Max system for each part in inventory. Also a First In First Out (FILO) or rotating stock for all parts to work properly when implemented into service (best practice for not allowing parts to sit for several years and then don't work in the field).
Quality of Work	Can ATC change the frequency of PMI's if they are too frequent?	<ul style="list-style-type: none"> - Changing the frequency on PMs can be an issue. It is dictated by the FRA standards.
Records Management	Does ATC have a systematic way to track assets?	<ul style="list-style-type: none"> - A few attempts have been made to track assets. An inventory snapshot was completed a few years ago through Procore. But things have gone in too many different directions. Power was doing Windchill, and ATC was doing Optram. Then leadership shut that down. - Maximo makes it confusing to properly categorize defects / problem codes for ATC. Then the long description is relied upon to actually describe what happened, which technicians don't necessarily use.
Quality of Work	Other Concerns	<ul style="list-style-type: none"> - The delay of ATO (Automatic Train Operation) is not ATC Engineering Problem. It is a result of the Pick (the operators have to be trained). The marker coils can be scanned by vehicle services to obtain a list of defective marker coils. 10 mph speed restrictions (SAFETY) is also a reason. - The GEN II project to replace dysfunctional bonds is 90-100% complete. - Engineering Change Bulletins, EMIs, and Configuration Control is a serious issue.



Quality Assurance, Internal Compliance & Oversight Interview (Questionnaire) Notes

QICO PROGRAM	Automatic Train Control (ATC) Audit		
LOCATION	(Questionnaire)	DATE:	4/14/2017
		TIME:	N/A

Background Information		
[REDACTED]	Quality Assurance Officer (Auditor)	QICO: Infrastructure Assurance
[REDACTED]	Shift Supervisor, ATCM	RAIL: Automatic Train Control Maint.
[REDACTED]	Shift Supervisor, ATCM	RAIL: Automatic Train Control Maint.
[REDACTED]	Shift Supervisor, ATCM	RAIL: Automatic Train Control Maint.
[REDACTED]	Shift Supervisor, ATCM	RAIL: Automatic Train Control Maint.
[REDACTED]	Shift Supervisor, ATCM	RAIL: Automatic Train Control Maint.
[REDACTED]	Shift Supervisor, ATCM	RAIL: Automatic Train Control Maint.
[REDACTED]	Shift Supervisor, ATCM	RAIL: Automatic Train Control Maint.
[REDACTED]	Shift Supervisor, ATCM	RAIL: Automatic Train Control Maint.
[REDACTED]	[REDACTED] ATC Shift Supervisor	RAIL: Automatic Train Control Maint.

Interview Notes		
Category	Question	Response (adjustments in brackets for readability)
Training	Is training available right now for all mechanics?	<ul style="list-style-type: none"> - There's a waiting list for the Journeyman's class. Maybe 10 percent volunteer for training classes. ([REDACTED]) - Courses such as Data Communications or Processors are needed. Mechanics usually enroll online for training. These classes fill up very quickly. ([REDACTED]) - The only class available now that I'm aware of is the 5-week ATC class for newly hired mechanics. Mechanics will sign up or volunteer to attend the class per Supervisors approval. ([REDACTED])
Training	Are we hiring qualified individuals?	<ul style="list-style-type: none"> - The "dirty 30." [Referring to a mass hire of mechanics in 2011-2013 with lower standards for acceptance]. ([REDACTED]) - ATC only requires basic electrical and mechanical knowledge to start as a Helper Mechanic. In my opinion we need motivated workers that are willing to learn and not quit after seeing the train up close at the roadway. ([REDACTED])
Business Practices	Fri-Mon, why is this the "skeleton shift"?	<ul style="list-style-type: none"> - I worked in the aviation business and had Tuesday and Wednesday off for years. So I would eliminate the weekend rule of having one of the days off Sat/Sunday, and give week days off. Then the same number of techs would be here 7 days a week. ([REDACTED]) - Switch PMIs for instance need 5 people (RWIC + 2 techs to work on the switch +1 lookout + 1 panel operator). This PMI cannot be done

Interview Notes

Category	Question	Response (adjustments in brackets for readability)
		<p>because only four (4) techs are scheduled Friday-Mon. ([REDACTED])</p> <ul style="list-style-type: none"> - I personally disagree on this. The weekend shift should not be skeleton because there is no rush hour and more work can be done. It is also safer since the train only passes every 20 mins compare to every 7 mins during weekday rush hour. Also if there's an issue on the track on weekends, not enough staff to cover the stations compare to regular weekdays. ([REDACTED])
<p>Business Practices</p>	<p>How exactly does the pick process work? What are its disadvantages?</p>	<ul style="list-style-type: none"> - Every six months you pick by seniority. The June pick you can pick system wide. The December pick you can only pick within the division you are in. ([REDACTED]) - Knowledge of each tech is different especially the AA's. Every area on the line has it's specific problems and training people on these takes time. ([REDACTED]) - Junior mechanics cannot pick a particular location a little longer in order to master the system out there. They gets bump all over the place, and yes managers face a task of training new techs every picks. ([REDACTED]) - Although this question purports to answer itself, there are advantages to the Pick system as well. Attempting to change it dramatically would be chaotic, to say the least. ([REDACTED]) - The disadvantage of it is rotating the crew per location and getting bump. I had a mechanic that came from South of Virginia and had to report all the way North at Glenmont MD. Also new crew that is not familiar with the line and driving to the stations is a disadvantage. Not knowing where the interlocking and switches of the new track line. Have to check the new pick crews profile if what level of training, certification, tools, calibration of meter/radio due dates. ([REDACTED]) - Lack of commitment and team building. Supervisors can just wait out a bad employee rather than pressing into discipline process. ([REDACTED]) - For me personally, I tend to get the lower experienced techs on my shift pick because of the size of the territory that we have to cover. I feel that my shift pick would be more attractive to more techs if the territory coverage was smaller. I currently have the largest area to cover in all of ATC. Also, some techs don't promote because they don't want to lose their seniority by changes job groups (classes). ([REDACTED])

Interview Notes		
Category	Question	Response (adjustments in brackets for readability)
Track Access	What are the reasons given to ATC mechanics as to why they cannot be granted track access?	- On mids we need GOTRS to do anything. But we are denied rights for various random reasons. Also the night our rights are active we can be bumped or some CM can take precedence so we have to submit them again and wait another 3 weeks. ([REDACTED])
Records Management - Processes	How many PM data sheets do you have to review daily on average? How often are they improperly filled out?	- Yes. Review about 4 or 5 a day. We sign them all. ([REDACTED]) - On average, 3 a week [are improperly filled out]. ([REDACTED])
Records Management - Processes	Do all mechanics utilize the long description field in Maximo when closing out a CM?	- No, not all mechanics utilize the long description field when they "Finish" a CM, however, before I "Complete and Close" the CM I make sure there is a description of work done in the long description. Mechanics cannot "CLOSE" out a CM. ([REDACTED])
Business Processes	What is the benefit of having a 5 man crew as opposed to a 4 man crew?	- One benefit is, if you are performing track circuit verifications at a station where radio communications are not great from the TCR to the wayside (very little range) you can utilize a 5 th mechanic to relay radio messages between the train control room and wayside personnel. If you are working in a "Hot Spot" area, for example a curve. You benefit from having an additional person or persons to serve as advance watchman lookouts as required. If working on a CM and you need a part to complete the job, a 5 th person to go and pick up the parts can be beneficial while the rest of the 4 man crew continues to work the problem. ([REDACTED])



Quality Assurance, Internal Compliance & Oversight

Interview Notes

QICO PROGRAM	ATC Audit – Area Manager Interview		
LOCATION	[REDACTED]	DATE:	3/6/2017
		TIME:	1300-1530

Background Information	
Name(s):	[REDACTED]
Position:	Area Manager
Auditor:	[REDACTED]
	(3/6/2017)

Interview Notes		
Category	Question	Response
Quality of Work	Overview	<ul style="list-style-type: none"> - [REDACTED], ATC Area Manager under [REDACTED] From Shady to Brookland (Part of Red Line). - 1200pm – 1pm, 3/6/2017 ([REDACTED]). [REDACTED], Brookland Station. - Over supervisors at [REDACTED], [REDACTED], [REDACTED], who supervise preventative maintenance work every day/night. - How long you been working at Metro? Too Long. Close to retirement (next year) - Started at B because he passed the exams. Then went to journeyman’s school, worked up to AA within two years. AA-Lead (acting supervisor, and know-it-all for any type of ATC issue). - 48 employees working under him, working day, evening and night shifts (1030-630). - PMs, CMs, Transporting Parts to Telegraph Rd and CTF, Providing support for Track Maintenance, Engineering, etc. Some are weekly, some are monthly, some every two years, etc. - Workload includes: support track, support engineering, PMs, CMs, Transport Parts, and Car Pool maintenance.
Quality of Work	Typical Day	<ul style="list-style-type: none"> - Typical instructor was an AA mechanic. Problems with class effectiveness. - Typical Day: Typical 6am-2pm shift. 5 AM review of PMs/CMs with Midnight Shift Supervisor and - Typical Crew: 4-man crew, RWIC, Lookout, 2 guys to perform the work. If OCC wants another guy to control the panel, you lose another guy. It used to be every employee looking out for their own safety. - “Safety is our biggest issue. A lot of the technicians will not do anything unless they know they are safe.” - Comes in every morning checks what the midnight crew has done and maximo for PMs.

Quality of Work	Obtaining Proper Parts	<ul style="list-style-type: none"> - Cross Bonds / High Current Bonds – have to wait until night work. For example, bobbing circuits from Traction Power Return. The current through the rails should be equal, ideally. When the current is unequal (200 amps or more), the bond will saturate and will stop functioning properly. Ensuring the proper type of connection from impedance bonds to the running rail is key. - Originally Clamps. Good connection - CEMBRE Connection pushed by Engineering for maintenance. But connection quality worse. - Corrugation can create bobbing track circuits too and Loss of Shunt (LOS). And it can develop in new rail within a couple months. - Maintenance-of-Way equipment damaging wayside ATC equipment. - Example: Ballast Car derailling in the tunnel, spilling ballast everywhere. - Investigations: Train Operators running through red signals, occasionally derailling at [REDACTED] ATC has to prove that the lunar signal was on (that in fact it was a red signal). - RTU's going down. They transmit data to OCC for both ATC, Traction Power and Drainage Pumping Stations.
Training	Training	<ul style="list-style-type: none"> - The Pick: Every 3 months (SafeTrack) and every 6 months (regular), employees get to pick WHERE and WHEN they want to work (shift and location). This is done by seniority within each grade. Ironically, this ensures that AA's are well distributed, but employees sometimes choose to stay within their grade. - Journeyman's class is neither scheduled, effective, or provides enough incentive for passing for lower grade ATC technicians.
Other	Other	<ul style="list-style-type: none"> - Central only allowing 5 groups at a time on the roadway. Everybody ends up waiting on the order of hours to get on track. This happens both days and nights (1030 to 0630). Now a PMI that usually takes one day will now take 3 days. - Supervisors put in GOTRS rights. Thinks he has rights secured. Goes to the GOTRS meetings, gets knocked off his PMI schedule. - We do not have enough AAs. This is due to a variety of reasons. Some people don't want the responsibility. Some employees don't want to lose their pick, because separate picks are done for each employee category (AA-H). - No Electronic records, still paper copies being held at Field Offices and Train Control Rooms. No IT support at Field Offices



Quality Assurance, Internal Compliance & Oversight

Interview Notes

QICO PROGRAM	ATC Audit – ATC Shift Supervisor Interview		
LOCATION		DATE:	3/28/2017
		TIME:	1300-1530

Background Information	
Name(s): [REDACTED]	Auditor: [REDACTED] (3/6/2017)
Position: Shift Supervisor (MATS)	

Interview Notes		
Category	Question	Response
Quality of Work	Overview	<ul style="list-style-type: none"> - Officially his title is [REDACTED] - Materials, logistics, asset management (lacking asset management scope) - Need someone who has the ability to make actions, to take decisions, review equipment, interphase with SCES - Augment the existing Asset Management policies, to allow for compliance with existing policy - Track and be accountable - Transient Assets: personal test equipment, radios, serialized key sets (access keys to control) - Concerns about the - Logical interphase between the executive level and the "foot soldiers" - Maintenance Planning should be involved - 4 technicians supporting the team - Supports ATC-Maintenance and ATC-CIT
Quality of Work	How is data entered for the ATC Group?	<ul style="list-style-type: none"> - No Maintenance Planning Group for ATC - Data entry is not dedicated to one role; everyone is doing - No process/documentation flow for the movement of transient equipment - Requests for equipment come through email
Overview	Vital ATC	<ul style="list-style-type: none"> - Materials Acquisition: monitoring Maximo stock portioning, reordering parts, direct interphase with SCES, planning (forecasting); non-stock acquisition of tools/equipment to a special job; inventory vs non-inventory - Replacing old equipment, updating equipment and adding new equipment (i.e. silver line) - Logistics: Asset Management, obsolescence vs in hour manufacturing (i.e. creating the caps on the cable from a weeze bond to somewhere else; configure junction boxes; heated control cases) doesn't have estimates, but could come up with rough estimates for the work - Coordinator/liason - His group configures all junction boxes on track - Would like all ATC equipment to come through MATS but that's not the case

		<ul style="list-style-type: none">- Doesn't have 24/7 access to equipment for maintenance, shift supervisors lock everything up when they leave for the day/night and do not want to keep it open
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Quality Assurance, Internal Compliance & Oversight

Interview Notes

QICO PROGRAM	ATC Audit – Interlocking Preventative Maintenance and Supervisor/Technician Interview				
LOCATION	Rhode Island Metro Station	DATE:	3/15/2017	TIME:	10:00-12:00

Background Information	
<p>Name(s): [REDACTED]</p> <p>Position: [REDACTED] (Supervisor [REDACTED]) & [REDACTED] (AA Technician)</p> <p>Time at WMATA: [REDACTED] (19 years) & [REDACTED] (11 years)</p> <p>Previous Experience: Air Force background with power generators (fixed plant and mobile units)</p>	<p>Responsibility: [REDACTED] (QICO: Infrastructure Assurance)</p> <p>Responsible Area: Rhode Island to Shady Grove</p>

Interview Notes	
Question	Response
Day to Day & Workflow Issues	<ul style="list-style-type: none"> - [REDACTED] had a 6-month training class when he was hired by WMATA. Then moved up from helper to supervisor through his career. - [REDACTED] in a 3-month training program that was divided up into 2 week and 4 week stretches in the classroom and the field. The 3 month class was "1.5 years of information compressed." Learned more in the field than in the classroom. Started as a helper and moved up, working for production and maintenance. - Man Power Issue, stated crew is supposed to have 5 people (1 AA, 2 B/C, and 2 helper), actual is (1AA, 1 BC, and 2 helper). - They work in a high frequency emergency response area ([REDACTED]). ATC gets called for most emergencies. - Parking at Metro Yards is an issue. They have to wait on somebody to leave on most days to find a parking spot, also emergency response parking spots should be implemented at stations downtown. - Coordination between Power and ATC: the POWER department performed a PM at a Train Control Room, changing the wire configuration, which lead to blown fuses and RTU malfunction. ATC was called out to that emergency and it took away from their workflow. Power and ATC need to coordinate better on these efforts. - [REDACTED] stated it takes on average 20 minutes to get track access, and over an hour during an emergency. - Under only two situations do they have immediate track access. During an emergency (switch out of correspondence and loose signal or Loss of Shunt (LOS)).



Quality Assurance, Internal Compliance & Oversight

Interview Notes

QICO PROGRAM	ATC Audit: Interview of ATCM Production Assistant Superintendent		
LOCATION	(Phone Interview)	DATE:	2/28/2017
		TIME:	10:30

Auditee Information	
Name(s): [REDACTED] Position: ATCM Production Assistant Superintendent Time at WMATA: 34 years	Auditor: [REDACTED] (QICO: Infrastructure Assurance) Auditor: [REDACTED]

Interview Notes		
Quality Measure	Question or Subject Matter	Response
Overview	What are your responsibilities?	<ul style="list-style-type: none"> - 34th year and helper. Associate degree in electronics, and have taken extensive ATC classes. 50/50 with work for ATC maintenance and ATC production (CIT) - Various projects: switch retrofits, track circuit cabling, escorting contractors, installing jumpers, bonding joints, installing high current bonds, meggering cables, Engineering Modification Instructions (EMI) - SafeTrack support for transitioning from track 1 to track 2 single tracking events, reinstallation and testing ATC components on track, installing new switches and test.
Quality – Performance of Work	How does parts management work?	<ul style="list-style-type: none"> - Production has a group sole responsibility to manage parts materials and tools (the Materials Control Office). Farrington and Carmen Turner are two production locations for parts. Maintenance has more personnel and field offices all over [the system for parts storage]. - Supervisors at Materials and Inventory Planning (MIPN) order supplies needed for ATCM.
Training	What is the incentive to go for promotion (e.g. AA,A,B)?	<ul style="list-style-type: none"> - It's hard to get people to move up to be a supervisor. Just stay as an AA mechanic, who can make a lot of money on overtime.
Business Process	Where are Engineering Modification Instructions (EMIs) stored?	<ul style="list-style-type: none"> - EMIs go back to engineering for procore records.



Quality Assurance, Internal Compliance & Oversight

Interview Notes

QICO PROGRAM	ATC Audit: Track Circuit Verification PM & Technician Interview				
LOCATION	Shaw [REDACTED] Metro Station	DATE:	3/16/2017	TIME:	10:30

Auditee Information	
Name(s): [REDACTED] Position: Technician (AA) Time at WMATA: 30 years	Auditor: [REDACTED] (QICO: Infrastructure Assurance)

Interview Notes		
Quality Measure	Question or Subject Matter	Response
Overview	Overview	<ul style="list-style-type: none"> - When interviewee came to WMATA's ATC group, he received the 3-month "journeyman" training. He started as a helper and moved up through the ranks. Interviewee's crew currently covers [REDACTED] (Mt Vernon – Ft Totten). - When he was hired, interviewee stated they had better quality personnel back then i.e. Engineers and just plain college graduates, now not so much. - Back in 2010/2011, [the previous COO] hired 100 unqualified personnel with no background in electrical equipment.
Quality – Performance of Work	What personnel do you need for ATC PM's such as Track Circuit Verification?	<ul style="list-style-type: none"> - For Track Circuit Verification, a shunt is installed on the track to simulate a train occupying track. A tech in the Train Control Room verifies the proper relay dropping to confirm that track circuit is working properly. - For the track circuit verification PM, the interviewee prefers a crew of six – "One more guy would be reasonable, but five total would suffice." A crew of six would include 1 RWIC, 1 watchman, 2 workers with the shunt, and 2 in the train control room. The RWIC and Watchman was recently implemented as necessary positions for safety reasons. Two technicians in TCR rooms is helpful due to radio signal issues in TCR rooms; one tech has to stand by the door to communicate with trackside personnel sometimes and write down readings.
Compliance with Standards	What barriers to Track Access does your team face?	<ul style="list-style-type: none"> - There are track access issues, especially at Platforms and Curves. - OCC denies access when walking from station to station. [We] have to sit at various stations for long periods of time in order to move on to the next station.
Records Management	Are parts readily available?	<ul style="list-style-type: none"> - Parts are hard to find (i.e. ground detector, which doesn't get manufactured anymore). There is a hard time obtaining bonds as well also multiple line modems at [REDACTED] yard.
Workflow Issues	How often are you responding to emergencies, instead of performing PMs?	<ul style="list-style-type: none"> - There is a high emergency response rate (e.g. LOS, down track circuit, RTU offline, switch out of correspondence, etc.)

8.5 Appendix E: QICO FIELD INSPECTIONS

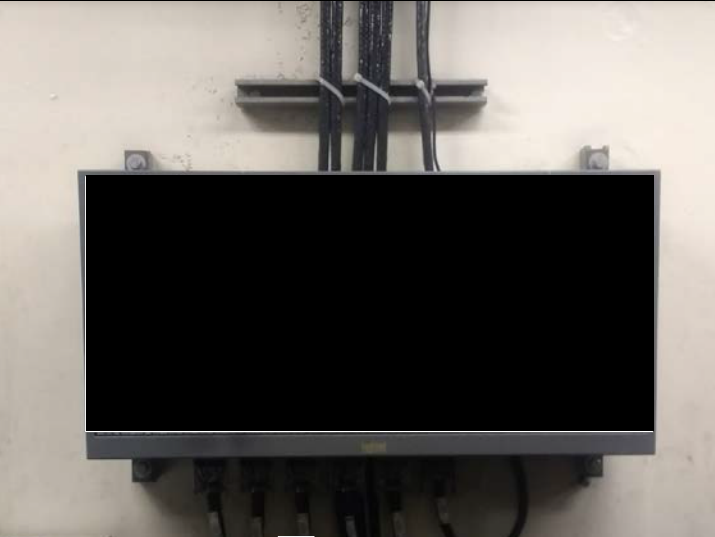


INFRASTRUCTURE ASSURANCE PROGRAM

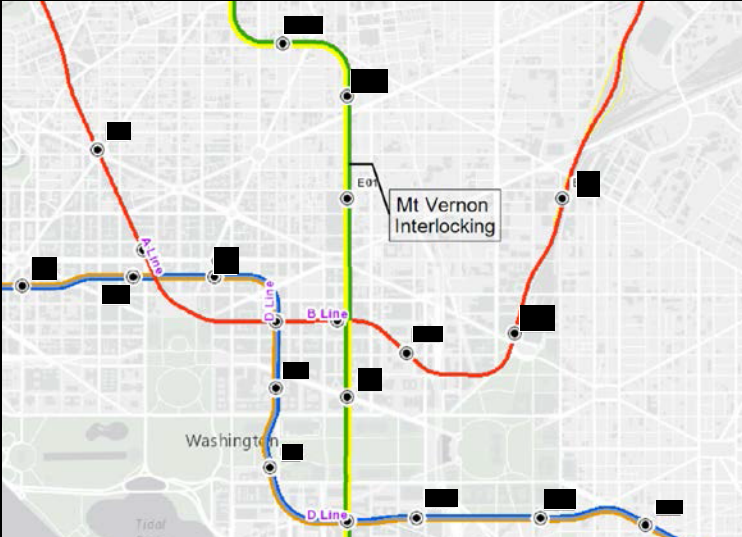
QUALITY ASSURANCE REPORT

QICO FIELD TEAM	██████████	REPORT NO:	N/A
AUDITEE	RAIL:ATCM (Automatic Train Control Maintenance)	LOCATION:	██████████ Mt. Vernon Interlocking
ACTIVITY	Switch Obstruction Test (PM)		
DATE	March 17, 2017 (1000 – 1130)		

EXECUTIVE SUMMARY



Mt Vernon ██████████ Switch Control Panel



Location of the Test

PURPOSE

The infrastructure assurance team for **Quality Assurance, Internal Compliance and Oversight (QICO)** accompanied a **Switch Obstruction Test (PM)** inspection the morning of March 16, 2017 (1000-1130). This was conducted as part of an audit of Automatic Train Control Maintenance (ATCM) which is in turn part of the **2017 QICO System wide Audit**. Performing these audits safeguards the mission success of the Authority by providing effective internal oversight of WMATA’s operational processes and assets. This test verifies that train detection equipment, circuits, and systems are functioning as intended to ensure continuous train detection and safety of train movements, this test is performed quarterly.

SCOPE

Switch obstruction testing was to be completed for the switches in the pocket track north of Mt. Vernon ██████████ (including switches 5A, 5B, 7, 11A, 11B). The switch obstruction test is #1008 in the ATC-1000 Testing and Inspection of ATC Apparatus and Systems.

RESULTS

Five roadway personnel were in position (at the train control room for E01 Mt. Vernon Square) to conduct the testing around 1015am; a safety briefing was conducted fully in accordance with the Roadway Worker Protection Manual. However, ROCC did not grant the team access to take control of the switch control panel, which is required to conduct the scheduled preventative maintenance inspection for the pocket track. ROCC again denied access 10 minutes later, and the PMI was abandoned. Details provided by ROCC were sparse. ATC personnel expressed frustration at their inability to access the track, coupled with the fact that the ██████████ pocket track was being utilized at a **reduced frequency** due to SafeTrack Surge 13 (Braddock Rd to Huntington).



INFRASTRUCTURE ASSURANCE PROGRAM

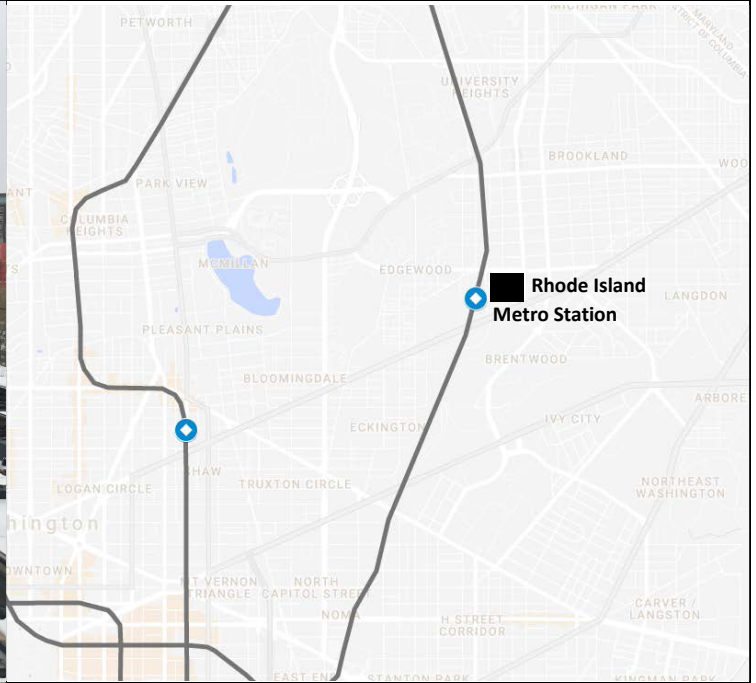
QUALITY ASSURANCE REPORT

QICO FIELD TEAM	[REDACTED]	REPORT NO:	N/A
AUDITEE	RAIL: ATCM (Automatic Train Control Maintenance)	LOCATION:	[REDACTED] (Rhode Island)
ACTIVITY	Interlocking Preventative Maintenance (PM) (3003)		
DATE	March 15, 2017 (1000 – 12:00)		

EXECUTIVE SUMMARY



Rhode Island Interlocking



Rhode Island Metro Station

PURPOSE

The infrastructure assurance team for **Quality Assurance, Internal Compliance and Oversight (QICO)** accompanied a **Interlocking Inspection (3003) (PM)** the morning of March 15, 2017 (1000-1200). This was conducted as part of an audit of Automatic Train Control Maintenance (ATCM) which is in turn part of the **2017 QICO System wide Audit**. Performing these audits safeguards the mission success of the Authority by providing effective internal oversight of WMATA's operational processes and assets. This test verifies that the roadway equipment layouts are intact and in a state of good repair to ensure reliable operation and safety of train movement thru the interlocking. This inspection is performed weekly. See **ATC 3000 Preventative Maintenance and Technical Procedures Manual Inspection 3003** for procedures and prerequisites.

SCOPE

Interlocking Inspection Preventative Maintenance (3003) is focused on verifying that the roadway equipment layouts are intact and to ensure reliable operation and safety of train movement thru the interlocking. Regular inspection and maintenance of the interlocking wayside train control equipment and track work is required to verify configuration and detect any excessive wear, damage, or disarrangement of equipment that may cause unreliable operation, equipment failure, or operational hazard. Observations of certain Interlocking components are noted and checked off on **FORM 3003-Interlocking Inspection Data Sheet**, if there is any need for remedial actions it is noted as well. The ATCM crew was comprised of [REDACTED] (AA mechanic), [REDACTED] (C Mechanic), [REDACTED] (Helper), and [REDACTED] (Helper). The inspection started with a complete safety briefing; Radio Operations Control Center (OCC) granted permission to enter wayside to begin test and remained in communication with Operations Control Center (OCC) throughout the test.

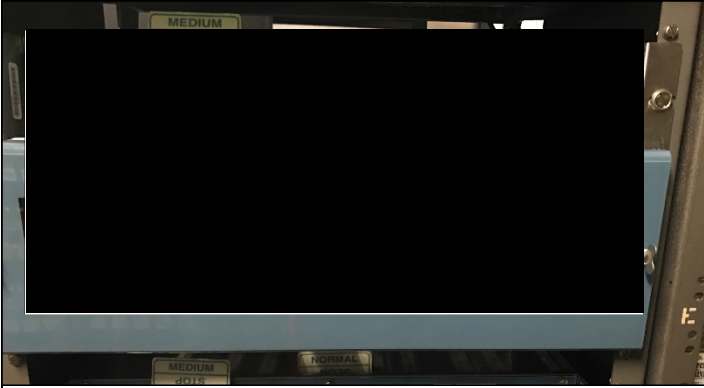
RESULTS

All Interlocking track components were inspected for excessive wear and/or damage. One (1) rail clip was found to be dislodged near switch machine, mechanic knocked it back into its proper position. No further issues were found with Interlocking. Ground was covered with snow, however switch heaters were in good working order and all switch points and rod cribs were free of snow and ice.

OBSERVATIONS

Item Number	Observation
1	Safety briefing very well presented, all necessary information was conveyed to all employees involved. Close clearance (Hot Spots) were called out and clearing areas understood by all. All radios were checked. Extra caution for slippery conditions was relayed to all.
2	Each employee had a very good understanding of his role in the inspection process
3	The Interlocking PM was finished fairly quickly (under 30 min), the maintenance crew then proceeded to spend the rest of their shift (2 hours) on emergency response standby.

ADDITIONAL PHOTOS



Track Circuit Modules w/ Speed Couplers



ATC Mechanic Inspecting Switch Machine Area



Two (2) D Loops & Impedance Bond



US&S M3 Electric Switch Machine

PREPARED BY:	QICO OFFICER	
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APPROVED BY:	QICO MANAGER	
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INFRASTRUCTURE ASSURANCE PROGRAM

QUALITY ASSURANCE REPORT

QICO FIELD TEAM	[REDACTED]	REPORT NO:	N/A
AUDITEE	RAIL: ATCM (Automatic Train Control Maintenance)	LOCATION:	[REDACTED] Shaw-Howard Metro Station
ACTIVITY	Track Circuit Verification Preventative Maintenance (PM) 1012A-1, 1012C, and ATC Wayside inspection (3004)		
DATE	March 16, 2017 (1000 – 1130)		

EXECUTIVE SUMMARY

Ansaldo 800W Audio Frequency Track Circuit Modules
E02 Shaw Metro Station

PURPOSE

The infrastructure assurance team for Quality Assurance, Internal Compliance and Oversight (QICO) accompanied a Track Circuit Shunt Verification and Detection Signal Level Test Preventative Maintenance (PM) inspection the morning of March 16, 2017 (1000-1130). This was conducted as part of an audit of Automatic Train Control Maintenance (ATCM) which is in turn part of the 2017 QICO System wide Audit. Performing these audits safeguards the mission success of the Authority by providing effective internal oversight of WMATA’s operational processes and assets. This test verifies that train detection equipment, circuits, and systems are functioning as intended to ensure continuous train detection and safety of train movements, this test is performed quarterly.

Detection Signal Level Test Preventative Maintenance (1012A-1) is focused on verifying track circuit’s train detection carrier frequency Transmit/Receive signal levels are within tolerance [REDACTED] of the last adjusted values for level and [REDACTED] of nominal for within the frequency limits listed in Table 1012A-1-1. Track Circuit Shunt Verification (1012C) test, verifies that a track circuit relay will drop, or that the vital input indicates track circuit occupied, when a [REDACTED] (i.e. soft-shunt) is installed across the

rails in any part of the track circuit. The ATCM crew was comprised of [REDACTED] (AA Mechanic), [REDACTED] (B Mechanic), [REDACTED] (B Mechanic), [REDACTED] (Helper). The inspection started with a complete safety briefing; Radio Operations Control Center (OCC) granted permission to enter wayside to begin test and remained in communication with Operations Control Center (OCC) throughout the test.

RESULTS

All Track Circuits tested are in compliance with test procedures, and all circuits shunted as intended. All Impedance Bonds were checked for loose or missing hardware and components.

OBSERVATIONS

Item Number	Observation
1	Safety briefing very well presented, all necessary information was conveyed to all employees involved. Close clearance (Hot Spots) were called out and clearing areas understood by all. All radios were checked.
2	Four employees performed this task, all employees were well prepared with proper tools, meters, equipment, and forms to perform this test and inspection. Communication with control center and each other was by radio
3	Each employee had a very good understanding of his role in the test and inspection processes.
4	Track Circuits Tested in Room [REDACTED], E2-46, E2-50R, E2-52, E2-54, E2-58, E2-64R



INFRASTRUCTURE ASSURANCE PROGRAM

QUALITY ASSURANCE REPORT

QICO FIELD TEAM	[REDACTED]	REPORT NO:	N/A
AUDITEE	RAIL: ATCM (Automatic Train Control Maintenance)	LOCATION:	[REDACTED] (Federal Triangle) and [REDACTED] (Smithsonian)
ACTIVITY	Track Circuit Verification Preventative Maintenance (PM) 1012A-1, 1012C, and ATC Wayside inspection (3004)		
DATE	April 19, 2017 (1000 – 1240)		

EXECUTIVE SUMMARY

AF-800W Track Modules in Train Control Room

Federal Triangle & Smithsonian Metro Station

PURPOSE

The infrastructure assurance team for Quality Assurance, Internal Compliance and Oversight (QICO) accompanied a Track Circuit Shunt Verification (1012C) and Detection Signal Level Test Preventative Maintenance (1012A-1) (PM) and ATC Wayside Inspections (3004) the morning of April 19, 2017 (1000-1240). This was conducted as part of an audit of Automatic Train Control Maintenance (ATCM) which is in turn part of the 2017 QICO System wide Audit. Performing these audits safeguards the mission success of the Authority by providing effective internal oversight of WMATA’s operational processes and assets. This test verifies that train detection equipment, circuits, and systems are functioning as intended to ensure continuous train detection and safety of train movements, and inspections of wayside equipment and connections. This test and inspection is performed quarterly. See ATC 1000 Instructions for Testing and Inspection of ATC Apparatus and Systems test 1012A-1 for procedures and prerequisites.

SCOPE

Detection Signal Level Test Preventative Maintenance (1012A-1) is focused on verifying track circuit's train detection carrier frequency Transmit/Receive signal levels are within tolerance: $\pm 10\%$ of the last adjusted values for level and $\pm 0.5\%$ of nominal for within the frequency limits listed in Table 1012A-1-1. **Track Circuit Shunt Verification (1012C)** test, verifies that a track circuit relay will drop, or that the vital input indicates track circuit occupied, when a [REDACTED] shunt (i.e. soft-shunt) is installed across the rails in any part of the track circuit. **ATC Wayside Inspections, 3004** is done in conjunction with this test. The ATCM crew was comprised of [REDACTED] (AA Level Mechanic), [REDACTED] (B Level Mechanic), [REDACTED] (C Level Mechanic), [REDACTED] (B Level Mechanic), [REDACTED] (C Level Mechanic). The inspection started with a complete safety briefing; Radio Operations Control Center (OCC) granted permission to enter wayside to begin test and remained in communication with Operations Control Center (OCC) throughout the test.

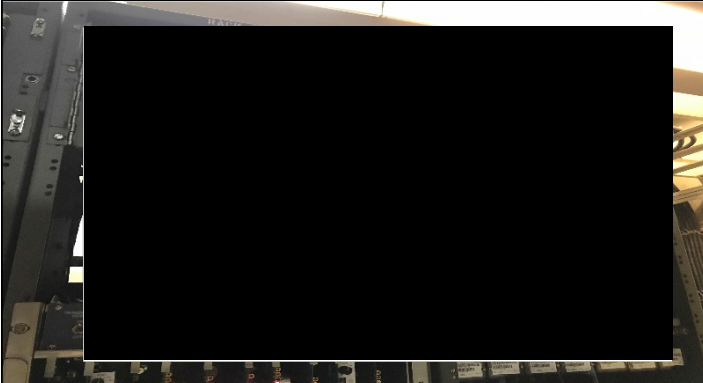
RESULTS

All Track Circuits tested are in compliance with test procedures, and all circuits shunted as intended. All Impedance Bonds were checked for loose or missing hardware and components. Three (3) rail jumpers were found to be missing or defective and noted on Inspection Report for corrective action.

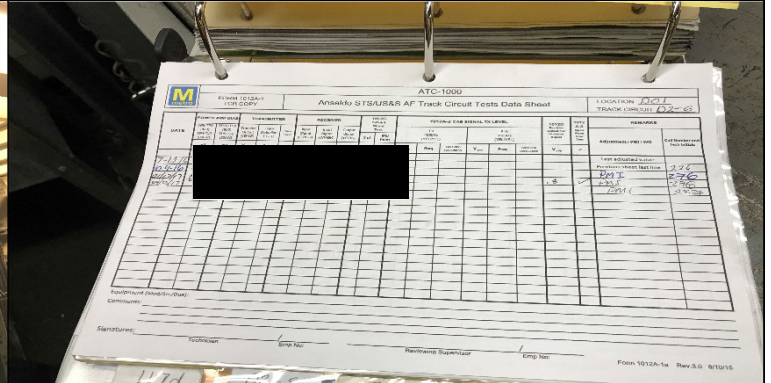
OBSERVATIONS

Item Number	Observation
1	Safety briefing very well presented, all necessary information was conveyed to all employees involved. Close clearance (Hot Spots) were called out and clearing areas understood by all. All radios were checked.
2	Five employees were needed to perform this task, all employees were well prepared with proper tools, meters, equipment, and forms to perform this test and inspection. Communication with control center and each other was by radio
3	Each employee had a very good understanding of his role in the test and inspection processes, potential defects were noted on the Inspection (3004) form.
4	Track Circuits Tested in Room D01, D2-6, D2-8, D2-10, D2-12, D2-13, D2-P(Platform), D2-16R
5	Track Circuits Tested in Room [REDACTED], D2-19, D2-24, 3BT, 1BT (Interlocking) D2-26, D2-30, D2-32, D2-34, D2-34P(Platform), D2-36R, D2-40, D2-42, D2-45, D2-46
6	Technicians Performed Wayside Inspection as per ATC 3000 (3004), Checked impedance bonds loose or missing hardware and loose connections, tightened all connections at Impedance Bonds, checked rail jumpers, three rail jumpers ("C" bonds) were found defective or missing and noted on Inspection Form for a work order to be opened.

ADDITIONAL PHOTOS



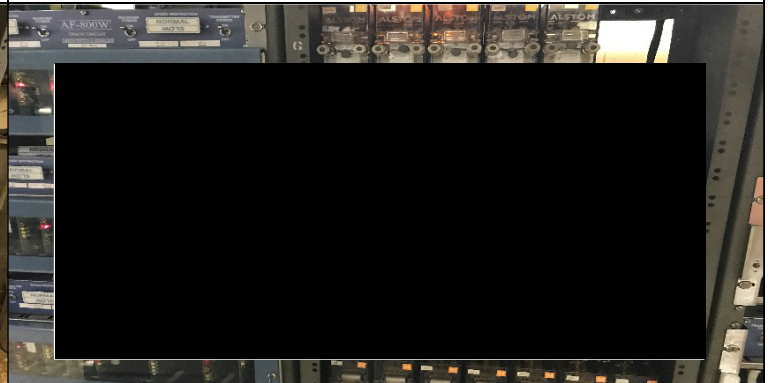
Platform Track Circuit Modules



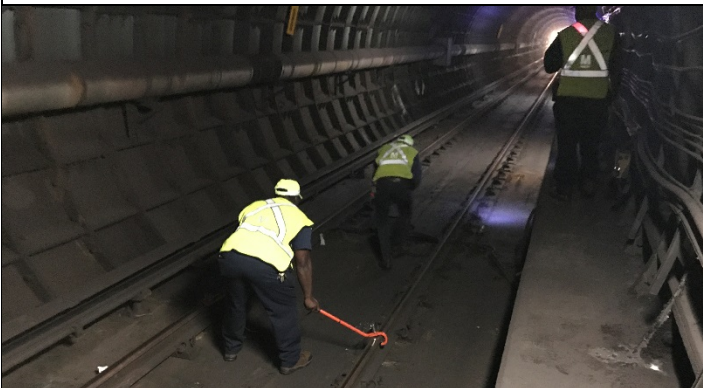
Track circuit Test Form



Ansaldo (US&S) 800W Audio Frequency Track Circuit Module



Alstom Track Repeater Relays



Shunt Being Applied to Rails



Impedance Bond

PREPARED BY:

QICO OFFICER

APPROVED BY:

QICO MANAGER



INFRASTRUCTURE ASSURANCE PROGRAM

QUALITY ASSURANCE REPORT

QICO FIELD TEAM	[REDACTED]	REPORT NO:	N/A
AUDITEE	RAIL: ATCM (Automatic Train Control Maintenance)	LOCATION:	[REDACTED] Clarendon Station
ACTIVITY	Switch Obstruction Preventative Maintenance (PM)		
DATE	April 4, 2017 (1000 – 1130)		

EXECUTIVE SUMMARY



M3 Switch Machine (Mechanic Checking Point opening)

Clarendon Metro Station

PURPOSE

The infrastructure assurance team for **Quality Assurance, Internal Compliance and Oversight (QICO)** accompanied a **Switch Obstruction Test (1008) (PM)** the morning of April 4, 2017 (1000-1130) This was conducted as part of an audit of Automatic Train Control Maintenance (ATCM) which is in turn part of the **2017 QICO System wide Audit**. Performing these audits safeguards the mission success of the Authority by providing effective internal oversight of WMATA’s operational processes and assets. This test verifies that switch position monitoring equipment, circuits, and systems are functioning as intended to ensure safe passage of trains over moveable points of a track switch. Continuous train detection and safety of train movements, and inspections of wayside equipment and connections. This test and inspection is performed monthly. See **ATC 1000 Instructions for Testing and Inspection of ATC Apparatus and Systems test 1008** for procedures and prerequisites

SCOPE

To verify that the switch will indicate an “out of correspondence” status, when the associated switch points are open one quarter (¼) inch or more. If the switch has a mechanical locking mechanism, these must not engage during the obstruction test. The ATCM crew was comprised of [REDACTED] (AA Mechanic), [REDACTED] (B Mechanic), [REDACTED] (B mechanic) [REDACTED] (C Mechanic), [REDACTED] (Helper). The inspection started with a complete safety briefing; Radio Operations Control

Center (OCC) granted permission to enter wayside to begin test and remained in communication with Operations Control Center (OCC) throughout the test.

RESULTS

Switch layout was found to be in be in good working condition. No adjustments were needed or any loose, damaged or missing hardware. Switch machine securely mounted and properly drained and area is free of debris. Switch rods have adequate clearance. For GRS 55E or US&S M-3 switch machine, the switch and lock movement does not mechanically lock when the point has a ¼" obstruction or more. For all switch machines, the switch indicates out of correspondence status when the point opens ¼" or more.

OBSERVATIONS

Item Number	Observation
1	Safety briefing very well presented, all necessary information was conveyed to all employees involved. Close clearance (Hot Spots) were called out and clearing areas understood by all. All radios were checked.
2	Five employees were needed to perform this task, all employees were well prepared with proper tools, meters, equipment, and forms to perform this test and inspection. Communication with control center and each other was by radio
3	Each employee had a very good understanding of his role in the test and inspection processes. Employees made efficient use of limited time between trains to perform tasks. All trash and debris was cleared from around rods and machines.
4	Motor brushes were inspected and found to be acceptable. Point opening measurements were taken and recorded on the Test Form (1008) all contacts were checked for tension and all hardware and wire connections checked and tightened if found to be loose.
5	A ¼ inch obstruction gage was placed between the stock rail and switch point 6 inches from the point (second foot bolt), indication contacts were open and LCP indicated switch out of correspondence and all correspondence relays de-energized.

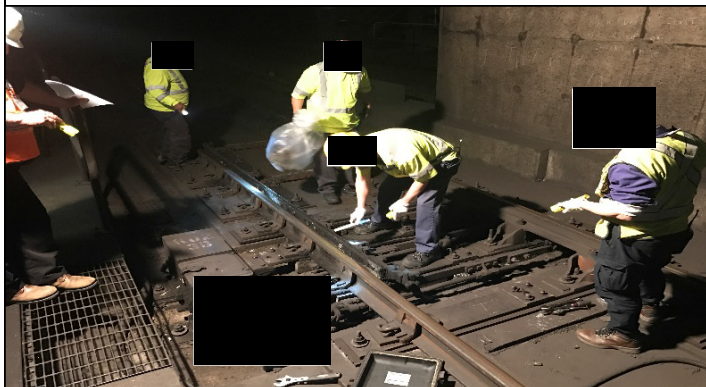
ADDITIONAL PHOTOS



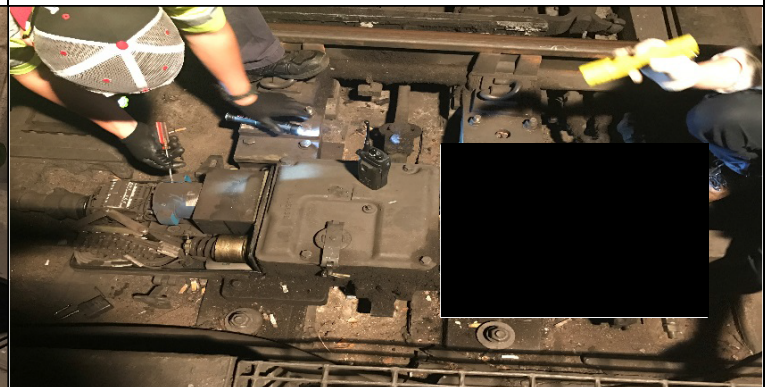
Employee Removing Debris From Around Switch Machine



M3 Switch Machine with Cover Removed from Indication Box



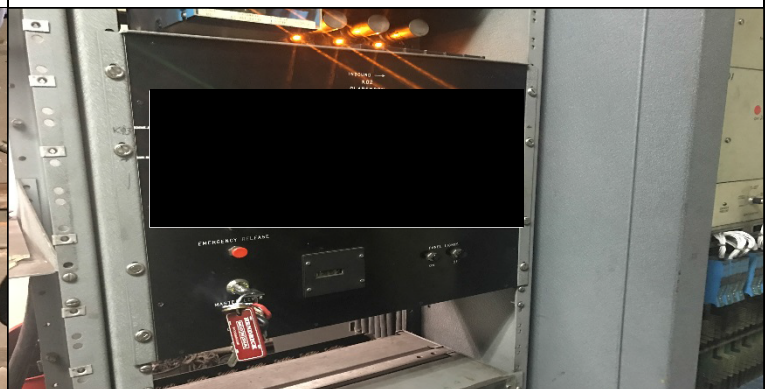
ATC Mechanic Taking Point Opening Measurements



ATC Mechanic Removing Motor Brushes for Inspection



1/4 Inch Obstruction Gauge in Reverse Point



Local Control Panel (LCP)

PREPARED BY:	QICO OFFICER	
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APPROVED BY:	QICO MANAGER	
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INFRASTRUCTURE ASSURANCE PROGRAM

QUALITY ASSURANCE REPORT

QICO FIELD TEAM	[REDACTED]	REPORT NO:	N/A
AUDITEE	RAIL: ATCM (Automatic Train Control Maintenance)	LOCATION:	Carmen Turner Facility (CTF)
ACTIVITY	ATC Training Lab Tour & Interview with Director of Technical Skills Maintenance Training (TSMT)		
DATE	April 20, 2017 (1330 – 1430)		

OBSERVATIONS



Figure 1: ATC Laboratory at CTF



Figure 2: Local Control Panels (LCP)

PURPOSE

The infrastructure assurance team for **Quality Assurance, Internal Compliance and Oversight (QICO)** toured the ATC training facility at Carmen Turner Facility (CTF) alongside the Director of Technical Skills Maintenance Training (TSMT) the afternoon of April 20, 2017 (1330-1430). This was conducted as part of an audit of Automatic Train Control Maintenance (ATCM) which is in turn part of the **2017 QICO System Wide Audit**. Performing these audits safeguards the mission success of the Authority by providing effective internal oversight of WMATA’s operational processes and assets.

SCOPE

The ATC Training Facility Tour was focused on observing training classrooms, laboratory equipment, and laboratory setup. Additionally, an interview was conducted with the Director of TSMT in order to obtain a complete understanding of what training courses are available for ATC personnel.

OBSERVATIONS

Item Number	Observation
1	Equipment in ATC Laboratory Classroom #1 are outdated but was reassured that the equipment is still sufficient in teaching personnel what to expect in the field
2	
3	
4	

ADDITIONAL PHOTOS



Figure 3: ATC Lab Classroom #1

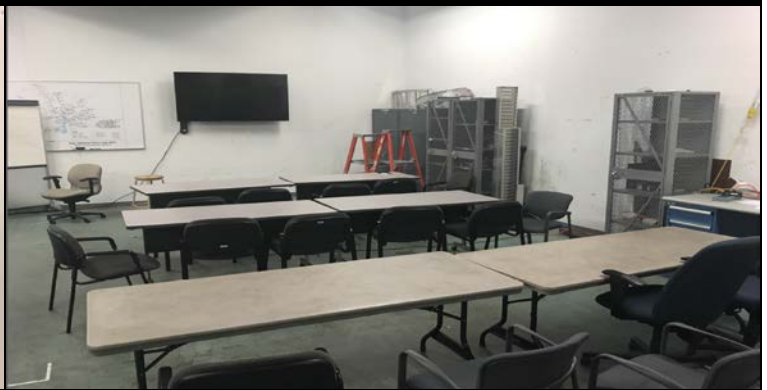


Figure 4: ATC Lab Classroom #2

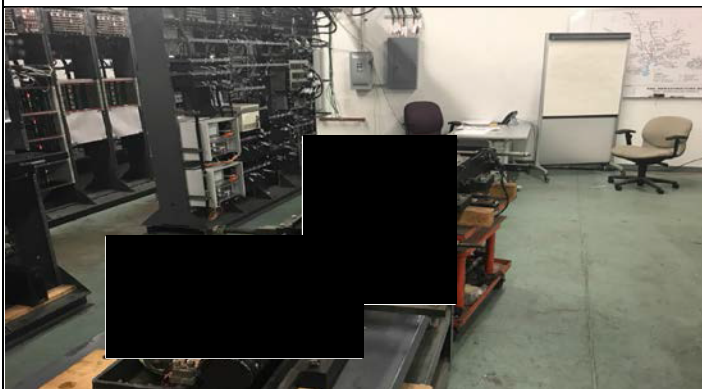


Figure 5: Wayside Switch Machines in ATC Lab #2



Figure 6: Programmable Logic Controllers (PLC) in ATC Lab #2

PREPARED BY:	QICO OFFICER	
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APPROVED BY:	QICO MANAGER	
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8.6 APPENDIX F: APPLICATION OF REGULATORY CAPs

Measure	Required Actions	QICO Review During Review
Regulatory Findings – FTA	<p>TOC-ATC-15-002:</p> <p><i>The ATC Branch and SAMS must conduct a full inventory of ATC tools in order to scrub Maximo and its tracking list of all tools no longer being used. The ATC Branch or SAMS must provide a revised Maximo inventory list with obsolete tools removed and regained calibration compliance. Also, the ATC Branch and SAMS must develop a documented tool distribution control method so that new equipment/tools are not issued until old ones are returned, and the person receiving the old equipment removes it from the inventory and maintenance cycle in Maximo.</i></p> <p>Status as of 4/27/2017: Open</p>	<ul style="list-style-type: none"> - Due date 08/31/17 - No observations occurred during the course of this review.
Regulatory Findings - FTA	<p>TOC-ATC-15-003</p> <p><i>WMATA's ATC Branch must meet the PM frequency requirements of ATC-1000 and ATC-3000 standards for the identified PMs. WMATA's ATC Branch must provide a printout or screenshots showing the tests added to Maximo as well as evidence of appropriate completion as scheduled.</i></p> <p>Status as of 4/27/2017: UNDER REVIEW</p>	<ul style="list-style-type: none"> - Initial WMATA's CAP closure request was submitted on 07/22/16. However, on 04/07/17 WMATA revised the submission and added the following requested docs: <ul style="list-style-type: none"> - Engineering Bulletin EIB-17-0001 updates the 1011B PM. - (Screenshots) ATC Preventive Maintenance Inspections Tests 1012A. - QICO review of Preventative Maintenance (PM) compliance Reports showed not all PMs are being completed on time and closed out in Maximo.

8.6 APPENDIX F: APPLICATION OF REGULATORY CAPs

Measure	Required Actions	QICO Review During Review
Regulatory Findings - FTA	<p>TOC-ATC-15-004</p> <p><i>WMATA's ATC Branch must ensure any electronic copies of the 3003 Interlocking Inspection Data Sheet are replaced with blank copies. WMATA's ATC Branch must provide its updated policy as well as a signed memorandum validating that all remaining pre-filled Data Sheets have been destroyed.</i></p> <p><i>Status as of 4/27/2017: UNDER REVIEW</i></p>	<ul style="list-style-type: none"> - Submitted a CAP Closure request 06/30/16 - QICO observed a blank copy of the 3003 Interlocking Inspection Data Sheet being used by ATC mechanics during Preventative Maintenance Assessment on 3/15/17 for B04 Rhode Island Metro Station Interlocking Inspection.
Regulatory Findings - FTA	<p>TOC-ATC-15-005</p> <p>WMATA's ATC Branch must enforce a clear method to ensure that personnel turn in copies of their Data Sheets to both Train Control Rooms and Field Offices. The ATC Branch must work with WMATA's Safety and Quality functions to schedule routine audits of Field Office paperwork and Corrective Maintenance work orders.</p> <p>Status as of 4/27/2017: OPEN/PAST DUE</p>	<ul style="list-style-type: none"> - Revised estimated date 04/14/17. - QICO observed ATC mechanics during E02 Track Circuit Verification Preventative Maintenance on 3/16/2017 submit a copy of Data Sheets to the Train Control Room and Field Office.
Regulatory Findings - FTA	<p>TOC-ATC-15-006</p> <p><i>WMATA's ATC management must develop a procedure and conduct quality control spot checks of Supervisors' work to ensure they are fully completing their duties (such as reviewing Data Sheets and adding defects to new work orders).</i></p> <p><i>Status as of 4/27/2017: OPEN/PAST DUE</i></p>	<ul style="list-style-type: none"> - Revised estimated date: 05/04/17 - QICO observed during course of the review that quality control spot checks are not being completed and/or documented per Finding F-ATC-17-05.

8.6 APPENDIX F: APPLICATION OF REGULATORY CAPs

Measure	Required Actions	QICO Review During Review
Regulatory Findings – FTA	<p>TOC-ATC-15-008</p> <p><i>WMATA must add a Maximo Start Center option to see all past due inspections, and the ATC Branch must regularly assess this information for maintenance scheduling as it currently does on a monthly basis.</i></p> <p><i>Status as of 4/27/2017: CLOSED</i></p>	<ul style="list-style-type: none"> - FTA closed CAP on January 19, 2017 - During the review, QICO observed ATC management utilizing the Start Center option in Maximo to highlight duplicate work orders.
Regulatory Findings – FTA	<p>TOC-ATC-15-010</p> <p><i>WMATA must add this new inspection to Maximo for regular scheduling, along with any additional inspections created or increased in frequency as a result of the Return to ATO report.</i></p> <p><i>Status as of 4/27/2017: CLOSED</i></p>	<ul style="list-style-type: none"> - FTA closed CAP on January 13, 2017. - No observations occurred during the course of this review.
Regulatory Findings – FTA	<p>TOC-ATC-15-011</p> <p><i>WMATA's ATC Branch must establish requirement in its Maintenance Control Policy (MCP) for quality control spot checks and resulting documentation to be completed by each Supervisor. (Note: This is different than the separate finding (TOC-ATC- 15-006) that prescribes spot checks of Supervisor work; this finding relates to Supervisor spot checks of technician work.)</i></p> <p><i>Status as of 4/27/2017: OPEN/PAST DUE</i></p>	<ul style="list-style-type: none"> - Revised estimated date: 05/04/17. - QICO observed during the course of the review that quality control spot checks are not being completed and documented per Finding F-ATC-17-05.

8.6 APPENDIX F: APPLICATION OF REGULATORY CAPs

Measure	Required Actions	QICO Review During Review
<p>Regulatory Findings – FTA</p>	<p>TOC-ATC-15-012</p> <p><i>WMATA's ATC Branch must add pictures to part numbers in Maximo, consistently provide training it has developed regarding part numbers, and take other steps to ensure part numbers are easily accessible for maintainers and technicians.</i></p> <p><i>Status as of 4/27/2017: OPEN /PAST DUE</i></p>	<ul style="list-style-type: none"> - Revised estimated date: 07/27/17 - No observations occurred during the course of this review.
<p>Regulatory Findings – FTA</p>	<p>FTA-16-4-T12</p> <p><i>Cadweld C-bonds must be identified and replaced with huck bolted cables in the webs of the rail as specified in WMATA's design and construction standards.</i></p> <p><i>Status as of 4/27/2017: Open</i></p>	<ul style="list-style-type: none"> - Due date: December 2017. - No observations occurred during the course of this review.

9 REFERENCE DOCUMENTS

9.1 Reference 1: JOB DESCRIPTIONS

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

CLASS SPECIFICATION

Superintendent, Automatic Train Control (ATC), TA-24

DEFINITION OF CLASS:

This is professional administrative, technical and managerial ATC Systems Maintenance work of a complex nature. Employee in this class is responsible for overseeing, planning, organizing, coordinating and directing the Authority's ATC operating and maintenance systems, establishing effective and efficient ATC operating and safety procedures, and coordinating support facilities operating procedures. The employee's performance will be measured on the efficient and effective management of the Authority's automatic train control systems in terms of quality of maintenance and operations. Employee has extensive latitude for independent judgment and action within established guideline. Employee reports to the Assistant General Superintendent, Systems Maintenance and assists the Assistant General Superintendent and General Superintendent in accomplishing the ATC objectives of the Department.

EXAMPLES OF DUTIES:

Develops and manages the effective implementation and administration of the installation, testing, pre-operation systems check-out, and the operating maintenance and management of the ATC System.

Establishes the overall maintenance plans and procedures for the ATC System in coordination with the Authority's Maintenance Planning System, insures safety rules and regulations are followed; develops appropriate ATC maintenance manpower plans, insuring the effective utilization of all resources.

Authorizes the timely purchase of ATC maintenance materials, and oversees the distribution and storage functions in coordination with the maintenance information planing system.

Analyzes annual plans and long range forecasts of ATC activities relative to engineering design changes, installations, maintenance, and operation, insuring the effective coordination of budgetary needs.

Evaluates causes of failures in support equipment/systems to insure the initiation of positive measures to improve equipment performance. Reviews operating and maintenance records and develops additional and more effective preventive maintenance procedures.

Evaluates complaints and grievances with employees or their representatives and attempts to effectively resolve them in accordance with established employee relations policies.

Performs periodic performance appraisals of subordinate employees.

Prepares periodic and other reports as required.

Performs related duties as required.

- 2 -

KNOWLEDGE, SKILLS AND ABILITIES:

Thorough knowledge of signal and train control systems as they relate to track and vehicles, and of current railroad and rapid transit signal maintenance procedures and test equipment, with the ability to apply them to the Authority's needs.

Extensive knowledge of materials and supplies utilized in rail signal maintenance including failure rate/life expectancy.

Knowledge of the requirement of signal standards set forth in the Federal Railroad Administration's Rules and Regulations.

Knowledge of, or the ability to rapidly attain knowledge of the Authority's rules and regulations, and related collective bargaining agreements.

Ability to effectively supervise and evaluate subordinates and operations of the ATC function.

Ability to establish and maintain effective working relationships with those individuals and organizations with whom interface exists.

Ability to effectively troubleshoot complex ATC technical problems.

Ability to prepare concise reports and to communicate effectively both orally and in writing.

Ability to effectively manage and coordinate complex projects.

Ability to acquire and maintain a current knowledge of transit systems of other properties to enhance effectiveness of the Authority's operations.

MINIMUM QUALIFICATIONS AND EXPERIENCE:

Graduation from an accredited college or university with a Bachelor's Degree in Electrical or Mechanical Engineering or a related field with extensive experience in construction, inspection and maintenance of railway signaling systems and extensive progressively responsible supervisory, administrative, and managerial experience in related areas applicable to a high speed heavy tonnage railroad or rapid transit system involving CTC, NX or UR interlocking control or cab signaling and the responsibilities associated with rail operations. Or an equivalent combination of education and experience.

LICENSE:


Possession of, or the ability to readily acquire a valid District of Columbia, Maryland or Virginia Motor Vehicle Operator's Permit.

MEDICAL GROUP:

Ability to complete satisfactorily the medical examination for this class.

Approvals:

DEPT/OFFICE:  DATE: 9-6-91

PERS/COMP:  DATE: 9-9-91

LABR: _____ DATE: _____

Class Established:

8112

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

CLASS SPECIFICATION

Assistant Superintendent, Automatic Train Control, TS-07

DEFINITION OF CLASS:

This is administrative, technical, maintenance and supervisory work of a difficult nature. Employee in this class is responsible for assisting in organizing, coordinating and directing the Authority's Automatic Train Control (ATC) operating and maintenance plan, establishment of the ATC operating and safety procedures, as well as coordination of support facilities operating procedures. Employee has latitude for independent judgment and action within established guidelines. Employee is supervised by the Superintendent, Automatic Train Control.

EXAMPLES OF DUTIES:

Directs the Construction, Inspection, Test and Material Control activities of the Section.

Assists in supervising the installation, testing, pre-operation systems check-out and the operating maintenance and management of the ATC system.

Assists in planning and programming the purchase of ATC maintenance materials, and the distribution and storage functions in coordination with the maintenance information plan.

Assists in establishing and overseeing the ATC Training Program correlating it with the RAIL technical Training Plan.

Assists in preparation of annual plans and long range forecasts of ATC activities relative to engineering design changes, installation and operation, including appropriate budgetary needs.

Conducts frequent field inspections to observe operations, maintenance, training and troubleshooting procedures. Inspects equipment rooms to ensure a high state of cleanliness exists and that storage and preservation are maintained. Submits written report on conditions found, observations of training, cleanliness, storage and personnel performance.

Periodically performs the duties of the Assistant Superintendent, Maintenance Operation Center.

Reviews operating and maintenance records and develops additional preventive maintenance procedures.

Assists in evaluating complaints and grievances with supervisors, employees or their representatives and attempts resolution in accordance with sound employee-relations practices.

Works variable hours and shifts.

Performs other duties as required.

KNOWLEDGE, SKILLS AND ABILITIES:

Thorough knowledge of signal and train control systems as they relate to track and vehicles.

Working knowledge of railroad or rapid transit maintenance procedures for organizing system and section maintenance forces.

Broad knowledge of current railroad and rapid transit signal and train control maintenance and test equipment and how this equipment can be used to the best advantage for maintenance of a rapid transit system.

Knowledge of the requirement of materials and supplies utilized in rail signal maintenance including failure rate/life expectancy.

Knowledge of or the ability to rapidly attain knowledge of the Authority's Rules and Regulations and Labor Management procedures.

Ability to effectively work with individuals in both internal and external agencies where interface is required.

Ability to effectively supervise, evaluate and track subordinates.

Ability to communicate effectively, both orally and in writing.

MINIMUM QUALIFICATIONS AND EXPERIENCE:

Graduation from an accredited college or university with a Bachelor's Degree in Electrical or Mechanical Engineering or a related field. Extensive experience in supervision, operation maintenance and training in railway signaling and train control systems.

Or, an equivalent combination of education and experience.

LICENSE:

Possess a valid Maryland, Virginia or District of Columbia motor vehicle license from jurisdiction of residence.

MEDICAL GROUP:

Ability to complete satisfactorily the medical examination for this class.

Approvals:

DEPT/OFFICE: [Signature] Date: 0238

PERS/COMP: [Signature] Date: 0608

LABR: _____ Date: _____

Class established:

CLASS SPECIFICATION

Supervisor, Automatic Train Control (ATC), TS-6

DEFINITION OF CLASS:

This is a technical rail maintenance and supervisory work. Employee in this class is responsible for the supervision of assigned personnel in the most efficient execution of Automatic Train Control maintenance tasks, safety and training programs and other related tasks in conformance with the ATC operating and maintenance plan. Employee has latitude for independent judgment and action within established guidelines. Employee is supervised by a designated supervisor.

EXAMPLES OF DUTIES:

Supervises assigned maintenance personnel in the installation, testing pre-operation systems check-out and operational maintenance of the ATC System. Makes assignments to personnel by workload priority, giving instructions in proper work methods/techniques following up on progress/satisfactory completion of work.

Assists in the development, implementation and administration of on the job training programs; provides input for the formulation and review of the Job Educational Training Standards. Trains, evaluates and (re) certifies employees in accordance with the Employee Certification, Training and Promotional Program. Documents and maintains employee consolidated training records. May attend (in)formal training programs to maintain level of expertise. Recommends personnel actions. Discusses and resolves complaints and grievances with employees in accordance with collective bargaining agreements and personnel policies.

Supervises the technical maintenance of the ATC System advising/directing the application of required technical standards.

Assists in the development of the maintenance plan and procedures for the ATC System; in the planning and development of ATC maintenance manpower requirements; and in the procurement, storage and distribution of ATC maintenance materials.

Interprets Authority policies within areas of responsibility and enforces safety regulations.

Works variable shifts.

Acts for Superintendent, ATC in his/her absence, as directed.

Performs related duties as required.

KNOWLEDGE, SKILLS AND ABILITIES:

Knowledge of railroad or rapid transit system regulations.

Knowledge of signal and train control systems as they tie in to track and vehicles.

Knowledge of railroad or rapid transit maintenance procedures.

Knowledge of current railroad and rapid transit signal maintenance and test equipment and how this equipment can be used to the best advantage for maintenance of a rapid transit system.

Knowledge of the requirements of signal standards set forth in the Federal Railroad Administration (FRA) and Association of American Railroads (AAR).

Broad knowledge of materials and supplies utilized in rail signal maintenance including failure rate/life expectancy.

Knowledge of, or the ability to attain rapidly knowledge of the Rules and Regulations and Labor Management procedures of the Authority.

Ability to comprehend and to interpret technical manuals, schematics and manufacturers' drawings.

Ability to train and to supervise subordinates.

Ability to communicate effectively orally and in writing.

Ability to establish and to maintain successful working relationships with co-workers and the public.

Ability to work variable shifts.

MINIMUM QUALIFICATIONS AND EXPERIENCE:

Graduation from an accredited college or university with a Bachelor's Degree in Electrical or Mechanical Engineering or other related fields with experience in construction, inspection or maintenance of railway signaling system with supervisory experience preferably in related areas applicable to railroad or rapid transit systems. This experience should be in a UR or NX interlocking control or cab signaling and the responsibilities associated with rail operations.

Or, an equivalent combination of education and experience.

MEDICAL GROUP:

Ability to complete satisfactorily the medical examination for this class.

Ability to distinguish basic colors for wiring and safety identification.

Ability to perform strenuous physical tasks, i.e., lifting of objects weighing 25 to 50 pounds.

Approved by: 

Date: Mar 10, 1983

Revised: 12/10/82

CLASS SPECIFICATION

Shift Supervisor, Automatic Train Control (ATC), TS-5

DEFINITION OF CLASS:

This is technical and supervisory Automatic Train Control maintenance work. Employee in this class is responsible for supervising the installation, testing and maintenance of the ATC system on the shift to which assigned. Employee has latitude for independent judgment and action within established guidelines. Employee is supervised by a designated supervisor.

EXAMPLES OF DUTIES:

Supervises on a shift basis, assigned maintenance personnel performing maintenance inspection, testing and repair of assigned Train Control equipment. Makes assignments to personnel by workload priority, giving instructions in proper work methods/techniques following up on progress/satisfactory completion of work.

Assists in the development, implementation and administration of on the job training programs; provides input for the formulation and review of the Job Educational Training Standards. Trains, evaluates and (re) certifies employees in accordance with the Employee Certification, Training and Promotional Program. Documents and maintains employee consolidated training records. May attend (in)formal training programs to maintain level of expertise. Recommends personnel actions. Discusses and resolves complaints and grievances with employees in accordance with collective bargaining agreements and personnel policies.

Supervises the implementation of the maintenance plan and procedures for the ATC system.

Requisitions materials, parts and tools and insures their proper use and care.

Interprets Authority policy within areas of responsibility and enforces safety regulations.

Works variable shifts.

Prepares written and other reports as required.

May operate an Authority vehicle between work area.

Performs related duties as required.

KNOWLEDGE, SKILLS AND ABILITIES:

Extensive knowledge of signal systems and nomenclature and the principles of signal layout and track circuit theory. Thorough knowledge of the safety rules regarding lookout protection while working on the line and the rules governing the protection of traffic.

Ability to supervise, evaluate and train personnel in subordinate classifications.

Ability to recognize that the integrity of vital circuitry must be maintained particularly during testing/troubleshooting/equipment repair.

Knowledge of, or the ability to attain rapidly knowledge of the Rules and Regulations, ATC operations and maintenance procedures and general safety rules of the Authority. Some knowledge of first-aid procedures desirable.

Ability to read, use and interpret schematics, wiring diagrams, operational manuals, manufacturers' maintenance instructions, rule books, etc.

Ability to work variable hours.

Ability to communicate effectively orally and in writing. Ability to establish and to maintain effective working relationships with co-workers and the public.

MINIMUM QUALIFICATIONS AND EXPERIENCE:

Graduation from high school or possession of a high school equivalency certificate with satisfactory completion of an acceptable electronic/electro-mechanical course. Some college training in Electrical Engineering or a related field is preferred. Extensive experience in both electro-mechanical train control maintenance and in the maintenance of complex digital circulating or related fields is required. Supervisory experience in train control or conventional railroad maintenance is desirable.

Or, an equivalent combination of education and experience.

LICENSE:


Possession of, or the ability to obtain rapidly a District of Columbia, Maryland or Virginia motor vehicle operator's license issued from state of residence.

MEDICAL GROUP:

Ability to complete satisfactorily the medical examination for this class.

Ability to distinguish basic colors for wiring and safety identification.

Ability to perform strenuous physical tasks, i.e., lifting of objects weighing 25 to 50 pounds.

Approved by: 

Date: Mar 10, 1983

CLASS SPECIFICATION

Mechanic AA (ATC Technician)

DEFINITION OF CLASS:

This is technical electronic/electro-mechanical Automatic Train Control (ATC) maintenance and repair work of a difficult and complex nature. Employee in this class is responsible for performing highly skilled maintenance/repair/testing/troubleshooting work on ATC equipment. Employee has latitude for independent judgment and action within established guidelines. Employee's work is supervised by the Supervisor, ATC.

EXAMPLES OF DUTIES:

Have knowledge of and ability to perform all duties of Mechanic A (ATC Repairer).

Performs major repairs, inspection, adjustments, testing, cleaning, lubrication and proper maintenance on assigned ATC equipment in accordance with wiring diagrams, schematics, operations manuals and manufacturers' maintenance instructions. Performs modifications on assigned equipment based on pre-engineered technical data. May fabricate prototype test units to test sub-assemblies within the systems. Performs ATC type renovation/installation work as required.

Observes ATC system components and devices in operation to detect potential failures and locates causes of malfunction. Responds to ATC malfunctions, instituting repairs/replacements as necessary. Uses electronic test equipment and other specialized tools as required.

Completes documentation for installation, maintenance and modification of ATC equipment.

Provides technical assistance to lower classified personnel in their work assignments. Participates in training programs as required.

Complies with Safety Rules, Operating Book of Rules and first-aid procedures.

May work variable hours.

Performs related duties as required.

MINIMUM QUALIFICATIONS AND EXPERIENCE:

Graduation from high school or possession of a high school equivalency certificate, satisfactory completion of an acceptable electronic/electro-mechanical course and progressively responsible experience in electro-mechanical train control work associated with rapid rail transit, conventional railroad or related systems is required. Extensive experience in the maintenance/repair of complex digital circuitry or related fields is required. An equivalent combination of education and experience may be acceptable.

KNOWLEDGE, SKILLS AND ABILITIES: (Cont'd)

Ability to located, diagnose, repair, install, replace or modify ATC components/systems. Ability to read, interpret and use schematics, wiring diagrams, operations manuals, manufacturers' maintenance instructions, rule books, etc. Ability to recognize that the integrity of vital circuits must be maintained particularly during testing/troubleshooting equipment repair.

Ability to use efficiently the various types of ATC test equipment and related specialized tools. Ability to fabricate proto-type of test equipment. Ability to compile and maintain reports.

Ability to participate in training programs and to assist other individuals in their work assignments. Ability to work variable hours. Ability to establish and to maintain successful working relationships with co-workers and the public.

MINIMUM QUALIFICATIONS AND EXPERIENCE:

Graduation from high school or possession of a high school equivalency certificate with satisfactory completion of an acceptable electronic/electro-mechanical course. Progressively responsible experience in electro-mechanical train control work associated with rapid rail transit, conventional railroad or related systems is required. Extensive experience in the maintenance/repair of complex digital circuitry or related fields is required.

Or, an equivalent combination of education and experience.

LICENSE:

Possession of, or the ability to obtain a District of Columbia, Maryland or Virginia motor vehicle operator's license issued from state of residence.

MEDICAL:

Ability to complete satisfactorily the medical examination for this class.

Ability to distinguish basic colors for wire and safety identification.

Ability to perform strenuous physical tasks, i.e., frequent lifting of objects weighing up to 50 pounds and occasionally to 75 pounds.

Approved by: 

Date: Mar 10, 1983

Revised: 12/10/82

Refer to the current Union Contract for the current Progression Rates for this position.

CLASS SPECIFICATION

Mechanic A (ATC)
 Technician

DEFINITION OF CLASS:

This is technical electronic/electro-mechanical Automatic Train Control (ATC) maintenance and repair work. Employee in this class is responsible for performing skilled maintenance, repair and troubleshooting work on ATC equipment. Employee has some latitude for independent judgment and action within established guidelines. Employee is supervised by Supervisor, ATC.

EXAMPLES OF DUTIES:

Performs routine, preventive and unscheduled inspections and repairs, required adjustments, testing, cleaning, lubrication and proper maintenance on assigned ATC equipment in accordance with TCR Book of Plans, wiring diagrams, schematics, operations manuals, regulatory codes, and manufacturers' maintenance instructions. Performs ATC type renovation/installation work as assigned. Responds to ATC malfunctions, analyzes assigned technical problems, and completes repair/replacement work as necessary. Utilizes and maintains electronic test equipment and other specialized tools associated with job assignment.

Completes operational, equipment failure, safety and other reports as required.

Attends assigned On-the-job and formal training classes. Provides technical assistance to subordinate personnel.

Complies with Safety Rules, Operating Book of Rules, and first-aid procedures.

May work variable hours. May operate an Authority vehicle.

Performs related duties as required.

KNOWLEDGE, SKILLS AND ABILITIES:

Have knowledge of and have performed satisfactory all the duties of mechanic B for six months and demonstrated ability to perform at the Mechanic A level.

Knowledge of signal system and nomenclature and the principles of signal layout and track circuit theory. Thorough knowledge of the safety rules regarding lookout protection while working on the line and the rules governing the protection of traffic.

Knowledge of, or the ability to attain knowledge of the rules and regulations, ATC operations and maintenance procedures and general safety rules of the Authority. Some knowledge of first-aid procedures and cardiopulmonary resuscitation.

Ability to perform tasks outlined in the established Job Educational Training Standards (JETS) or a related proficiency evaluation system to working level specified. Ability to pass Mechanic A promotional eligibility requirements.

Ability to recognize that the integrity of vital circuitry must be maintained, particularly during testing/troubleshooting/equipment repair.

KNOWLEDGE, SKILLS AND ABILITIES: (Cont'd)

Ability to read, use and interpret schematics, wiring diagrams, operational manuals, manufacturers' maintenance instructions, rule books, etc.; and to locate, diagnose, repair and install ATC components/systems effectively. Ability to use the various types of ATC test equipment and related specialized tools.

Ability to communicate effectively orally and in writing. Ability and willingness to assist lower classified personnel in their work assignments. Ability to establish and to maintain successful working relationships with co-workers and the public. Ability to work variable hours.

MINIMUM QUALIFICATIONS AND EXPERIENCE:

Graduation from high school, or possession of a high school equivalency certificate with satisfactory completion of an acceptable electronic/electro-mechanical course. Considerable experience in electro-mechanical train control work associated with rapid rail transit, conventional railroad or related systems, and in the maintenance/repair of complex digital circuitry or related fields is required.

Or, an equivalent combination of education and experience.

LICENSE:

Possession of, or the ability to obtain a District of Columbia, Maryland or Virginia motor vehicle operator's license issued from state of residence.

MEDICAL:

Ability to complete satisfactorily the medical examination for this class.

Ability to distinguish basic colors for wire and safety identification.

Ability to perform strenuous physical tasks, i.e. frequent lifting of objects weighing up to 50 pounds and occasionally to 75 pounds.

Approved by: 

Date: Mar 10, 1983

Revised: 12/10/82

**Refer to the current Union Contract for the
current Progression Rates for this position.**

CLASS SPECIFICATION

Mechanic B (ATC)
Technician

DEFINITION OF CLASS:

This is technical electronic/electro-mechanical Automatic Train Control (ATC) maintenance and repair work. Employee in this class performs specifically assigned, semi-skilled maintenance repair, testing and troubleshooting work on ATC equipment. Employee has limited latitude for independent judgment and action within established guidelines. Employee is supervised by the Supervisor, ATC.

EXAMPLES OF DUTIES:

Performs routine, preventive and unscheduled repairs, inspections, cleaning, testing, lubrication, adjustments and proper maintenance on assigned equipment, in accordance with TCR Book of Plans, wiring diagrams, schematics, operations manuals, regulatory codes, and manufactures' maintenance instructions. Assists in assigned ATC type renovation/installation work. Responds to ATC malfunctions, completing repairs as assigned. Uses and maintains as directed specific types of ATC electronic test equipment and other specialized tools associated with job assignment.

Completes assigned operational, equipment failure, safety and other reports as required. Attends assigned on-the-job and formal training classes; may provide technical assistance to subordinate personnel in their work assignments.

Complies with Safety Rules, Operating Book of Rules and first-aid procedures.

May work variable hours. May operate an Authority vehicle.

Performs related duties as required.

KNOWLEDGE, SKILLS AND ABILITIES:

Have knowledge of and have performed satisfactory all the duties of Mechanic Helper for six months and demonstrated ability to perform at the Mechanic B level. Ability to use common and specialized tools and test equipment.

Knowledge of, or the ability to attain knowledge of the safety rules regarding look-out protection while working on the line and the rules governing the protection of traffic. Some knowledge of first-aid procedures and cardiopulmonary resuscitation.

Ability to perform tasks outlined in the Job Education Training Standards or a related proficiency evaluation system to the working level specified. Ability to pass Mechanic B promotional eligibility requirements.

Ability to use and interpret schematics, wiring diagrams, operations manuals, manufacturers' maintenance instructions, Operating Book of Rules, etc. and to comprehend the operations and maintenance of the Authority's ATC system.

Ability to satisfactorily analyze and correct assigned technical problems.

KNOWLEDGE, SKILLS AND ABILITIES: (Cont'd)

Ability to work variable hours. Ability to establish and to maintain successful working relationships with co-workers and the public. Ability to communicate effectively orally and in writing.

MINIMUM QUALIFICATIONS AND EXPERIENCE:

Graduation from high school or possession of a high school equivalency certificate with satisfactory completion of an acceptable electronic/electro-mechanical course. Some previous acceptable electro-mechanical train control or control systems work is required. Some working experience in the maintenance/repair of complex digital circuitry or related fields is desirable.

Or, an equivalent combination of education and experience.

LICENSE:

Possession of, or the ability to obtain a District of Columbia, Maryland or Virginia motor vehicle operator's license issued from state of residence.

MEDICAL:

Ability to complete satisfactorily the medical examination for this class.

Ability to distinguish basic colors for wire and safety identification.

Ability to perform strenuous physical tasks, i.e., frequent lifting of objects weighing up to 50 pounds and occasionally to 75 pounds.

Approved by: _____

Date: _____

[Handwritten signature]
[Redacted signature]
Mar 10, 1983

Revised: 12/10/82

Refer to the current Union Contract for the current Progression Rates for this position.

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

CLASS SPECIFICATION

Mechanic C (ATC)
 Technician

DEFINITION OF CLASS:

This is technical electronic/electro-mechanical Automatic Train Control (ATC) maintenance and repair work. Employee in this class performs specifically assigned, routine to moderately skilled maintenance repair, testing, and troubleshooting work on ATC equipment. Employee has limited latitude for independent judgment and action within established guidelines. Employee is supervised by the Supervisor, ATC.

EXAMPLES OF DUTIES:

Performs routine, preventive and unscheduled repairs, inspections, cleaning, testing, lubrication, adjustments and proper maintenance within capability of skill level on assigned equipment in accordance with TCR Book of Plans, wiring diagrams, schematics, operations manuals, regulatory codes, and manufactures' maintenance instructions.

Assists higher level Mechanics in the performance of more difficult and complex tasks.

Assists in assigned ATC type renovation/installation work.

Responds to ATC malfunctions and completes repairs of a routine to moderately skilled nature.

Uses and maintains, as directed, specific types of ATC electronic test equipment and other specialized tools associated with job assignment.

Completes assigned operational, equipment failure, safety, and other reports as required.

Attends assigned on-the-job and formal training classes.

May provide technical assistance to subordinate personnel in their work assignments.

Complies with Safety Rules, Operating Book of Rules, and first-aid procedures.

May operate an Authority vehicle.

May work variable hours.

Performs related duties as required.

-2-

KNOWLEDGE, SKILLS AND ABILITIES:

Have knowledge of and have performed satisfactory all the duties of Mechanic Helper for at least one year and demonstrated ability to perform at the Mechanic C (ATC Repairer) level.

Knowledge of, or the ability to attain knowledge of, the safety rules regarding look-out protection while working on the line and the rules governing the protection of traffic.

Some knowledge of first-aid procedures and cardiopulmonary resuscitation.

Ability to pass Mechanic C promotional eligibility requirements.

Ability to comprehend the operations and maintenance of the Authority's ATC System.

Ability to use and interpret schematics, wiring diagrams, operations manuals, manufacturers' maintenance inspections, Operating Book of Rules, etc.

Ability to utilize common and specialized tools and test equipment.

Ability to satisfactorily analyze and correct assigned routine to moderately difficult technical problems.

Ability to communicate effectively orally and in writing.

Ability to establish and to maintain successful working relationships with co-workers and the public.

Ability to work variable hours.

MINIMUM QUALIFICATIONS AND EXPERIENCE:

Graduation from high school or possession of high school equivalency certificate with satisfactory completion of an acceptable electronic/electro-mechanical course is required. Some electro-mechanical train control or control systems experience is also required. Some experience in the maintenance/repair of complex digital circuitry or related fields is desirable.

Or, an equivalent combination of education and experience.

LICENSE:

Possession of, or the ability to rapidly obtain, a District of Columbia, Maryland, or Virginia motor vehicle operator's permit issued from the jurisdiction of residence.


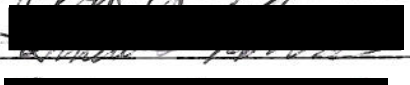

MEDICAL GROUP:

Ability to complete satisfactorily the medical examination for this class.

Ability to distinguish basic colors for wire and safety identification.

Ability to perform strenuous physical tasks including frequent lifting of objects weighing up to 50 pounds and occasionally to 75 pounds.

Approvals:

DEPT/OFFICE:		DATE: <u>2/20/91</u>
PERS/COMP:		DATE: <u>3/22/91</u>
LABR:		DATE: <u>3/20/91</u>

Class Established: 01/08/91



Refer to the current Union Contract for the current Progression Rates for this position.

Code No.: 4661
ELEC PWRHV : 5051
ELE MNTN & TST: 5059
ELEC BNCH : 5062
EL-MECH : 5073
ATC : 5111
GEN COM I/R : 5200
AFCS : 5226

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

JOB DESCRIPTION

POSITION: Mechanic Helper, L689
DEPT/OFFICE: RAIL/SMNT
REPORTS TO: Supervisor of Unit Assigned

DATE: 12/3/98

REVIEWED:
RAIL: [redacted] 12-3-98
HRMP: [redacted] 11-20-98
LABR: [redacted] 11/27/98

POSITION SUMMARY:

This is entry level maintenance work. Employee in this class is responsible for locating minor malfunctions and performing routine maintenance tasks on electronic, electrical, electro-mechanical and mechanical equipment which requires the performance of repetitive operations in prescribed sequence using designated applicable diagrams, manufacturer's specifications, equipment manuals and appropriate regulatory codes. Employee performs assignments within specified instructions detailing results expected, time limits and acceptable quality in a shop/field environment. Employee will work in one of the designated maintenance areas. Employee has limited latitude for independent judgment and action within established guidelines. Employee is supervised by the Supervisor of the unit to which assigned.

DUTIES:

Works in one of the Metrorail maintenance areas to include, but not limited to, Automatic Fare Collection (AFC), Automatic Train Control (ATC), Communications, Computers, Power, Precision Measuring Equipment, Rail, etc. Follows prescribed procedures, performs routine diagnostic disassembly, repair and re-assembly of electronic, electrical, electro-mechanical, mechanical components and equipment in a shop and/or field environment.

Uses precision measuring equipment such as meggers and ohmmeters to test for defective wiring and connections; micrometers to check for excessive wear on bushings, bearings, and gears; oscilloscopes and analyzers to troubleshoot, align, adjust, and calibrate circuits; and other instruments as required under close direction and supervision.

Performs general maintenance such as oiling, cleaning, greasing and making minor

Code No.: 4661
ELEC PWRHV : 5051
ELE MNTN & TST: 5059
ELEC BNCH : 5062
EL-MECH : 5073
ATC : 5111
GEN COM I/R : 5200
AFCS : 5226

adjustments on assigned equipment and components, e.g., switch machines and breakers.

Obtains parts and special tools from the storeroom as required. Cleans tools prior to returning to storeroom.

Applies paint, decals, etc., to assemblies and components as required.

Operates equipment and authorized power tools under supervision.

Operates an Authority vehicle as required.

Maintains cleanliness of work areas.

Attends on-the-job and formal training classes.

Works variable days, shifts and hours as required.

Performs related duties as required.

KNOWLEDGE, SKILLS, AND ABILITIES:

Knowledge of, or ability to attain knowledge of appropriate Authority policy and regulations, maintenance rules and regulations and related safety rules.

Ability to perform tasks outlined in the established Job Educational Training Standard (JETS) or a related proficiency evaluation system to the working level specified and to be certified within one year from date of employment.

Ability to use basic tools and precision measuring equipment effectively, such as meters, oscilloscopes, etc. and to interpret readings from such equipment in repairing defects.

Ability to use manual skill, dexterity, and to apply basic knowledge of electrical/electronic principles in completing assigned repairs.

Ability to work with and to understand and follow oral and written instructions.

Ability to work variable days, shifts and hours and at different locations throughout variable weather conditions.

Code No.: 4661
ELEC PWRHV : 5051
ELE MNTN & TST: 5059
ELEC BNCH : 5062
EL-MECH : 5073
ATC : 5111
GEN COM I/R : 5200
AFCS : 5226

Ability to communicate effectively.

Ability to establish and to maintain effective working relationships with co-workers and the public.

Demonstrated skill or certification in soldering required where necessary.

MINIMUM QUALIFICATIONS AND EXPERIENCE:

Graduation from high school or possession of a high school equivalency certificate and satisfactory completion of an acceptable vocational school and/or training course in basic electronics and electro-mechanics. Some electronics, electro-mechanical experience to include maintenance of digital and analog circuitry.

Candidate's continued employment will be dependent upon a favorable official police background investigation.

LICENSE:

Possession of a valid District of Columbia, Maryland or Virginia motor vehicle operator's permit issued from jurisdiction of residence.

Possession of FCC General Radio Telephone License is desirable.

MEDICAL GROUP:

Ability to satisfactorily complete the medical examination for this job. The employee must be able to perform the essential functions of this job either with or without reasonable accommodations.

Ability to distinguish basic colors for wire and safety identification.

Ability to perform strenuous physical tasks, i.e., frequent lifting of objects weighing up to 50 pounds and occasionally to 75 pounds.

FLSA NON-EXEMPT

Refer to the current **Union Contract** for the current **Progression Rates** for this position.

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
POSITION DESCRIPTION

SPECIAL PROJECT MANAGER, LS-11
DEPT/OFFICE: TIES/SMNT

DATE: 12-4-14

FLSA: EXEMPT
ROLE: 03

REVIEWED: [REDACTED]
TIES: [REDACTED]
HRCB: [REDACTED]

REPORTS TO: Communications Branch Superintendent

SUMMARY:

This is technical, analytical and special project coordination support management work of a complex nature involving special remediation of ongoing communication equipment performance. The incumbent acts as a liaison with all groups within the communication branch and other departments related to special projects and equipment performance. This work primarily involves the evaluation of new systems but will also relate to improvements in existing systems as well. Incumbent analyzes, develops, and coordinates, defines project scope and implements special projects and programs; plans, estimates, coordinates, directs and evaluates maintenance and repair effectiveness. This position has considerable latitude for independent judgment and action within established guidelines. The role entails planning projects; defining project scopes and budgets and ensuring that time lines are defined and adhered to. This position oversees one or multiple projects at once and needs to be a good strategist. Incumbent's performance will be measured on the effectiveness and efficiency of his/her management of technical projects.

MAJOR DUTIES:

Supervises and coordinates the effective implementation of OPRS Systems Equipment Capital Program. Coordinates the rehabilitation of the various systems equipment such as: Communications (Radio, Data Transmission, CCTV, PA, Fire Alarm and Intrusion, Intercom, PIDs, KID, CNG and Veeder Root Systems) for Metrorail and Metrobus.

Plans, develops, coordinates, and provides direction for the assembly and execution of the comprehensive annual SMNT/Communication Equipment Capital Improvement Programs and works closely with CENI Program Management Office to effectively accomplish project requirements and ensure conformance to established cost, schedule and technical performance objectives.

Manages and supervises staff of technical and supervisory personnel and evaluates their performance.

Develops project cost estimates and schedules. Oversees the timely development of technical specifications for Life Cycle system replacement of existing system.

Develops detailed work plans and schedules for manpower, materials, and equipment for each Systems Improvement Project.

Manages program coordination activities to include such tools as computerized project management tracking and reporting system, database design and project management to capture project procurements and related information including budget, expenditures, program materials, force account labor, tools and components, delivery schedules, specifications, vendor/supplier and manufacturer information, weekly and monthly project status reporting.

Oversees program performance and ensures expeditious handling of procurement actions through the approval process. Ascertaines impending problems and conditions which may cause program delays and provides administrative assistance to solve procurement related issues, including budgetary and funding matters, sole source procurements, alternative suppliers, specifications and manufacturer discrepancies, material shipping timetables and delivery schedules.

Serves as liaison and supply project program information to managers and engineering staff, OMBS, PROC, and other affected Authority offices.

Responsible and accountable for developing and submitting a realistic and reasonable project budget and for issuing appropriate progress reports as required to record the project's advancements or delays. The report shall include a register of completed tasks, all payments issued and any problems causing delays, redirection of focus or that impacts project delivery timeline or strategy. A progress report will be provided to OMBS as well as the program's front office (ELT member) as required.

Responsible for cost allocation to appropriate projects and for the timely and accurate review and approval of applicable invoices.

The above duties and responsibilities are not intended to limit specific duties and responsibilities of this position. They are not intended to limit in any way the right of supervisors to assign, direct and control the work of employees under their supervision.

KNOWLEDGE, SKILLS, AND ABILITIES:

Thorough knowledge of principles and practices of project and program management, budgeting methods, procurement, and inventory asset methodologies. Comprehensive and diversified experience in analysis of technical, contractual and legal documentation. Thorough knowledge of OPRS Systems and peripheral equipment.

Ability to relate requirements to system solutions quickly. Ability to supervise, train, and evaluate subordinate staff in compliance with applicable Authority personnel and labor relations policies, procedures, regulations, and agreements.

Comprehensive knowledge in use of personal computer systems, operations, research and systems analysis methods and techniques, local area networks, as well as mainframe computer experience.

Thorough technical knowledge of Communication Systems and related peripheral equipment.

Ability to identify and understand major, critical equipment items that would impact the Improvement Program.

Ability to effectively interface with a variety of internal and external organizations for the purposes of accomplishing project goals.

Sustains all requirements necessary to effectively monitor and implement Capital Programs.

Ability to communicate effectively at all levels of the organization, both orally and in writing.

MINIMUM QUALIFICATIONS:

Graduation from an accredited college or university with a Bachelor's Degree in engineering or related field. Minimum four (4) years of experience in transit operations research, maintenance, project management, or analytical disciplines.

Or, an equivalent combination of post-high school education and a minimum of eight (8) years of experience in transit operations research, maintenance, project management, or analytical disciplines.

MEDICAL GROUP:

Ability to satisfactorily complete the medical examination for this position, if required. The incumbent must be able to perform the essential functions of this position either with or without reasonable accommodations.

9.2 Reference 2: PREVENTATIVE MAINTENANCE DATA SHEETS



ATC-3000

Form 3004 – ATC Wayside Inspection Data Sheet


Location: C15

Date: 11 / 16 / 16

Step	Inspections	✓	Observations	Remedial Actions if Any
1.2	Bridging receiver pin bonds, wires, box	✓		
1.3	Signs: "S", "TB", "ATC Start", "ATC Stop"	✓		
1.4	Ballast dressed below rail base	✓		
1.5	Rail free of corrugation, vegetation debris, corrosion	✓		
2.1	Layout complete, free of damage	✓		
2.2	Impedance secure, cable connectors tight	✓		
2.3	MCM cabling, J-bar, T-bar, and side lead condition	✓		
2.4	Transmission loop layout and long wire loop condition	✓		
2.5	Junction box condition	✓		
2.6	Clamp/bolted lug condition	✓		
3.1	ATO Markers securely mounted	✓		
3.2	ATO Marker housings not cracked or damaged	✓		
4.1	Junction Boxes—mounting hardware in good condition.	✓		
4.2	Junction boxes not damaged or severely rusted	✓		
4.3	Junction boxes have suitable locking mechanisms	✓		

Remarks:


Signatures






Technician Emp No: Reviewing Supervisor Emp No:

wo#13113008

	ATC-3000	
	Form 3002A – Train Control Room Weekly Inspection Data Sheet	
	Location: <u>C15</u>	Date: <u>11/16/16</u>

Step	Inspections	✓	Observations	Remedial Actions if Any
1.1	TCR Locks, Telephones functional	✓		
1.2	TCR HVAC functional	✓		
1.3	Room Lighting, all lamps OK	✓	2 out of 12 Bad	
1.4	Absence of Smoke, odor, etc	✓		
1.5	Absence of Water, moisture	✓		
1.6	Absence of HazMat	✓		
2.1	Indication Lamps	✓		
2.2	Power Supplies	✓		
2.3	Transfer Panel	✓		
2.4	Absence of Circuit Power Failure	✓		
2.5	Module Covers	✓		
2.6	Absence of Audible/Visible Alarms	✓		
3.1	Empty Waste/Debris	✓		
3.3	Racks Clean of dust, foreign matter	✓		
4.1	BOP/ Logbook complete up-to-date	✓		
4.2	All Reference Materials present	✓		
4.3	Test Equipment Inventory Secured	✓		
4.4	Non-rotating items lists checked	MA		
5.1	Fire Extinguisher/suppression indication	✓		
5.2	Computer and Peripherals well arranged	✓		

Remarks: _____

Signatures _____
 Technician _____
 Reviewing Supervisor _____



C15

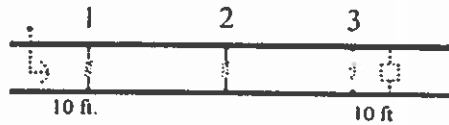
Place a (✓) in each column with successful test

Track Circuit		Verification Shunts				Technicians	
Name	Type	1	2	3	4		
[Redacted]							

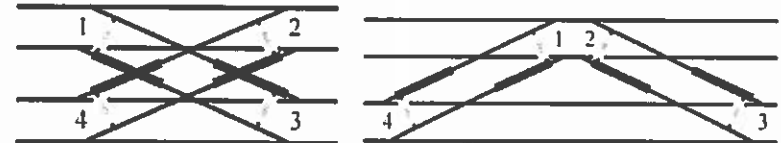
Audio Frequency Track Circuit (AFTC)



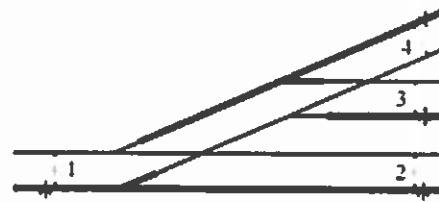
AFTC Interlocking



Power Frequency Track Circuit (ACTC)



ACTC Yard



Series Track Circuit



Remarks:

Signatures:

[Redacted Signature]

Technician

[Redacted Emp No.]

Emp No.

[Redacted Signature]

Reviewing Supervisor

[Redacted Emp No.]

Emp No.

① 13014731
 ② 13074558
 ③ 12981909



ATC-1000

FORM 1012A-1
 FIELD OFFICE COPY

Ansaldo STS/US&S AF Track Circuit Tests Data Sheet

LOCATION [REDACTED]
 TEST DATE 11-1-16

① ② ③

TRACK CIRCUIT	POWER AMP BIAS		TRANSMITTER			RECEIVER			1012C 3-Point Shunt Test		1012A-2 CAB SIGNAL TX LEVEL					1012D Receiver Output For Unextend Signal	1012 A-6 Open Bond Line Test	REMARKS Adjustment / PMI / WO	
	TP9-TP9 (800) TP4-TJ2 (800W)	TP10-TP6 (800) TP5-TJ2 (800W)	Transmit Output (YE/YE)	Track Detection F1-F8	Power Level	Input Signal (GR/GR)	Input Signal (WH/BK)	Output Signal (YE/BK)	3 pt	Mid Point	F9 4550Hz (YEL/YEL)		F10 5525Hz (YEL/YEL)						
	mV	mV	V _{pp}	Freq	SW3	V _{pp}	V _{pp}	V _{pp}	✓	V _{pp}	V _{pp}	Freq	SW1-800 SW2-800W	V _{pp}	Freq	SW2-800 SW4-800W	V _{pp}		✓
C2-629	[REDACTED]																		
-623																			
622																			
-3BT																			
-1BT																			
-617																			
-613																			
-609																			
-607																			

Test Equipment (Mod/Ser/Due): _____

Comments: _____ (11-1-16)
 _____ (11-16-16)

Signatures: _____
 Technician Emp No: _____

 Reviewing Supervisor Emp No: _____

9.3 Reference 3: SHIFT TURNOVER COMMUNICATION

ATCM/FACP/ATC-CIT WORK ASSIGNMENT REPORT

Dept. Supt: [REDACTED] - 8/31/2017 - FARRINGTON F/O [REDACTED]

Date: 4/20/2017
 Region: CITPSS **Special Project Manager:** [REDACTED] Contact Nos: Office No [REDACTED] and Cell Nos [REDACTED]

AM/MID Shift: [REDACTED] Location - CTF [REDACTED] Contact Nos: Office no. [REDACTED] and Cell nos. [REDACTED] & Emergency No [REDACTED]

CITPSS Supervisor & Lead Personnel

Name	Ass. Days	Call #	Truck #	Group	RWP LV EXPIRE	CIP No	Charge Code	Reporting Location	CHECK IN	CHECK OUT	BRIEF DESCRIPTION OF PROJECT (S)
[REDACTED] v)	M-F	[REDACTED]	23047	1	LV. 4 - 5/31/17	[REDACTED]	[REDACTED]	3421-A	500	1400	[REDACTED] Flashing Lunar
[REDACTED]	S-T	[REDACTED]	23046	2	LV. 4 - 3/31/17	[REDACTED]	[REDACTED]	3421-A	600	1800	Surge #14 Safe Track
[REDACTED]	T-S	[REDACTED]	23054	3	LV. 4 - 6/30/17	[REDACTED]	[REDACTED]	FARR	600	1800	Surge #14 Safe Track
[REDACTED]	M-F	[REDACTED]	23052	4	LV. 4 - 3/31/17	[REDACTED]	[REDACTED]	FARR	600	1400	[REDACTED] Flashing Lunar
[REDACTED]	M-F	[REDACTED]	23048	5	LV. 4 - 4/30/17	[REDACTED]	[REDACTED]	FARR	2200	1000	MCO/Inventory/Safe Track Support
[REDACTED]	T-S	[REDACTED]	23024	6	LV.4 - 10/30/17	[REDACTED]	[REDACTED]	3421-A/E99 SWS	600	1400	Switch Shop Duties

Support Request & WAYSIDE RWP Information

Group	Station Report Time	Work Request Time	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time:	Wrk Clear Time:	Wrk Zone CM:	Station Clear Time:
Group 1	Station Report Time:	Work Request Time:	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time:	Wrk Clear Time:	Wrk Zone CM:	Station Clear Time:
Group 2	Station Report Time:	Work Request Time:	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time:	Wrk Clear Time:	Wrk Zone CM:	Station Clear Time:
Group 4	Station Report Time:	Work Request Time:	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time:	Wrk Clear Time:	Wrk Zone CM:	Station Clear Time:
Group 4	Station Report Time:	Work Request Time:	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time:	Wrk Clear Time:	Wrk Zone CM:	Station Clear Time:
Group 4	Station Report Time:	Work Request Time:	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time:	Wrk Clear Time:	Wrk Zone CM:	Station Clear Time:
Group 5	Station Report Time:	Work Request Time:	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time:	Wrk Clear Time:	Wrk Zone CM:	Station Clear Time:
Group 6	Station Report Time:	Work Request Time:	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time:	Wrk Clear Time:	Wrk Zone CM:	Station Clear Time:
Group 7	Station Report Time:	Work Request Time:	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time:	Wrk Clear Time:	Wrk Zone CM:	Station Clear Time:
Group 8	Station Report Time:	Work Request Time:	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time:	Wrk Clear Time:	Wrk Zone CM:	Station Clear Time:

Description Of Work Activities: Report

Group 1: [REDACTED] Flashing Lunar EMI 210376, Finished running new wires for the Flashing Lunar EMI that are not J-relay wire wrap and started to strip and crimp wires. In the B2,T2,B1 racks from the S-row to the B-relays.

Group 2: Crew currently supporting Surge #14 Safe Track. Performed Cranking and Blocking as requested by Track Dept at [REDACTED].
 Performed wayside inspections on track 1 from [REDACTED].

Group 3: Crew currently supporting Surge #14 Safe Track. Performed Cranking and Blocking as requested by Track Dept.
 Performed wayside inspections on track 2 from [REDACTED].

Group 4: Crew continued to run wires in the B1,B2,T1,T2 and T4 racks job is 35% complete.

Group 5: Today [REDACTED] was in RWP class, [REDACTED] and [REDACTED] went on storeroom runs and delivered bond plates [REDACTED], [REDACTED] supported safetrack [REDACTED].

Group 6: Search and locate switch lay out bolt requested by [REDACTED]. Pick up switch contactor and remove diodes. Continue updating rehab switch contactors.

Report Any Incidents or Accident:

CPDO/TASS/ATC/CITPSS WORK ASSIGNMENT

Dept. Supt: [REDACTED] F99 F/C [REDACTED] & Cell Nos [REDACTED] & [REDACTED]

SR. Asst. Supt: [REDACTED] CTF F/O Contact Nos: Office no. [REDACTED] and Cell nos. [REDACTED] & Emergency No [REDACTED]

Date: 4/21/2017

Region: CITPSS Acting Asst. Supt: VACANT - AM / [REDACTED]

AM Shift: [REDACTED] Location - FARRINGTON Call No: [REDACTED] Contact Nos: Office [REDACTED] and Cell [REDACTED]

CITPSS 689 Personnel

Name	Ass. Days	Call #	Truck #	Grade	RWP LV EXPIRE	CIP No	Charge Code	Reporting Location	CHECK IN	CHECK OUT	BRIEF DESCRIPTION OF WORK ASSIGNMENT (S)
[REDACTED]	M-F	[REDACTED]			9/30/2017			6100			Supervisor duties
[REDACTED]	M-F	[REDACTED]	23016	AA	3/31/2017	[REDACTED]	[REDACTED]	6100	600	1400	EMI 210376 [REDACTED]
[REDACTED]	M-F	[REDACTED]		B	4/30/2017	[REDACTED]	[REDACTED]	6100			Vacation
[REDACTED]	M-F	[REDACTED]		B	10/31/2017	[REDACTED]	[REDACTED]	6100	600	1400	EMI 210376 [REDACTED]
[REDACTED]	M-F	[REDACTED]		B	10/31/2017	[REDACTED]	[REDACTED]	6100	600	1400	EMI 210376 [REDACTED]
[REDACTED]	M-F	[REDACTED]		H	4/30/2017	[REDACTED]	[REDACTED]	6100			Vacation

Support Request & WAYSIDE RWP Information

Group 1 Station Report Time:	Work Request Time:	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time: 1000	Wrk Clear Time: 12:30	Wk Zone Chain Markers: TBD	Station Clear Time: 1300 hrs
Group 2 Station Report Time:	Work Request Time:	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time:	Wrk Clear Time:	Wk Zone Chain Markers:	Station Clear Time: hrs
Group 3 Station Report Time:	Work Request Time:	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time:	Wrk Clear Time:	Wk Zone Chain Markers:	Station Clear Time: hrs
Group 4 Station Report Time:	Work Request Time:	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time:	Wrk Clear Time:	Wk Zone Chain Markers:	Station Clear Time: hrs

Description Of Work Activities: Report

Group 1: Crew continued to run wires in the B1,B2 racks. Project is 40% complete.
Group 2:
Group 3:
Group 4:

Additional Remarks:

Report Any Incidents or Accident:

From: [REDACTED]
To: [REDACTED]
Subject: Fwd: [REDACTED] Eve Shift Work Locator
Date: Tuesday, April 18, 2017 4:29:16 PM
Attachments: [04-18-17 Tue \[REDACTED\] Eveshift Work Locator.xlsx](#)
[ATT00001.htm](#)

FYA

Sent from my iPhone

Begin forwarded message:

From: [REDACTED]
Date: April 18, 2017 at 2:53:55 PM EDT
To: [REDACTED]
[REDACTED]
[REDACTED]
Subject: [REDACTED] Eve Shift Work Locator

Good afternoon,

[REDACTED] Eve: 6 Techs, [REDACTED] ATC Class, [REDACTED] Unexcused Sick

[REDACTED]

[REDACTED] Eve ATC Shift Supervisor

[REDACTED] (Office)

[REDACTED] (Cell)

CPDO/TASS/ATC/CITPSS WORK ASSIGNMENT

Dept. Supt: [REDACTED] F99 F/O [REDACTED] & Cell Nos [REDACTED]

SR. Asst. Supt: [REDACTED] CTF F/O Contact Nos: Office no. [REDACTED] and Cell nos. [REDACTED] & Emergency No [REDACTED]

Date: 4/21/2017
 Region: CITPSS Acting Asst. Supt: VACANT - AM / [REDACTED] Contact Nos: VACANT Office no. XXXXXXXXXX and Cell nos. XXX-XXX-XXXX & XXX-XXX-XXXX / [REDACTED] Office no. Contact Nos: Office No. [REDACTED] and Cell Nos [REDACTED]

AM Shift: [REDACTED] Location - FARRINGTON Call No: [REDACTED] Contact Nos: Office No [REDACTED] and Cell Nos [REDACTED]

CITPSS 689 Personnel

Name	Ass. Days	Call #	Truck #	Grade	RWP LV EXPIRE	CIP No	Charge Code	Reporting Location	CHECK IN	CHECK OUT	BRIEF DESCRIPTION OF WORK ASSIGNMENT (S)
[REDACTED]	M-F	[REDACTED]			9/30/2017			6100			Supervisor duties
[REDACTED] J.	M-F	[REDACTED]	23016	AA	3/31/2017	[REDACTED]	[REDACTED]	6100	600	1400	EMI 210376 [REDACTED]
[REDACTED]	M-F	[REDACTED]		B	4/30/2017	[REDACTED]	[REDACTED]	6100			Vacation
[REDACTED]	M-F	[REDACTED]		B	10/31/2017	[REDACTED]	[REDACTED]	6100	600	1400	EMI 210376 [REDACTED]
[REDACTED]	M-F	[REDACTED]		B	10/31/2017	[REDACTED]	[REDACTED]	6100	600	1400	EMI 210376 [REDACTED]
[REDACTED]	M-F	[REDACTED]		H	4/30/2017	[REDACTED]	[REDACTED]	6100			Vacation

Support Request & WAYSIDE RWP Information

Group 1 Station Report Time:	Work Request Time:	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time: 1000	Wrk Clear Time: 12:30	Wrk Zone Chain Markers: TBD	Station Clear Time: 1300 hrs
Group 2 Station Report Time:	Work Request Time:	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time:	Wrk Clear Time:	Wrk Zone Chain Markers:	Station Clear Time: hrs
Group 3 Station Report Time:	Work Request Time:	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time:	Wrk Clear Time:	Wrk Zone Chain Markers:	Station Clear Time: hrs
Group 4 Station Report Time:	Work Request Time:	RWIC/GANG:	Safety Debr. Time:	RWP Level of Protection:	Hot Stick & WRK Zone Set Up Time:	Work Start Time:	Wrk Clear Time:	Wrk Zone Chain Markers:	Station Clear Time: hrs

Description Of Work Activities: Report

Group 1:
 Crew continued to run wires in the B1,B2 racks. Project is 40% complete.

Group 2:

Group 3:

Group 4:

Additional Remarks:

Report Any Incidents or Accident:

From: [REDACTED]
To: [REDACTED]
Subject: Fwd: EOSR- [REDACTED] DAYS WORK LOCATOR 4/18/17
Date: Tuesday, April 18, 2017 4:22:45 PM

FYA

Sent from my iPhone

Begin forwarded message:

From: [REDACTED]
Date: April 18, 2017 at 2:48:50 PM EDT
To: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
Subject: EOSR- [REDACTED] DAYS WORK LOCATOR 4/18/17

All quiet on the [REDACTED] line:

All techs are in

Crew performed PMI below:

PM-WO#13415135-ATCS, [REDACTED], WEEKLY TCR INSPECTION, DAY-FINISHED

PM-WO#13402662-ATCS, [REDACTED], WEEKLY, INTERLOCKING INSPECTION (FRONT INT.),
DAY-FINISHED

PM-WO#13284823-ATCS, [REDACTED], 3 MONTH, HFTC DETECT. SIGNAL LEVEL TEST, &
MODULE INSP. TK2, DAY-FINISHED

CM-WO#13383914 [REDACTED], PLATFORM EDGE LIGHT STAYING ON (FLASHING)- WSUP

With the support of ATC ENG. [REDACTED], he has found software errors for edge
lights in Microlok.

He will work on getting this fixed ASAP

Best regards

[REDACTED]

ATC Shift Supv.

[REDACTED] Office: [REDACTED]

Cell: [REDACTED]

From: [REDACTED]
To: [REDACTED]
Subject: FW: [REDACTED] Wednesday 4-26-17 End Of Shift
Date: Wednesday, April 26, 2017 3:28:42 PM
Attachments: [image001.png](#)
[image003.jpg](#)
[image005.jpg](#)

FYI

From: [REDACTED]
Sent: Wednesday, April 26, 2017 2:09 PM
To: [REDACTED]
[REDACTED]
[REDACTED]
Cc: [REDACTED]
Subject: F Line [REDACTED] Wednesday 4-26-17 End Of Shift

[REDACTED]:

PMI's completed:

- 13284841 – [REDACTED] Shunt Verification Test and wayside inspection.
- 13415028 – [REDACTED] – [REDACTED] TCR Inspection
- 13415072 – [REDACTED] – [REDACTED] Interlocking Inspection

SPDR Work Order INPRG:

13437105 - [REDACTED] / MEDIUM TRK2 [REDACTED] FOR 8 LOOSE SCREW SPIKES IN A ROW ON A PANDROL TIE PLATES -3/4 IN" PUMPING ON THE GAUGE SIDE.

4-26-17 Days: Installed medium speed restrictions as per MOC (REQUESTED BY: [REDACTED]: [REDACTED] [REDACTED]. ISSUE AT [REDACTED] TO [REDACTED])

CM Work order CLOSED:

13436763 - [REDACTED] / SWITCH 7 OUT OF CORRESPONDENCE IN REVERSE.

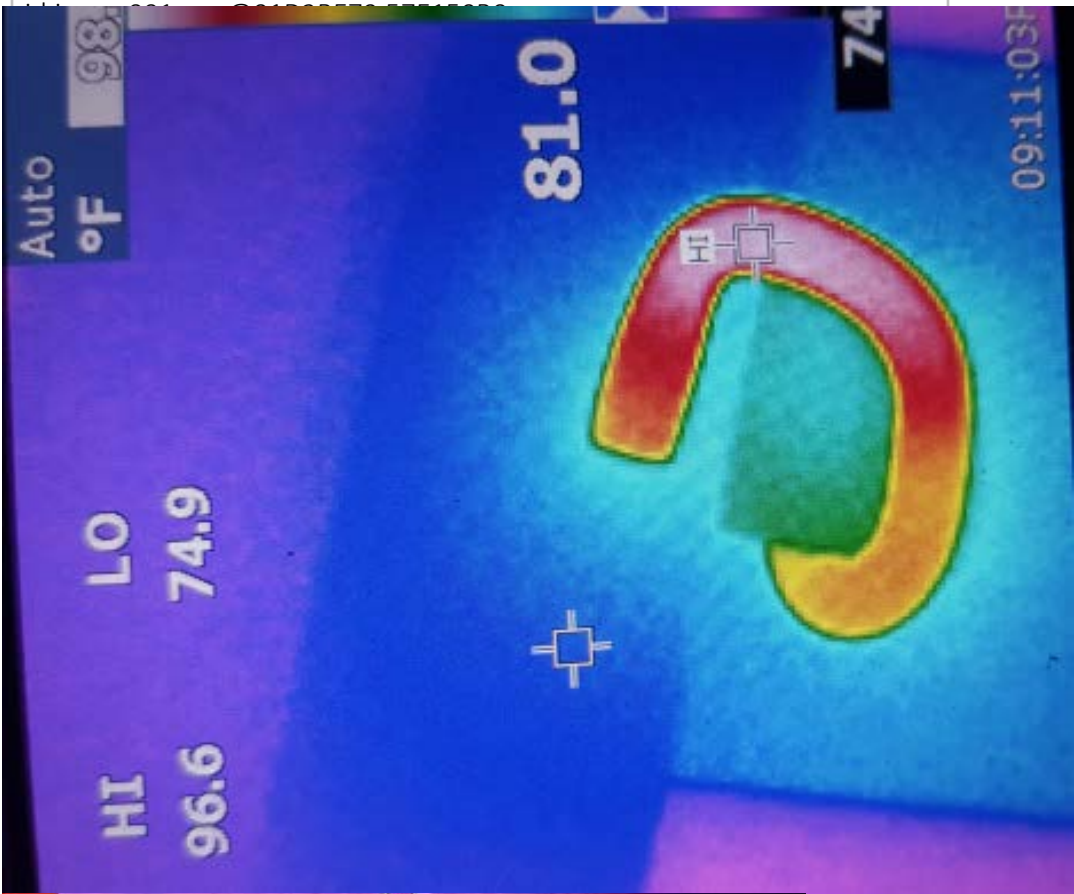
4-26-17 Days: 7 Switch showing out of Correspondence Reverse. Wayside inspection: Found 7A switch not throwing. Motor was defective. Replaced motor. Exercised and obstructed 7A switch. All is operational at this time.

INSP work order CLOSED:

13434234 - [REDACTED] THERMAL HOT SPOT FROG JUMPER IN 3AT - IMAGE ATTACHED

4-25-17 Days: INSP opened by [REDACTED] [REDACTED] Not enough time to investigate.

4-25-17 PM shift: No ATC equipment in that location. Hot spots were 2 rail clips at CH# [REDACTED] - [REDACTED]. Pictures of rail clips attached to work order, Offending rail clips painted "yellow" and Track dept. has been notified.





[REDACTED]

From: [REDACTED]
Sent: Wednesday, April 26, 2017 6:45 AM
To: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
Cc: [REDACTED]
[REDACTED]
Subject: [REDACTED] Wednesday 4-26-17 [REDACTED],

Good morning. See attached.

[REDACTED]

From: [REDACTED]
To: [REDACTED]
Subject: Fwd: [REDACTED] SHIFT REPORT ON 04/18/2017
Date: Tuesday, April 18, 2017 4:20:44 PM

FYA

Sent from my iPhone

Begin forwarded message:

From: [REDACTED]
Date: April 18, 2017 at 2:20:07 PM EDT
To: [REDACTED]
Cc: [REDACTED]
Subject: [REDACTED] **SHIFT REPORT ON 04/18/2017**

Good afternoon,
PM 13284880 ATCS, [REDACTED], 3 MONTH, HFTC DETECT. SIGNAL LEVEL TEST, & MODULE INSP. TK1.
CM 13417555 [REDACTED] IDW problems Zone 2-3.
Replaced TL 30U time cycle and SM 30 IDW alarm is clear. In normal at this time.
Supported power dept. at [REDACTED].
Yard signals, switches and junction boxes inspection for new locks.

Thanks,

[REDACTED]
[REDACTED]
[REDACTED] [REDACTED]
[REDACTED] [REDACTED]
[REDACTED] [REDACTED]

From: [REDACTED]
To: [REDACTED]
Subject: FW: [REDACTED] SHIFT REPORT ON 04/26/2017
Date: Wednesday, April 26, 2017 3:37:05 PM

From: [REDACTED]
Sent: Wednesday, April 26, 2017 2:23 PM
To: [REDACTED]
Cc: [REDACTED]
Subject: [REDACTED] SHIFT REPORT ON 04/26/2017

Good afternoon,

Today the power guys try to fix the problem (the phase different between normal and reserve). But they ask to turn off the normal power first to fix it (cannot turn normal off due to Safe track) and the reserves power already off.

they need to do it after revenue. I will contact [REDACTED] again for more information.

CM # 13434746 [REDACTED] / IDW ALARM [REDACTED]-2-2 & [REDACTED]-2-3.

Found 3 loose plugs (connector) reseated it and try to replicate the problem but could not. Reset the system many times and no error found. Per MOC turn OFF the bypass for Zone 2 and 3 (system in normal now). Ticket still open for observation.

Thanks,

[REDACTED]
[REDACTED]
[REDACTED] [REDACTED]
[REDACTED] [REDACTED]
[REDACTED] [REDACTED]

Work Order 13524183 [REDACTED] TRAINS LOSING SPEED COMMANDS IN INTE [REDACTED] Attachments

Asset 455563

Asset Location 10555 >> [REDACTED] LARGO TOWN C

Failure Class ATCS002

Labor Group ATCSD3 >> [REDACTED]

Supervisor [REDACTED] >> [REDACTED]

Failure Details

Remarks See Remarks---->

Remark Date [REDACTED]

Component [REDACTED]

Failure Codes 1 - 1 of 1

Type	Failure Code
PROBLEM	3458

Long Description

See Remarks---->

Font Size Format None

5-14-17 PM shift: Found loose ring terminal 3RLXN rack location (TM1S6-F2) in the TCR. Verified [REDACTED] cab signal voltage is leaving the TCR for 3RL loop when turned on and train is crossing over from signal 4 to 6. Trains still stopping halfway in 1-3T track circuit. Need to check wayside 3RL loop connection slider straps in G1-622 DJ box and the 3RL loop itself for any damage / breaks. Not enough personnel at this time. [REDACTED]

5-15-17 Mid Shift: Performed Roadway inspection tonight for both 3 RL connections in G1-622 DJ box and the 3 RL itself. Slider straps' connections in the box were tight and no loose ring terminal was found however, upon opening the junction box, we encountered shredded paper debris and suspected mice activities in the box that might have compromised the integrity of the wiring. Further investigation needed. The speed hose itself did not show any apparent damage except that its position has been brought closer to the running rail. Additionally, there was a sub Junction box for this loop under the third rail on track 1. We weren't able to access this box for investigation due to the 3rd rail being energized. Moc was also notified.

Reset Clear

OK Cancel

ATCS [redacted] CM (ATCS) Find: [redacted] Select Action [redacted]

List Work Order Plans Actuals Safety Plan **Failure Reporting** Related Records History Log

Work Order: 12653750 [redacted] GROUND FAULT DETECTEC IS NOT WORKING IN S
Asset: ATCS [redacted]
Asset Location: 10718 [redacted] NEW CARROLLT
Failure Class: [redacted]
Labor Group: ATCSD: [redacted]
Supervisor: [redacted]

Failure Details
Remarks: see long desc.
Remark Date: [redacted]
Component: [redacted]

Failure Codes: 0 - 0 of 0
Type: [redacted] Failure Code: [redacted]

Long Description

see long desc.

Unable to locate correct ground detector. Spoke with material control. They are researching.

2/16/17: Installed the new unit which is new model supposedly to replace the old model. Need to continue with the installation because it's flashing alarms. Not sure if connections are all correct or needs programming to work.

2/17/17:
We wired the ground directly to [redacted] But had to jump T/R to ground to clear the malfunction error [redacted]
Connections for L1 & L2 were tight but kept reading [redacted] This should be low according to the manual.
Programmed the unit to your recommended specs [redacted] Then, the AC-GRD relay doesn't drop when the detector is in test mode. Need assistance.

4/14/17: ATC [redacted] attempted to fix the new ground fault detector but was unsuccessful. Not sure if the problem is wiring or programming. The AC relay still doesn't drop when tested. Also, I need to find another copy of the manual online.

4/15/17 ATC [redacted] we wired the ground directly to [redacted] and the malfunction error [redacted] cleared. But unable to drop the detector relay in test mode. Needs further troubleshooting. R1 [redacted] and R2 [redacted]

Reset Clear

OK Cancel

ATCS CM (ATCS) Find: Select Action

List Work Order Plans Actuals Safety Plan **Failure Reporting** Related Records History Log

Work Order 13580914 SWITCHES 5A/5B OUT OF CORRESPONDENCE IN
Asset 445841
Asset Location 6225 SILVER SPRING
Failure Class ATCS001
Labor Group ATCSD4
Supervisor

Long Description

found blown [REDACTED] REPLACED SAME AND DID ALL TESTS. ALL OK. RETURNED TO SERVICE

after getting permission to go wayside, we obstructed 5A with no issues. During the excising, 5A went OOC Reverse. More testing on 5A, while throwing Normal, we got [REDACTED] and throwing reverse [REDACTED] on the contactor. Advised OCC that both 5A and 5B were OOS and clamped in normal position. Both supervisor and MOC notified.

Font: Size: Format: None

Reset Clear

OK Cancel

Failure Details

Remarks found blown [REDACTED] 5ARW. REPLACE
Remark Date
Component 100-111-021

Failure Codes 1 - 3 of 3

Type	Failure Code
PROBLEM	2581
CAUSE	1166
REMEDY	0004

Select Failure Codes

ATCS CM (ATCS) Find: Select Action

List Work Order Plans Actuals Safety Plan **Failure Reporting** Related Records History Log

Work Order 13586348 SWITCH 3A/B OUT OF CORRESPONDENCE IN REV

Asset 443994

Asset Location 3678 DECOMISSIONED AS

Failure Class ATCS001

Labor Group ATCSD1

Supervisor

Failure Details

Remarks see long description

Remark Date

Component 100-111-021-400-010

Failure Codes 1 - 3 of 3

Type	Failure Code
PROBLEM	2581
CAUSE	1063
REMEDY	1029

Long Description

see long description

we inspected sw3B and due to tie movement SW 3B went Out reverse . We made adjustment and obstructed sw3B. Ok . SW 3B Backed to service . Notified MOC And OCC.

Reset Clear

OK Cancel

Matthew

Download

Select Failure Codes

<p>Work Order: 13600860 [REDACTED] SWITCH 108 OUT OF CORRESPONDENCE</p> <p>Asset: 366803 [REDACTED] ATCS [REDACTED] YARD SWITCHES</p> <p>Asset Location: 2930 [REDACTED] GREENBELT YARD, BUILDING (E) TBS/TCR, TRAIN</p> <p>Failure Class: ATCS001</p> <p>Labor Group: ATCSD4 [REDACTED]</p> <p>Supervisor: [REDACTED]</p>	<p>Attachments</p> <p>Parent WO: [REDACTED]</p> <p>Work Type: CM</p> <p>Status: INPRG</p> <p>Status Date: 6/21/17 6:33</p> <p>Modified By: [REDACTED]</p> <p>Modified Date: 6/21/17 6:33</p>
--	---

Failure Details

Remarks:

Remark Date:

Component: 100-111-021 [REDACTED] SWITCH

Failure Codes 1 - 1 of 1

Type	Failure Code	Description
PROBLEM	2581	OUT OF CORP

Long Description

Font: Size: Format: None

ATCS CM (ATCS, AL) Find: Select Action [Icons]

List Work Order Plans Actuals Safety Plan **Failure Reporting** Related Records History Log

Work Order: 13598382 [REDACTED] PLEASE REPLACE BOND FOR TRK CIRCUIT B2-231

Asset: AB2-231 ATCS, HF TRACK CIRCUITS, [REDACTED]

Asset Location: 6423 BROOKLAND, STATION, [REDACTED] TR

Failure Class: ATCS002

Labor Group: ATCSD1 [REDACTED]

Supervisor: [REDACTED]

Attachments: Parent WO [REDACTED] Work Type: CM Status: INPRG Status Date: 6/20/17 22:02 Modified By: [REDACTED]

Failure Details

Remarks: SEE LONG DESC

Remark Date: [REDACTED]

Component: [REDACTED]

Failure Codes 1 - 3 of 3

Type	Failure Code	Descrip
PROBLEM	2142	INTER
CAUSE	4521	DEFEC
REMEDY	4425	REMOV

Long Description

SEE LONG DESC

Font Size Format None

B I U

MOC CALL US FOR B2-231 BOBBING!
 THIS TRACK CKT PROBLEM IS THE SAME PROBLEM WITH WO#13593383. TICKET OPENED AT 06/16 .. WE WANT WAYSIDE AND DOUBEL CHECK ALL CONNECTION ,THE TX IS TOO LOW .. TODAY WE PICK IT UP FROM THE STORE AND READY FOR NEXT CROW TO INSTALLE. WZ BOND IS AT THE TCR B05.

PM SHIFT.

We replaced WZ BOND(for TX TRK B2-231) and Adjusted TRK B2-231 and TRK B2-228. The TX Level for TRK B2-231 changed from [REDACTED] and TRK B2-228 changed from [REDACTED] verified 3 Points on Both TRK B2-231 and TRK B2-228. OK. this ticket open for further observation

ATC [REDACTED]

Reset Clear

OK Cancel

Download

Select Failure Codes

9.4 Reference 4: MPLN MONTHLY PREVENTATIVE MAINTENANCE SUMMARY

MPLN Monthly Preventive Maintenance Summary
PM Scheduled in January 10, 2017
Reporting Date: February 10, 2017

AUTOMATIC TRAIN CONTROL DIVISION (ATC)		
<u>Branch/Type</u>	<u>Scheduled</u>	<u>Completed</u>
10 Year, Cable Insulation Resistance Test		
2 Year, Ac Vane Relay Inspection and Test		
4 Year, DC Vital Relay Inspection and Test	5	3
2 Year, Switch Detector and Route Locking Test	2	2
2 Year, Approach, Time, Signal Indication Locking Test	2	2
1 Year, Time Release, Timing Relays/Devices Test	16	14
3 Mnth, Restoration, CWP and Point Detector Test		
1 Month, Switch Obstruction Test	94	92
1 Month Switch Obstruction, Speed rater		
2 Year, Switch Indication Locking Test	2	1
2 Year, Traffic Locking Test	2	2
1 Month, TCR Ground Fault Inspection and Test	118	118
2 Year, TRC Ground Validation Test	2	0
3 Month, HFTC Detection Signal Level Test	70	70
1 Year, HF Track Circuit Cab Transmit Level Test	8	8
5 Year, HF Track Circuit Cab Roadway Transmit Level Test		
5 Year, Open Door Command Spillover Test		
3 Month, Power Frequency Track Circuit Test	24	24
2 Year, Ansaldo STS/US&S Open Bond Line Test	38	37
3 Month, Shunt Verification Test	24	23
3 Month, Shunt Verification Test & Wayside Inspection	70	66
1 Year, HF Track Circuit Uninteded Signal Test	62	58
1 Year, Alstom Code Rate Frequency Test		
6 Month, GRS ATP Module Gen 2 Parasitic Oscillation Test		
1 Month, Grade Crossing Inspections and Test	1	1
1 Year, Grade Crossing Inspection and Test		
3 Year, IDW Panel Inspection Test		
6 Month, BOP Inspection	4	4
Weekly, Train Control Inspection Test (TCR)	483	481
Weekly, Interlocking Inspection Test	283	283
3 Month, Wayside Inspection		
1 Year, Power Supply Inspection and Test		
1 Yaer, TWC Inspection and Test	20	19
1 Year, RTU Inspection and Test	18	18
1 Year, Automatic Transfer Switch Inspection and Test		
1 Year, IDW Inspection		
1 Year, Snowmelter Inspections and Test		
1 Year, Wayside Pushbutton Box Inspection Test	5	3
2 Year, Tabil Inspection and Test		
Yearly, Transfer Panel Inspection Test		
Yearly, Fall Speed Test		
1 Month, Switch Obstruction Test and Joint Interlocking Inspection		
Total	1353	1329

MPLN Monthly Preventive Maintenance Summary
PM Scheduled in February 10, 2017
Reporting Date: March 10, 2017

AUTOMATIC TRAIN CONTROL DIVISION (ATC)		
<u>Branch/Type</u>	<u>Scheduled</u>	<u>Completed</u>
10 Year, Cable Insulation Resistance Test		
2 Year, Ac Vane Relay Inspection and Test	2	2
4 Year, DC Vital Relay Inspection and Test		
2 Year, Switch Detector and Route Locking Test	4	3
2 Year, Approach, Time, Signal Indication Locking Test	4	3
1 Year, Time Release, Timing Relays/Devices Test	8	6
3 Mnth, Restoration, CWP and Point Detector Test		
1 Month, Switch Obstruction Test	94	94
1 Month Switch Obstruction, Speed rater	1	
2 Year, Switch Indication Locking Test	4	3
2 Year, Traffic Locking Test	4	2
1 Month, TCR Ground Fault Inspection and Test	119	119
2 Year, TRC Ground Validation Test		
3 Month, HFTC Detection Signal Level Test	77	77
1 Year, HF Track Circuit Cab Transmit Level Test	8	8
5 Year, HF Track Circuit Cab Roadway Transmit Level Test		
5 Year, Open Door Command Spillover Test		
3 Month, Power Frequency Track Circuit Test	30	30
2 Year, Ansaldo STS/US&S Open Bond Line Test	40	40
3 Month, Shunt Verification Test	30	30
3 Month, Shunt Verification Test & Wayside Inspection	78	78
1 Year, HF Track Circuit Uninteded Signal Test		
1 Year, Alstom Code Rate Frequency Test		
6 Month, GRS ATP Module Gen 2 Parasitic Oscillation Test		
1 Month, Grade Crossing Inspections and Test		
1 Year, Grade Crossing Inspection and Test	1	1
3 Year, IDW Panel Inspection Test		
6 Month, BOP Inspection	6	6
Weekly, Train Control Inspection Test (TCR)	476	474
Weekly, Interlocking Inspection Test	287	287
3 Month, Wayside Inspection		
1 Year, Power Supply Inspection and Test		
1 Yaer, TWC Inspection and Test	20	20
1 Year, RTU Inspection and Test	17	17
1 Year, Automatic Transfer Switch Inspection and Test	7	6
1 Year, IDW Inspection		
1 Year, Snowmelter Inspections and Test		
1 Year, Wayside Pushbutton Box Inspection Test	2	
2 Year, Tabil Inspection and Test		
Yearly, Transfer Panel Inspection Test		
Yearly, Fall Speed Test		
1 Month, Switch Obstruction Test and Joint Interlocking Inspection		
Total	1319	1306

MPLN Monthly Preventive Maintenance Summary
PM Scheduled in March 10, 2017
Reporting Date: April 10, 2017

AUTOMATIC TRAIN CONTROL DIVISION (ATC)		
<u>Branch/Type</u>	<u>Scheduled</u>	<u>Completed</u>
10 Year, Cable Insulation Resistance Test		
2 Year, Ac Vane Relay Inspection and Test		
4 Year, DC Vital Relay Inspection and Test		
2 Year, Switch Detector and Route Locking Test		
2 Year, Approach, Time, Signal Indication Locking Test		
1 Year, Time Release, Timing Relays/Devices Test		
3 Mnth, Restoration, CWP and Point Detector Test	94	90
1 Month, Switch Obstruction Test	94	90
1 Month Switch Obstruction, Speed rater	2	2
2 Year, Switch Indication Locking Test		
2 Year, Traffic Locking Test		
1 Month, TCR Ground Fault Inspection and Test	119	119
2 Year, TRC Ground Validation Test		
3 Month, HFTC Detection Signal Level Test	75	74
1 Year, HF Track Circuit Cab Transmit Level Test	7	6
5 Year, HF Track Circuit Cab Roadway Transmit Level Test	6	4
5 Year, Open Door Command Spillover Test	6	4
3 Month, Power Frequency Track Circuit Test	30	29
2 Year, Ansaldo STS/US&S Open Bond Line Test	32	32
3 Month, Shunt Verification Test	30	28
3 Month, Shunt Verification Test & Wayside Inspection	75	70
1 Year, HF Track Circuit Uninteded Signal Test	5	4
1 Year, Alstom Code Rate Frequency Test		
6 Month, GRS ATP Module Gen 2 Parasitic Oscillation Test		
1 Month, Grade Crossing Inspections and Test	1	1
1 Year, Grade Crossing Inspection and Test		
3 Year, IDW Panel Inspection Test		
6 Month, BOP Inspection	9	9
Weekly, Train Control Inspection Test (TCR)	573	571
Weekly, Interlocking Inspection Test	342	335
3 Month, Wayside Inspection		
1 Year, Power Supply Inspection and Test		
1 Yaer, TWC Inspection and Test	20	20
1 Year, RTU Inspection and Test	19	18
1 Year, Automatic Transfer Switch Inspection and Test	15	15
1 Year, IDW Inspection		
1 Year, Snowmelter Inspections and Test		
1 Year, Wayside Pushbutton Box Inspection Test		
2 Year, Tabil Inspection and Test		
Yearly, Transfer Panel Inspection Test		
Yearly, Fall Speed Test		
1 Month, Switch Obstruction Test and Joint Interlocking Inspection		
Total	1554	1521

MPLN Monthly Preventive Maintenance Summary
PM Scheduled in July 10, 2016
Reporting Date: August 10, 2016

AUTOMATIC TRAIN CONTROL DIVISION (ATC)		
Branch/Type	Scheduled	Completed
10 Year, Cable Insulation Resistance Test		
2 Year, Ac Vane Relay Inspection and Test		
4 Year, DC Vital Relay Inspection and Test	1	
2 Year, Switch Detector and Route Locking Test		
2 Year, Approach, Time, Signal Indication Locking Test	2	1
1 Year, Time Release, Timing Relays/Devices Test		
3 Mnth, Restoration, CWP and Point Detector Test		
1 Month, Switch Obstruction Test	93	92
2 Year, Switch Indication Locking Test		
2 Year, Traffic Locking Test	2	1
1 Month, TCR Ground Fault Inspection and Test	119	109
2 Year, TRC Ground Validation Test		
3 Month, HFTC Detection Signal Level Test	70	67
1 Year, HF Track Circuit Cab Transmit Level Test		
5 Year, HF Track Circuit Cab Roadway Transmit Level Test	4	
5 Year, Open Door Command Spillover Test	4	
3 Month, Power Frequency Track Circuit Test	24	24
2 Year, Ansaldo STS/US&S Open Bond Line Test		
3 Month, Shunt Verification Test	24	24
3 Month, Shunt Verification Test & Wayside Inspection	70	64
1 Year, HF Track Circuit Uninteded Signal Test		
1 Year, Alstom Code Rate Frequency Test		
6 Month, GRS ATP Module Gen 2 Parasitic Oscillation Test		
1 Month, Grade Crossing Inspections and Test	1	
1 Year, Grade Crossing Inspection and Test		
3 Year, IDW Panel Inspection Test		
6 Month, BOP Inspection	4	4
Weekly, Train Control Inspection Test (TCR)	486	476
Weekly, Interlocking Inspection Test	284	274
3 Month, Wayside Inspection		
1 Year, Power Supply Inspection and Test		
1 Year, TWC Inspection and Test	12	12
1 Year, RTU Inspection and Test	12	12
1 Year, Automatic Transfer Switch Inspection and Test	14	12
1 Year, IDW Inspection		
1 Year, Snowmelter Inspections and Test		
1 Year, Wayside Pushbutton Box Inspection Test	1	1
2 Year, Tabil Inspection and Test		
Yearly, Transfer Panel Inspection Test		
Yearly, Fall Speed Test		
1 Month, Switch Obstruction Test and Joint Interlocking Inspection		
Total	1227	1173

MPLN Monthly Preventive Maintenance Summary
PM Scheduled in August 10, 2016
Reporting Date: September 10, 2016

AUTOMATIC TRAIN CONTROL DIVISION (ATC)		
Branch/Type	Scheduled	Completed
10 Year, Cable Insulation Resistance Test		
2 Year, Ac Vane Relay Inspection and Test	11	9
4 Year, DC Vital Relay Inspection and Test	2	1
2 Year, Switch Detector and Route Locking Test		
2 Year, Approach, Time, Signal Indication Locking Test		
1 Year, Time Release, Timing Relays/Devices Test		
3 Mnth, Restoration, CWP and Point Detector Test		
1 Month, Switch Obstruction Test	93	92
2 Year, Switch Indication Locking Test		
2 Year, Traffic Locking Test		
1 Month, TCR Ground Fault Inspection and Test	119	117
2 Year, TRC Ground Validation Test		
3 Month, HFTC Detection Signal Level Test	78	76
1 Year, HF Track Circuit Cab Transmit Level Test		
5 Year, HF Track Circuit Cab Roadway Transmit Level Test	2	
5 Year, Open Door Command Spillover Test	2	
3 Month, Power Frequency Track Circuit Test	30	30
2 Year, Ansaldo STS/US&S Open Bond Line Test		
3 Month, Shunt Verification Test	30	30
3 Month, Shunt Verification Test & Wayside Inspection	78	74
1 Year, HF Track Circuit Uninteded Signal Test	68	66
1 Year, Alstom Code Rate Frequency Test		
6 Month, GRS ATP Module Gen 2 Parasitic Oscillation Test		
1 Month, Grade Crossing Inspections and Test	1	1
1 Year, Grade Crossing Inspection and Test		
3 Year, IDW Panel Inspection Test		
6 Month, BOP Inspection	6	6
Weekly, Train Control Inspection Test (TCR)	474	469
Weekly, Interlocking Inspection Test	284	283
3 Month, Wayside Inspection		
1 Year, Power Supply Inspection and Test		
1 Year, TWC Inspection and Test	16	15
1 Year, RTU Inspection and Test	17	16
1 Year, Automatic Transfer Switch Inspection and Test	8	6
1 Year, IDW Inspection		
1 Year, Snowmelter Inspections and Test		
1 Year, Wayside Pushbutton Box Inspection Test	1	1
2 Year, Tabil Inspection and Test		
Yearly, Transfer Panel Inspection Test		
Yearly, Fall Speed Test		
1 Month, Switch Obstruction Test and Joint Interlocking Inspection		
Total	1320	1292

MPLN Monthly Preventive Maintenance Summary
PM Scheduled in September 10, 2016
Reporting Date: October 10, 2016

AUTOMATIC TRAIN CONTROL DIVISION (ATC)		
Branch/Type	Scheduled	Completed
10 Year, Cable Insulation Resistance Test		
2 Year, Ac Vane Relay Inspection and Test		
4 Year, DC Vital Relay Inspection and Test		
2 Year, Switch Detector and Route Locking Test		
2 Year, Approach, Time, Signal Indication Locking Test		
1 Year, Time Release, Timing Relays/Devices Test	6	1
3 Mnth, Restoration, CWP and Point Detector Test	93	88
1 Month, Switch Obstruction Test	94	89
2 Year, Switch Indication Locking Test		
2 Year, Traffic Locking Test		
1 Month, TCR Ground Fault Inspection and Test	119	108
2 Year, TRC Ground Validation Test		
3 Month, HFTC Detection Signal Level Test	75	73
1 Year, HF Track Circuit Cab Transmit Level Test		
5 Year, HF Track Circuit Cab Roadway Transmit Level Test	6	
5 Year, Open Door Command Spillover Test	4	
3 Month, Power Frequency Track Circuit Test	30	29
2 Year, Ansaldo STS/US&S Open Bond Line Test		
3 Month, Shunt Verification Test	30	28
3 Month, Shunt Verification Test & Wayside Inspection	75	69
1 Year, HF Track Circuit Uninteded Signal Test	64	59
1 Year, Alstom Code Rate Frequency Test		
6 Month, GRS ATP Module Gen 2 Parasitic Oscillation Test		
1 Month, Grade Crossing Inspections and Test	1	1
1 Year, Grade Crossing Inspection and Test		
3 Year, IDW Panel Inspection Test		
6 Month, BOP Inspection	9	6
Weekly, Train Control Inspection Test (TCR)	577	561
Weekly, Interlocking Inspection Test	353	334
3 Month, Wayside Inspection		
1 Year, Power Supply Inspection and Test		
1 Year, TWC Inspection and Test	12	12
1 Year, RTU Inspection and Test	12	12
1 Year, Automatic Transfer Switch Inspection and Test	12	9
1 Year, IDW Inspection	1	1
1 Year, Snowmelter Inspections and Test	56	20
1 Year, Wayside Pushbutton Box Inspection Test	6	2
2 Year, Tabil Inspection and Test		
Yearly, Transfer Panel Inspection Test		
Yearly, Fall Speed Test		
1 Month, Switch Obstruction Test and Joint Interlocking Inspection		
Total	1635	1502

MPLN Monthly Preventive Maintenance Summary
PM Scheduled in September 10, 2016
Reporting Date: October 10, 2016

AUTOMATIC TRAIN CONTROL DIVISION (ATC)		
Branch/Type	Scheduled	Completed
10 Year, Cable Insulation Resistance Test		
2 Year, Ac Vane Relay Inspection and Test		
4 Year, DC Vital Relay Inspection and Test	3	1
2 Year, Switch Detector and Route Locking Test	2	
2 Year, Approach, Time, Signal Indication Locking Test		
1 Year, Time Release, Timing Relays/Devices Test	9	8
3 Mnth, Restoration, CWP and Point Detector Test		
1 Month, Switch Obstruction Test	94	91
2 Year, Switch Indication Locking Test	1	1
2 Year, Traffic Locking Test		
1 Month, TCR Ground Fault Inspection and Test	119	117
2 Year, TRC Ground Validation Test		
3 Month, HFTC Detection Signal Level Test	70	68
1 Year, HF Track Circuit Cab Transmit Level Test	62	57
5 Year, HF Track Circuit Cab Roadway Transmit Level Test	6	
5 Year, Open Door Command Spillover Test	4	2
3 Month, Power Frequency Track Circuit Test	24	22
2 Year, Ansaldo STS/US&S Open Bond Line Test		
3 Month, Shunt Verification Test	24	22
3 Month, Shunt Verification Test & Wayside Inspection	70	63
1 Year, HF Track Circuit Uninteded Signal Test		
1 Year, Alstom Code Rate Frequency Test		
6 Month, GRS ATP Module Gen 2 Parasitic Oscillation Test	2	2
1 Month, Grade Crossing Inspections and Test		
1 Year, Grade Crossing Inspection and Test	1	1
3 Year, IDW Panel Inspection Test		
6 Month, BOP Inspection	31	31
Weekly, Train Control Inspection Test (TCR)	484	481
Weekly, Interlocking Inspection Test	284	277
3 Month, Wayside Inspection		
1 Year, Power Supply Inspection and Test		
1 Year, TWC Inspection and Test	1	1
1 Year, RTU Inspection and Test	1	1
1 Year, Automatic Transfer Switch Inspection and Test	9	8
1 Year, IDW Inspection	10	9
1 Year, Snowmelter Inspections and Test		
1 Year, Wayside Pushbutton Box Inspection Test	3	1
2 Year, Tabil Inspection and Test		
Yearly, Transfer Panel Inspection Test		
Yearly, Fall Speed Test	10	8
1 Month, Switch Obstruction Test and Joint Interlocking Inspection		
Total	1324	1272

MPLN Monthly Preventive Maintenance Summary
PM Scheduled in November 10, 2016
Reporting Date: December 10, 2016

AUTOMATIC TRAIN CONTROL DIVISION (ATC)		
<u>Branch/Type</u>	<u>Scheduled</u>	<u>Completed</u>
10 Year, Cable Insulation Resistance Test		
2 Year, Ac Vane Relay Inspection and Test		
4 Year, DC Vital Relay Inspection and Test		
2 Year, Switch Detector and Route Locking Test		
2 Year, Approach, Time, Signal Indication Locking Test		
1 Year, Time Release, Timing Relays/Devices Test	3	2
3 Mnth, Restoration, CWP and Point Detector Test		
1 Month, Switch Obstruction Test	94	93
1 Month Switch Obstruction, Speed rater	2	2
2 Year, Switch Indication Locking Test		
2 Year, Traffic Locking Test		
1 Month, TCR Ground Fault Inspection and Test	121	120
2 Year, TRC Ground Validation Test		
3 Month, HFTC Detection Signal Level Test	77	76
1 Year, HF Track Circuit Cab Transmit Level Test	70	68
5 Year, HF Track Circuit Cab Roadway Transmit Level Test	2	
5 Year, Open Door Command Spillover Test	4	2
3 Month, Power Frequency Track Circuit Test	30	30
2 Year, Ansaldo STS/US&S Open Bond Line Test		
3 Month, Shunt Verification Test	30	30
3 Month, Shunt Verification Test & Wayside Inspection	78	76
1 Year, HF Track Circuit Uninteded Signal Test		
1 Year, Alstom Code Rate Frequency Test		
6 Month, GRS ATP Module Gen 2 Parasitic Oscillation Test	1	1
1 Month, Grade Crossing Inspections and Test	1	1
1 Year, Grade Crossing Inspection and Test		
3 Year, IDW Panel Inspection Test		
6 Month, BOP Inspection	35	35
Weekly, Train Control Inspection Test (TCR)	484	480
Weekly, Interlocking Inspection Test	284	281
3 Month, Wayside Inspection		
1 Year, Power Supply Inspection and Test		
1 Yaer, TWC Inspection and Test		
1 Year, RTU Inspection and Test		
1 Year, Automatic Transfer Switch Inspection and Test	3	1
1 Year, IDW Inspection		
1 Year, Snowmelter Inspections and Test		
1 Year, Wayside Pushbutton Box Inspection Test	2	1
2 Year, Tabil Inspection and Test		
Yearly, Transfer Panel Inspection Test		
Yearly, Fall Speed Test		
1 Month, Switch Obstruction Test and Joint Interlocking Inspection		
Total	1321	1299

MPLN Monthly Preventive Maintenance Summary
PM Scheduled in December 10, 2016
Reporting Date: January 10, 2017

AUTOMATIC TRAIN CONTROL DIVISION (ATC)		
<u>Branch/Type</u>	<u>Scheduled</u>	<u>Completed</u>
10 Year, Cable Insulation Resistance Test		
2 Year, Ac Vane Relay Inspection and Test	4	4
4 Year, DC Vital Relay Inspection and Test	5	
2 Year, Switch Detector and Route Locking Test	4	
2 Year, Approach, Time, Signal Indication Locking Test	2	
1 Year, Time Release, Timing Relays/Devices Test	8	2
3 Mnth, Restoration, CWP and Point Detector Test	94	
1 Month, Switch Obstruction Test	94	92
1 Month Switch Obstruction, Speed rater		
2 Year, Switch Indication Locking Test	4	2
2 Year, Traffic Locking Test	2	
1 Month, TCR Ground Fault Inspection and Test	119	118
2 Year, TRC Ground Validation Test		
3 Month, HFTC Detection Signal Level Test	75	73
1 Year, HF Track Circuit Cab Transmit Level Test	68	66
5 Year, HF Track Circuit Cab Roadway Transmit Level Test	4	
5 Year, Open Door Command Spillover Test	2	2
3 Month, Power Frequency Track Circuit Test	30	30
2 Year, Ansaldo STS/US&S Open Bond Line Test		
3 Month, Shunt Verification Test	30	30
3 Month, Shunt Verification Test & Wayside Inspection	75	72
1 Year, HF Track Circuit Uninteded Signal Test		
1 Year, Alstom Code Rate Frequency Test		
6 Month, GRS ATP Module Gen 2 Parasitic Oscillation Test	4	4
1 Month, Grade Crossing Inspections and Test	1	1
1 Year, Grade Crossing Inspection and Test	1	1
3 Year, IDW Panel Inspection Test		
6 Month, BOP Inspection	36	36
Weekly, Train Control Inspection Test (TCR)	586	581
Weekly, Interlocking Inspection Test	354	352
3 Month, Wayside Inspection		
1 Year, Power Supply Inspection and Test		
1 Yaer, TWC Inspection and Test		
1 Year, RTU Inspection and Test		
1 Year, Automatic Transfer Switch Inspection and Test	2	2
1 Year, IDW Inspection		
1 Year, Snowmelter Inspections and Test		
1 Year, Wayside Pushbutton Box Inspection Test	2	
2 Year, Tabil Inspection and Test		
Yearly, Transfer Panel Inspection Test		
Yearly, Fall Speed Test	12	11
1 Month, Switch Obstruction Test and Joint Interlocking Inspection		
Total	1618	1479

9.5 Reference 5: MAXIMO SCREENSHOTS and REPORTS

WO Tracking (ATCS) | Bulletins: (0) | Go To | Reports | Start Center | Profile | Sign Out | Help

Find: [] Select Action []

Work Order: 13320187 | ATCS [] WEEKLY, INTERLOCKING INSPECTION, DAY
 Asset: ATCS [] >> [] ATCS, TRAIN CONTROL ROOM, INTERI
 Asset Location: 1091 >> WASHINGTON METROPOLITAN AREA TRANSIT AUTHO
 Start Chain Marker: []
 Start Offset (ft): []
 End Chain Marker: []
 End Offset (ft): []

View Attachments

Document	Description	Document Folder	Document Version	Print?
FORM 3003	ATCS, Interlocking Inspection Data Sheet, Rev 1.0	ATCS-PROC		<input checked="" type="checkbox"/>
TEST 3003	Interlocking Inspections Rev 2.0	ATCS-PROC		<input checked="" type="checkbox"/>

Responsibility: []
 Superv: []
 Lead C: []
 Maintenance Office: ATCS-TSSM-BRFO
 Owning Office: ATCS-TSSM

Job Details

Requested By: []
 Created By: PMCRON >> PM cron-task usage
 Failure Class: []
 Problem Code: []

Prerequisites

None

Frequency

Weekly, or after modification, repair, or disarrangement of equipment layouts.

Special Tools and Test Equipment


PPE; switch wrenches; standard hand tools

Records

Form 3003 – copy filed in TCR location record book; original filed with Region ATC field office

Revised
8/21/2014

ATC-3000 Revision 1.0
Page 13 of 165
ATC-3000-1.0-082114.docx

	Washington Metropolitan Area Transit Authority	
	ATC-3000	Preventative Maintenance and Technical Procedures Manual
	3003 – Interlocking Inspections	

9.6 Reference 6: FRA STANDARDS SECTION 236

CLICK TO VISIT ELECTRONIC CODE OF FEDERAL REGULATIONS PART 236