



**WMSC Commissioner Brief: W-0273 – Improper Rail Vehicle Movement – D&G Junction (Blue, Orange, Silver Lines)
– May 28, 2023**

Prepared for Washington Metrorail Safety Commission meeting on May 14, 2024

Safety event summary:

Based on a supervisor's instruction to permit a vehicle to move to a specific location, a Rail Traffic Controller improperly provided permission to the operator of Prime Mover 43 to pass a red signal when switches were not clamped as required for safe movement.

At 5:54 a.m. Sunday, May 28, 2023 (when the system was not yet open to passengers), Switch 11A at the D&G Junction (the location east of Stadium-Armory Station where Orange Line tracks and Blue and Silver Line tracks diverge/meet) went out of correspondence. This means that the Automatic Train Control system cannot accurately verify the position of the switch. The switch location out of correspondence is indicated to Rail Traffic Controllers through the supervisory control and data acquisition (SCADA) system, with the indication displayed on the Advanced Information Management (AIM) system screen. As intended under Metrorail's system design, the switch out of correspondence also triggered red signals at that interlocking. At 5:57 a.m., Metrorail dispatched an Automatic Train Control Maintenance crew to troubleshoot the issue.

At 6:00 a.m. the Rail Traffic Controller provided movement instructions to the Equipment Operator of Prime Mover 43 with an absolute block (no other vehicles permitted in the area of movement) to Capitol Heights Station, which was then changed at 6:05 a.m. to Addison Road Station. The Equipment Operator acknowledged these instructions. At 6:08 a.m., the Rail Traffic Controller, based on direction from the Rail Operations Control Center Assistant Operations Manager who had just come on duty at 6:00 a.m., instructed the Equipment Operator that the absolute block had changed to end at D2 280+00, which the Equipment Operator also acknowledged. At 6:12 a.m., the Equipment Operator reported that the crew was holding at Capitol Heights Station for an inspection. At 6:15 a.m., the Equipment Operator reported that personnel were clear and it was safe to continue movement.

Later investigation determined that the Assistant Operations Manager had directed the Rail Traffic Controller to instruct the Equipment Operator to move to Chain Marker D2 280+00. This location is 507 feet beyond (in the direction of travel) signal D98-52, which is located at D2 285+07. The Assistant Operations Manager had intended for the vehicle to stop before the signal and for a Track Supervisor on the vehicle to clamp the switch prior to movement. According to statements provided during the investigation, the Rail Traffic Controller had planned to give the protective block to the red signal, but the Assistant Operations Manager directed the extension of the block to limit the time required to walk from the signal to the switch location.

At the time permission was given to pass the red signal, Prime Mover 43 was on the Blue and Silver Line tracks between Morgan Boulevard and Downtown Largo Stations returning from overnight rail renewal work and needed to move west through the D&G Junction in order to eventually return to New Carrollton Rail Yard as the system prepared to open to passengers for the day. Metrorail procedures require switch positions that are showing as out of correspondence to be verified and clamped prior to rail vehicle movement. However, at 6:15 a.m., based on the prior direction from the Assistant Operations Manager, the Radio Rail Traffic Controller again instructed the Equipment Operator that they had



an absolute block to D2 280+00. The Radio Rail Traffic Controller also provided permission to the Equipment Operator to pass red signal D98-52. Switch 11 had not been clamped.

Just prior to Prime Mover 43 reaching the area, the ATC Maintenance crew arrived. They requested to conduct their work under Exclusive Track Occupancy – Local Signal Control protection. The ATCM Roadway Worker In Charge stated that they had local control just prior to the Prime Mover entering the interlocking. This occurred prior to the Rail Traffic Controller rescinding permission to the Equipment Operator to travel through this area. At 6:22 a.m., Prime Mover 43 passed the red signal. The Rail Traffic Controller radioed the Equipment Operator to stop the vehicle. The Equipment Operator stopped Prime Mover 43 approximately 500 feet from the misaligned switch, which was the second switch that the vehicle would have traversed. The Equipment Operator reported that the vehicle stopped with approximately one-third of the vehicle beyond the red signal.

The ATC work crew clamped switch 11 and switch 7 in the required positions.

At 6:45 a.m., the Rail Traffic Controller provided the Equipment Operator with an absolute block to Eastern Market Station, track 2, and the Equipment Operator moved the vehicle through the clamped switches. The vehicle was later moved to New Carrollton Rail Yard.

The ATC Maintenance crew made adjustments to switch 11 and restored switch 11 to normal operation at 7:02 a.m.

Metrorail removed the Assistant Operations Manager from service for post-event drug and alcohol testing as required by Metrorail procedures.

Probable Cause:

The probable cause of this event was the ineffective use of all available resources to assure a safe and efficient operation. Specifically, the improper direction from the Assistant Operations Manager was not identified or corrected prior to Prime Mover 43 passing a red signal when a switch on the route was misaligned, risking derailment.

Corrective Actions:

Metrorail provided safety briefings to Rail Traffic Controllers and posted information on the screen at the front of the room stating that they are empowered to speak up if they identify a problem, and to prioritize airing critical information such as instruction to stop movement when attempting to contact the intended permission.

Metrorail re-instructed the Assistant Operations Manager and Rail Traffic Controller on permissions issued for passing red signals.

Examples of other related open CAPs

- Metrorail currently has related open CAP C-0181 addressing the finding that elements of Metrorail have a culture that accepts noncompliance with written operational rules, instructions, and manuals. (Expected completion date October 2024). Metrorail has revised its Safety Management System related to Rail Operations. This has included implementing new methods of hazard and risk reporting, training of personnel on reporting and implementation of a new data collection system for those issues so they can be properly



evaluated and addressed. The WMSC is currently reviewing this CAP to ensure the deliverables and intended outcomes of this CAP have been met.

WMSC staff observations:

The aviation industry has recognized the importance of crew resource management, which acknowledges that humans will make mistakes and other individuals must be comfortable identifying and communicating those errors and the person making the mistake – even if higher ranking – must be comfortable accepting that information and constructively moving forward. This requires team building, information sharing, problem solving, situational awareness, decision making, and dealing with automated systems (such as the systems in this scenario based on the switch being out of correspondence). The Federal Aviation Administration explains crew resource management training is comprised of initial awareness, recurrent practice and feedback, and continual reinforcement. Effectively implementing such open communication requires an effective management approach and Just Culture.

The WMSC appreciates the Assistant Operations Manager's acknowledgement of the incorrect instruction, and the interest in utilizing this investigation to improve safety moving forward.



Washington Metropolitan Area Transit Authority
Department of Safety (SAFE)
Office of Safety Investigations (OSI)

FINAL REPORT OF INVESTIGATION A&I E23360

Date of Event:	May 28, 2023
Type of Event:	Red Signal Overrun
Incident Time:	06:22 hours
Location:	D&G Junction, Track 2 Signal D98-52
Time and How received by SAFE:	06:54 hours
WMSC Notification Time:	07:30 hours
Responding Safety Officers:	None
Rail Vehicle:	Prime Mover (PM) 43
Injuries:	None
Damage:	None
Emergency Responders:	None
SMS I/A Number	20230528#108822MX

D&G Junction – Improper Rail Vehicle Movement

May 28, 2023

Table of Contents

Abbreviations and Acronyms	3
Executive Summary	4
Incident Site	4
Field Sketch/Schematics	5
Purpose and Scope	5
Investigative Methods	5
Investigation	6
Chronological Event Timeline	9
Office of Systems Maintenance, Office of Radio Communications (COMR)	12
ATC Engineering	12
Rail Operations Control Center (ROCC)	12
Office of Automatic Train Control Maintenance (ATCM)	13
Interview Findings	14
Radio RTC (Ops 2)	14
Equipment Operator of PM43	15
Weather	15
Related Rules and Procedures	15
Human Factors	15
Fatigue	15
Post-Incident Toxicology Testing	16
Findings	16
Immediate Mitigation to Prevent Recurrence	16
Probable Cause Statement	17
Recommended Corrective Actions	17
Appendices	18
Appendix A – Interview Summaries	18
Appendix B – ATCM Documents	20
ATCM Supervisor’s Report Excerpt (Redacted)	20
Appendix C – Engineering Report	21
Oracle Report (Redacted)	21
Appendix D – Why-Tree Analysis	21

Abbreviations and Acronyms

AMF	Advanced Mobile Flagger
AOM	Assistant Operations Manager
ARS	Audio Recording System
ATCM	Automatic Train Control Maintenance
CAP	Corrective Action Plan
CCTV	Closed-Circuit Television
CM	Chain Marker
MPH	Miles Per Hour
MSRPH	Metrorail Safety Rules and Procedures Handbook
NOAA	National Oceanic and Atmospheric Administration
PM	Prime Mover
RTC	Rail Traffic Controller
RTRA	Office of Rail Transportation
ROCC	Rail Operations Control Center
RWIC	Roadway Worker In Charge
SAFE	Department of Safety
SMS	Safety Measurement System
TRST	Office of Track and Structures
WMATA	Washington Metropolitan Area Transit Authority
WMSC	Washington Metrorail Safety Commission

Washington Metropolitan Area Transit Authority Department of Safety – Office of Safety Investigations

Incident Date: 05/28/2023 Time: 06:22 hours
Final Report – Improper Rail Vehicle Movement
E23360

Drafted By: SAFE 705 – 07/26/2023
Reviewed By: SAFE 707 – 07/26/2023
Approved By: SAFE 707 – 07/27/2023

Page 3

Executive Summary

**Note that all times listed are approximate and may contain minor variations due to differences between systems of record. **

On Sunday, May 28, 2023, at 05:54:11 hours, Switch 11A within the D&G Junction went out of correspondence. This resulted in red signals being set in the area. A maintenance team from the Office of Automatic Train Control Maintenance (ATCM) was dispatched to respond. While this crew was responding, Prime Mover (PM) 43 was moving from Downtown Largo Station to New Carrollton Station and approaching the D&G Junction.

At 06:15 hours, PM-43 was given permission to pass Red Signal D98-52 at the D&G Junction on track 2, by the Rail Operations Control Center (ROCC) Radio Rail Traffic Controller (RTC) prior to Switch 11 being clamped. At 06:22 hours, PM-43 crossed the insulated joint adjacent to signal D98-52 and stopped. PM-43 did not traverse the switch but did pass the signal prior to the switches being clamped. There were no damages or injuries involved.

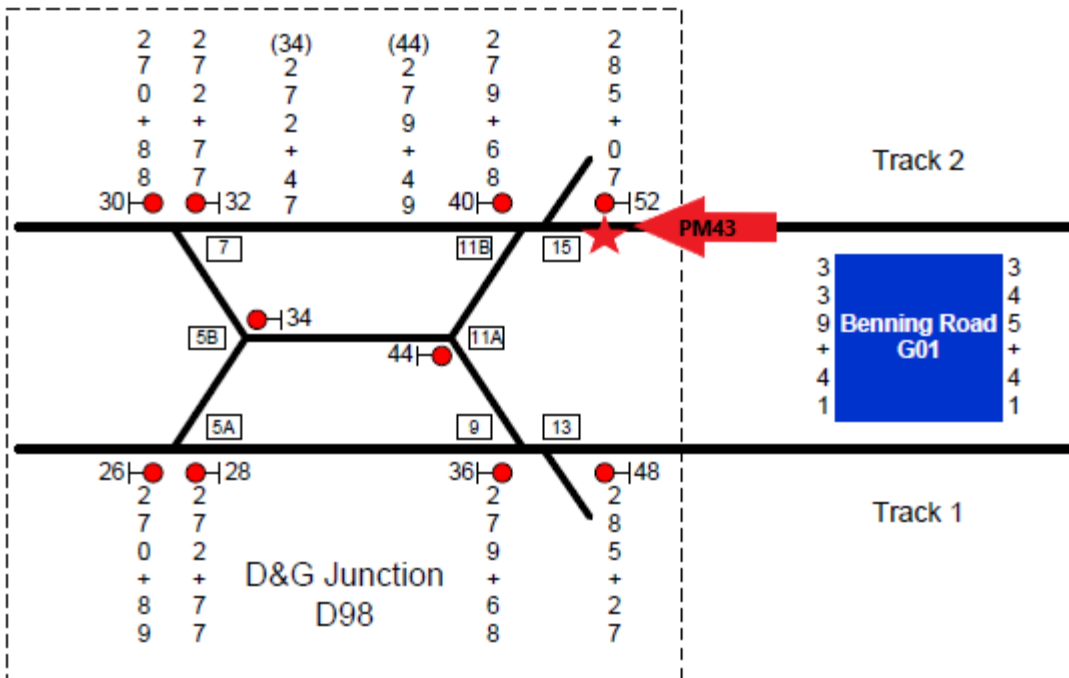
A review of the event revealed that the ROCC Assistant Operations Manager (AOM) instructed the Radio RTC to instruct PM-43 to move to Chain Marker (CM) D2 280+00, which is beyond signal D98-52, located at CM D2 285+07. This movement required PM-43 to pass D98-52 signal which was displaying a red aspect while switch 11 indicated as out of alignment.

The probable cause of the Improper Rail Vehicle Movement event on May 28, 2023, at the D&G Junction, was a miscommunication between the AOM and Radio RTC issuing permissions that resulted in the passing of red signal D98-52 by PM-43 prior to clamping switches.

Incident Site

D&G Junction, Track 2
CM D2 285+07
Red Signal D98-52

Field Sketch/Schematics



The above depiction is not to scale.

Purpose and Scope

The purpose of this accident investigation and candid self-evaluation is to collect and analyze available facts, determine the probable cause(s) of the incident, identify contributing factors, and make recommendations to prevent a recurrence.

Investigative Methods

The investigative methodologies included the following:

- Formal Interviews – SAFE interviewed three individuals as part of this investigation. The interviews included persons present at, during, and after the incident, those directly involved in the response process, and representatives from the Washington Metrorail Safety Commission (WMSC). SAFE interviewed the following individual:
 - Equipment Operator (PM-43)
 - ROCC Assistant Operations Manager
 - Radio RTC
- Informal Interviews – Collected through conversations with individuals during the investigation to provide background and supporting information. Written statements were reviewed from personnel present during the event.
- Documentation Review – A collection of relevant work history information and process documentation contained in Metro systems of record. These records include:
 - Metrorail Safety Rules and Procedures Handbook (MSRPH)
 - National Oceanic and Atmospheric Administration (NOAA)
 - RTC Training Records

- RTC Certifications
 - RTC 30-Day work history review
 - AOM Training Records
 - AOM Certifications
 - AOM 30-Day work history review
 - AMF/LSC Roadway Access Log
 - ATCM Supervisor's Report
- System Data Recording Review – A collection of Metro Data Recording Systems information. This data includes:
 - Audio Recording System (ARS) playback, including OPS 3 Radio
 - Advanced Information Management System (AIMS)
 - Oracle Report

Investigation

At 05:45 hours, Oracle Data revealed that switch 11 indicated as out of correspondence. As a result, routes between signals D98-40, 42, and 52 were not able to be set. An ATCM crew was dispatched at 05:57 hours to respond and troubleshoot.

At 06:15 hours, the Equipment Operator of PM-43 advised the Radio RTC that all personnel were clear, and it was safe to move towards CM D2 280+00. The Radio RTC acknowledged and advised the Equipment Operator that they had an absolute block to CM D2 280+00, D98-52 signal was red, and that they had permission to pass after verifying switch position and at speeds no

greater than 5 Miles Per Hour (MPH).

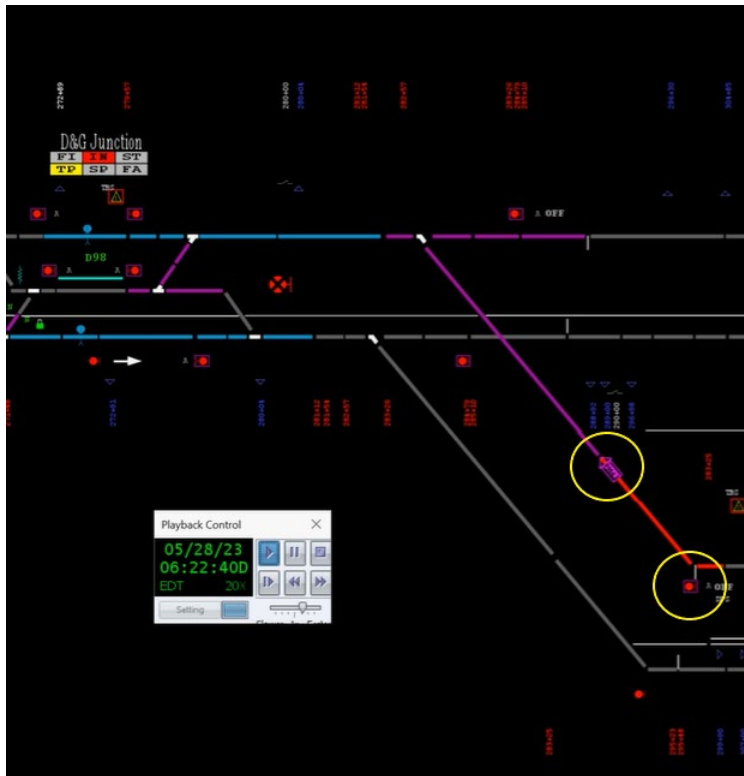


Figure 1 - AIMS depicting PM-43 passing the D98-52 Signal at the D&G Junction, track 2.

At 06:19 hours, the ATCM Roadway Worker In-Charge (RWIC) requested permission to enter the roadway at the D&G Junction to troubleshoot switch 11, which was out of correspondence, intending to enter the roadway at CM 283+00 on all three tracks using Exclusive Track Occupancy Local Signal Control (ETO-LSC). At 06:21 hours, the ATCM RWIC advised ROCC that they had Local Control. The Radio RTC acknowledged and advised the ATCM RWIC to stand by and stand clear while they attempted to move PM-43 from the area.

At 06:22 hours, the Radio RTC instructed the Equipment Operator to stop. The Radio RTC advised the ATCM RWIC that they had permission to enter the roadway to clamp switch 11 in a normal position and instructed that switch 7 be clamped in a reverse position for PM-43 to traverse the switch as ATCM was troubleshooting the interlocking.

At 06:24 hours, the AOM contacted the Button RTC and inquired why PM-43 was able to pass D98-52 red without the switches being clamped. The Button RTC advised the AOM that they, the AOM, advised the Radio RTC to instruct PM-43 to pass D98-52 red.

At 06:29 hours, the ATCM RWIC advised the Radio RTC that switch 11 was clamped in a normal position. At 06:31 hours, the Radio RTC requested that the ATCM RWIC clamp switch 7 in a normal position for a straight through move.

At the same time, the AOM contacted the ROCC Operations Manager (OM) and advised that switch 11 was back in service and was clamped at the D&G Junction. The AOM further advised that they were unable to give PM-43 a lunar to pass D98-52. The OM advised the AOM not to move anything further.

At 06:33 hours, the OM contacted ROCC Management and advised them of the incident.

At 06:35 hours, the ATCM RWIC advised the Radio RTC that switches 7 and 11 were clamped in a normal position. At 06:38 hours, the ATCM RWIC advised the Radio RTC that switch 11 was clamped in a normal position and switch 15 was clamped in a reverse position, allowing PM-43 safe movement through the area. The Radio RTC advised the ATCM RWIC to stand by and stand clear.

At 06:40 hours, the Radio RTC announced to all personnel that ATCM personnel were in the roadway at D&G Junction.

At 06:42 hours, the ATCM RWIC advised that PM-43's route was set from D98-36 to D98-48. The ATCM RWIC advised that while D98-36 was still red, a lunar would appear "momentarily."

At 06:45 hours, the Radio RTC advised the Equipment Operator that they had an absolute block to Eastern Market Station from D06-06 Signal. They further advised that switches 7,11, and 15 had been clamped and to proceed at no greater than 5 MPH over switches.

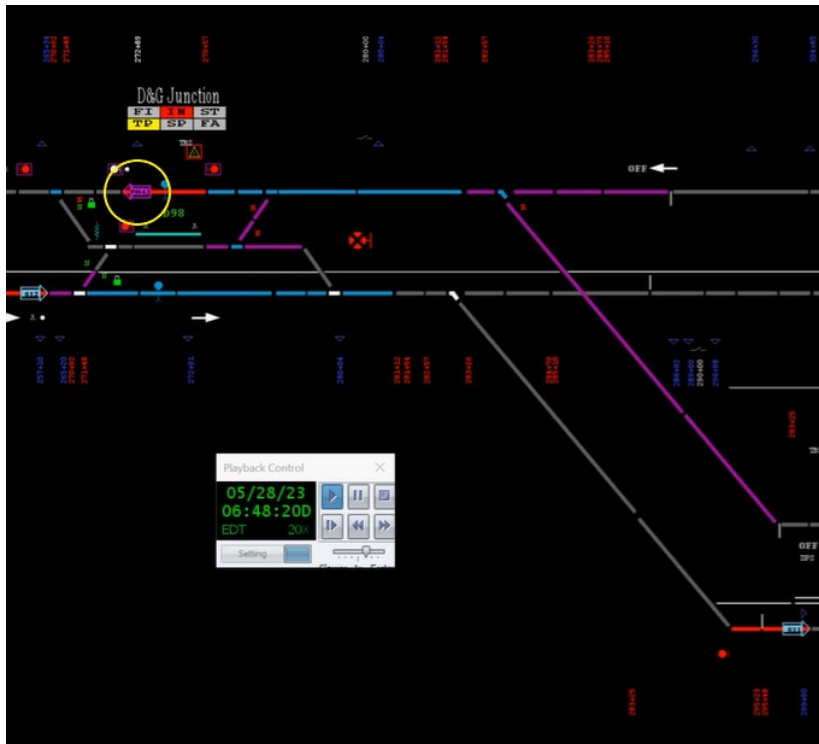


Figure 2 - AIMS depicting PM-43 clearing the D&G Junction.

At 06:51 hours, the Radio RTC requested that the ATCM RWIC remove the automatic on D98-32 and unclamp switch 15. The ATCM RWIC confirmed that switch 15 was unclamped.

At 07:09 hours, the OM advised AOM #2 that PM-43 could be moved to New Carrollton Yard. At 07:10 hours, the Radio RTC advised the Equipment Operator that they had an absolute block to cross from track 2 to track 1 at Eastern Market Station interlocking to Stadium-Armory Station, track 1.

At 07:16 hours, the Radio RTC advised the Equipment Operator that they had an absolute block to Cheverly Station, track 1.

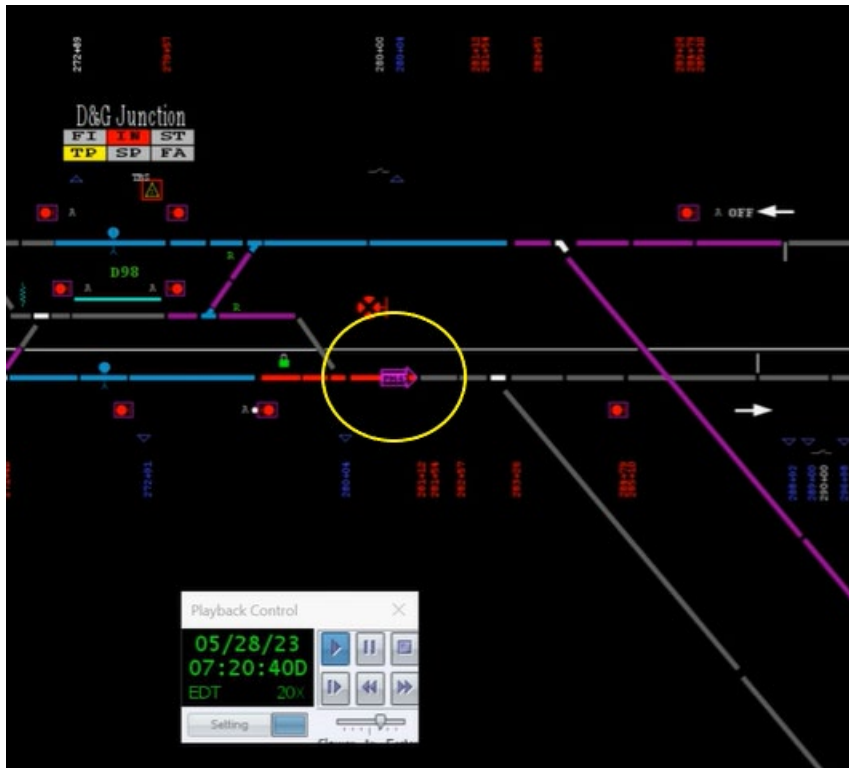


Figure 3 - AIMS depicting PM43 clearing the D&G Junction towards New Carrollton Station.

At 07:21 hours, the Operator of PM-43 advised the Radio RTC that they were clear of the D&G Junction.

Chronological Event Timeline

A review of ARS playback, i.e., phone and radio communications, revealed the following timeline:

Time	Description
06:00:42 hours	Radio RTC: Advised the Operator of PM43 to cross from track 2 to track 1 at Addison Road Station with an absolute block Capitol Heights track 1. Operator PM43: Acknowledged and repeated back. [Radio, OPS 2]
06:05:04 hours	Radio RTC: Advised the Operator of PM43 that the absolute block has changed to Addison Road Station, track 2, and that G03 Signal 08 will be red and to standby for realignment. Operator PM43: Acknowledged and repeated back. [Radio, OPS 2]
06:07:26 hours	Radio RTC: Attempted to contact PM43 multiple times to negative effect. [Radio, OPS 2]
06:08:18 hours	Radio RTC: Advised the Operator of PM43 that the absolute block has changed to CM D2 280+00. Operator PM43: Acknowledged and repeated back. [Radio, OPS 2]
06:12:14 hours	Operator PM43: Advised the Radio RTC that they were holding at Capitol Heights Station, track 2, to inspect something. Radio RTC: Acknowledged and repeated back. [Radio, OPS 2]

Time	Description
06:15:08 hours	<p><u>Operator PM43</u>: Advised the Radio RTC that all personnel were clear, and it was safe to move towards CM D2 280+00</p> <p><u>Radio RTC</u>: Acknowledged, advised Operator PM43 that they had an absolute block down to CM D2 280+00, D98-52 Signal is red, and they had permission to pass, verifying switch position at speeds no greater than 5 MPH.</p> <p><u>Operator PM43</u>: Acknowledged and repeated back.</p> <p>[Radio, OPS 2]</p>
06:19:05 hours	<p><u>ATCM RWIC</u>: Requested permission to enter the roadway at the D&G Junction to address Switch 11 which was out of correspondence and their intention to enter the roadway at CM 283+00 on all three tracks using ETO through Local Control.</p> <p><u>Radio RTC</u>: Acknowledged, repeated back.</p> <p>[Radio, OPS 2]</p>
06:21:21 hours	<p><u>ATCM RWIC</u>: Advised the Radio RTC that their team had Local Control.</p> <p><u>Radio RTC</u>: Acknowledged, and advised ATCM RWIC to stand by and stand clear while they attempted to remove PM43 from the site.</p> <p>[Radio, OPS 2]</p>
06:22:11 hours	<p><u>Radio RTC</u>: Requested Operator of PM43 stop where they are.</p> <p><u>Operator PM43</u>: Acknowledged and repeated back.</p> <p>[Radio, OPS 2]</p>
06:22:56 hours	<p><u>Radio RTC</u>: Advised the ATCM RWIC had permission to enter the roadway to clamp Switch 11 in a normal configuration and further required Switch 7 to be clamped in a reverse configuration while they move PM43 through the work zone.</p> <p><u>ATCM RWIC</u>: Acknowledged and repeated back.</p> <p>[Radio, OPS 2]</p>
06:24:08 hours	<p>The AOM contacted the Buttons RTC of Ops 2 and enquired why PM43 was able to pass Red Signal 52 without switches clamped. The Buttons RTC advised the AOM that they, the AOM, allowed the Radio RTC of OPS 2 to permit PM43 to continue past Red Signal 52.</p> <p>[Phone, Rail 3]</p>
06:29:38 hours	<p><u>ATCM RWIC</u>: Advised the Radio RTC that Switch 11 was clamped normal.</p> <p><u>Radio RTC</u>: Acknowledged and repeated back.</p> <p>[Radio, OPS 2]</p>
06:31:04 hours	<p><u>Radio RTC</u>: Requested the ATCM RWIC to clamp Switch 7 in a normal configuration.</p> <p><u>ATCM RWIC</u>: Acknowledged and repeated back.</p> <p>[Radio, OPS 2]</p>
06:31:06 hours	<p>The AOM notified the OM that switch 11 is back in service and was clamped at the D&G Junction. The AOM further advised that they were unable to give PM43 a lunar to pass Red Signal 52. The OM advised the AOM not to move anything further.</p> <p>[Phone, Rail 3]</p>
06:33:14 hours	<p>The OM contacted ROCC Executive Leadership and advised them of the incident.</p> <p>[Phone, Rail 1]</p>
06:35:40 hours	<p><u>ATCM RWIC</u>: Advised the Radio RTC that Switches 7 and 11 were clamped normal.</p> <p><u>Radio RTC</u>: Acknowledged and repeated back.</p> <p>[Radio, OPS 2]</p>

Time	Description
06:38:59 hours	<u>ATCM RWIC</u> : Advised the Radio RTC that Switch 11 was clamped in normal, Switch 15 in reverse and that PM43 could be moved. <u>Radio RTC</u> : Acknowledged, repeated back, and advised to stand by and clear. [Radio, OPS 2]
06:40:39 hours	<u>Radio RTC</u> : Announced to all personnel that ATCM personnel were in the roadway at D&G Junction. [Radio, OPS 2]
06:42:15 hours	<u>Radio RTC</u> : Requested from the ATCM RWIC if it was safe to move. <u>ATCM RWIC</u> : Advised the Operator that it was safe to move, and that the route was set from Signal D98-36 to Signal D98-48 <u>Radio RTC</u> : Acknowledged and advised that Red Signal 36 was still red. <u>ATCM RWIC</u> : Acknowledged, advised that the Lunar would appear “momentarily.” [Radio, OPS 2]
06:45:21 hours	<u>Radio RTC</u> : Advised the Operator of PM43 that they had an absolute block at Eastern Market Station, track 2 and that D06 interlocking was clamped. Further, D98 Switches 7,11, and 15 had been clamped and to proceed at no greater than 5 MPH past switches. <u>Operator PM43</u> : Acknowledged and repeated back. <u>Radio RTC</u> : Advised the Operator of PM43 that they had an absolute block is Eastern Market Station, track 2 from D06-06 Signal. Further, D98 Switches 7,11, and 15 had been clamped and to proceed at no greater than 5 MPH past switches. <u>Operator PM43</u> : Acknowledged and repeated back. <u>Radio RTC</u> : Requested the Operator announce when they had passed Red Signal 52. <u>Operator PM43</u> : Acknowledged and stated that they were clear of Red Signal 52. [Radio, OPS 2]
06:51:53 hours	<u>Radio RTC</u> : Requested ATCM RWIC remove the automatic at Red Signal 32 and unclamp Switch 15. <u>ATCM RWIC</u> : Acknowledged and advised that Switch 15 is unclamped. <u>Radio RTC</u> : Acknowledged and repeated back. [Radio, OPS 2]
07:00:54 hours	<u>ATCM RWIC</u> : Requested permission from the Radio RTC to troubleshoot Switch 11 <u>Radio RTC</u> : Acknowledged and repeated back. [Radio, OPS 2]
07:09:25 hours	The OM advised AOM #2 that PM43 could be moved to New Carrollton Yard. [Phone, Rail 1]
07:10:39 hours	<u>Radio RTC</u> : Advised the Operator of PM43 that they had an absolute block to cross from track 2 to track 1 at Eastern Market Station interlocking to Stadium-Armory Station, track 1. <u>Operator PM43</u> : Acknowledged and repeated back. [Radio, OPS 2]
07:15:37 hours	<u>Radio RTC</u> : Requested ATCM RWIC grant access between Red Signals 26 and 28. <u>ATCM RWIC</u> : Acknowledged and repeated back. [Radio, OPS 2]
07:16:06 hours	<u>Radio RTC</u> : Advised the Operator of PM43 that they had an absolute block to Cheverly Station, track 1.

Time	Description
	Operator PM43: Acknowledged and repeated back. [Radio, OPS 2]
07:21:10 hours	Operator PM43: Advised the Radio RTC that they are clear of the D&G Junction. Radio RTC: Acknowledged and repeated back. [Radio, OPS 2]

Note: Times above may vary from other systems' timelines based on clock settings.

Office of Systems Maintenance, Office of Radio Communications (COMR)

No system-related communications issues were detected by COMR as of the writing of this report (Maximo # 18029536).

ATC Engineering

Adopted from the Oracle Report

“On the date in question, Switch 11 at D98/D&G Junction was out of correspondence and signals associated with that switch (Signals 40, 42, and 52) would NEVER clear and display a Lunar white aspect. This switch was restored to operation by ATCM personnel at 07.02 that day. ATCM personnel did have control of the local control panel at this location at 06.20.52. The unit PM43 did overrun Signal 52 while it was RED.”

TIME	LOCATION	STATUS/ CONTROL	DESCRIPTION	COMMENTS
05.45.11	D98	Status	D98 Switch 11 Out of Correspondence	Switch indicates Out of Correspondence Neither Normal nor reverse position. Routes across accompanying signals 40,42, and 52 are impossible to clear.
05.45.25	D98	Control	D98 Switch 11 Set Call Reverse	ROCC attempts to throw switch 11 Reverse by Aux Call
05.45.39	D98	Control	D98 Switch 11 Set Call Normal	ROCC attempts to throw switch 11 Normal by Aux Call
06.10.42	D98	Status	D98 Switch 11 Out of Correspondence	ROCC attempts to throw switch 11 Reverse by Aux Call
06.10.42	D98	Control	D98 Switch 11 Set Call Reverse	ROCC attempts to throw switch 11 Normal by Aux Call
06.20.52	D98	Status	Interlocking Control Local	ATC personnel in the room have taken control of the panel
06.22.16	D98	Status	D98-15BT Occupied	PM 43 crosses Insulated Joint located adjacent to signal 52
06.46.21	D98	Status	D98-15AAT Occupied	PM 43 continues towards Switch 11
06.46.48	D98	Status	D98-D2-281 Occupied	PM 43 clears Switch 11

Note: Times above may vary from other systems' timelines based on clock settings.

Rail Operations Control Center (ROCC)

Adopted from OM's Report:

“Upon shift change, switch 11 was showing out of correspondence at the D&G Junction. ATC was dispatched and en route. PM43 was between Morgan Blvd and Downtown Largo, track #2 and needed to transport to New Carrollton Yard for storage.

Due to switch 11 being out of correspondence, ROCC was unable to establish routing at D98-52 signal. Per written statements, AOM [redacted] instructed RTC [redacted] to give PM43 an absolute block to chain marker D2-280+00 and allow the TRST Supervisor to clamp switch 11. The problem is chain marker D2-280 is past D98-52 signal.

PM43 passed D98-52 red, ROCC's permission. No switches were clamped at the time the initial block was given. PM43 did not go over any unclamped switches but the unit did pass D98-52 signal red.

The ROCC Incident Report further narrowed down Switch 11A as being out of correspondence."

Adopted from Radio RTC's Statement:

"Switch-11 was out of correspondence at D98 track 2. The original plan was to have a track supervisor aboard PM 43 to crank and clamp switch-11 in a normal until ATC personnel arrived. I intended to give PM 43 a block to D98-52 Signal Red and have the track supervisor walk up the hill under foul time protection to crank and clamp switch-11.

AOM [redacted] stated why don't you give him a block to a chain-marker that's closer. His suggested chain-marker was D2-280+00. With the permission of my AOM I gave PM 43 an Absolute block to chain-marker D2 280+00 with permission to pass D98-52 signal red verifying the switch position with speeds no greater than 5mph over the switch.

As PM 43 approached to signal D98-52, the ATCM RWIC arrived at D98 and made his request to go roadway. PM 43 was instructed to stop his unit, however he had already passed D98-52 signal red and was holding at approximately chain-marker D2-290+00. I was called to the AOM desk and now I'm submitting this statement for the record."

Adopted from AOM's Statement:

"On the morning of May 28, 2023, upon coming on duty at 0600, switch 11 was out of correspondence at the D&G Junction (D98). Shortly after assuming my duties, I had a conversation with RTC [redacted] who was working the radio on OPS 2. I recommended that unit PM 43 could get a block up to chain marker D2-280+00 for purposes of personnel aboard to clamp switch 11.

At the time of the discussion PM 43 was leaving their work location around Morgan Boulevard on track two and I did not realize that the RTC would be unable to set a route at D98-52 signal, in order for the unit to get to chain marker D2 280+00.

I should have realized that, and I take accountability in giving the RTC a bad instruction. With that being said, at no point did I tell RTC [redacted] that it was ok for the unit to pass any red signals. If he realized that a route could not be set at D98-52 signal, he should have mentioned that and I would have corrected myself."

Office of Automatic Train Control Maintenance (ATCM)

Adopted from the ATCM Supervisor's report:

"D98 D&G JUNCTION SWCH ATC 8673250, D98, OPS #2 REPORTS SWICH 11 OUT OF CORRESPONDENCE NORMAL, 0-minute delay accessed, the maintenance team was dispatched at 05:57Hrs and arrived at 06:09Hrs, our team was placed on standby until ROCC was finished making moves.

Once wayside our team exercised the switch a minor adjustment was made on switch 11A, the team completed the necessary inspections, and safety certification tests to restore the switch to service.

The corrective maintenance ticket was left open for observation for 24hrs then completed and closed.

Incident Response Timeline

Time: 05/28/2023 06:09:21,

Summary: ATC UNIT #2397 ON SCENE TROUBLE SHOOTING

Time: 05/28/2023 05:56:00,

Summary: ATC ASST. SUPERINTENDENT NOTIFIED BY AGS

Time: 05/28/2023 05:48:00,

Summary: MOC ATTEMPTED TO CONTACT ATC.

Time: 05/28/2023 05:46:00,

Summary: ROCC/OPS 2 REPORTED SWITCH 11 OUT OF CORRESPONDENCE IN NORMAL.”

Interview Findings

As part of the investigation launched into the event, SAFE interviewed three employees. The interviews identified the following key findings associated with this event. Findings detailed below include reported information from involved personnel and may conflict with other data sources contained in the report.

Radio RTC (Ops 2)

- The Radio RTC stated that they were assigned as the Radio RTC for Ops 2 at the time of the incident.
- The Radio RTC advised that Switch 11A was out of correspondence prior to them coming on to shift. The Radio RTC stated that the previous shift had identified the misaligned switch and had advised the Radio RTC's shift of the problem.
- The Radio RTC stated they had been advised that PM43 had a TRST Supervisor aboard that would be able to re-align Switch 11A.
- The Radio RTC stated they provided a block to Red Signal 52 initially, however, they were advised by the AOM to move PM43 closer to Switch 11A. The Radio RTC stated the AOM guided their actions while observing the screen and identifying Red Signal 52.
- The Radio RTC stated that they then gave permission for PM43 to traverse beyond Red Signal 52. The Radio RTC stated they then stopped PM43 within the vicinity of Switch 15. The Radio RTC stated they were then told to complete a statement and had no further involvement in the incident.
- The Radio RTC stated they were not removed from service post-incident.

AOM

- The AOM stated on the morning of the incident, they were briefed by the OM at approximately 05:50 hours. The AOM stated shift-change was at 06:00 hours during which they were advised that Switch 11 was out of alignment. The AOM stated a Supervisor from TRST had been dispatched in order to realign Switch 11.

- During their walkthrough, the AOM advised that they received a question from the Radio RTC in reference to the movement of PM43. The AOM stated they and the Radio RTC discussed sending PM43 to CM D2 280+00 in order to clamp Switch 11.
- The AOM stated that they didn't initially sight Red Signal 52 on the map, however, advised that they did not advise the Radio RTC to disregard the Red Signal.
- The AOM stated ATCM was not utilized to clamp the switch, as the TRST PM43 was already on scene, and ATCM typically gives very generalized timelines for appearing on scene.
- The AOM stated that by the time they had realized that the Radio RTC had allowed PM43 to pass Red Signal 52, it was too late. The AOM stated the OM questioned them post-incident about their involvement and took responsibility for their part in advising the Radio RTC of an incorrect course of action.
- The AOM stated that the Radio RTC should have caught the incident prior to allowing PM43 past Red Signal 52.
- The AOM stated they were removed from service, for post-incident testing and have since returned to their duties within the ROCC.

Equipment Operator of PM43

- The Operator stated they were assigned to operate PM43 in order to transport lengths of track in support of a TRST Team renewing rail at the D&G Junction.
- The Operator stated that just prior to the incident, they were given a lead by the ROCC to move from Benning Road Station, track 2 and clear Red Signal 52 through to Red Signal 44.
- The Operator stated they observed the Red Signal 52 and had heard the ROCC attempting to make contact and returned their communications several times during the move, however, the ROCC was not receiving the replies.
- The Operator stated they then heard the Radio RTC command them to stop PM43 to which they complied. The Operator stated PM43 came to rest with approximately one third of the length of the vehicle beyond Red Signal 52.
- The Operator stated they were then commanded to move PM43 to Eastern Market Station, change tracks and head back to New Carrollton Yard via way of track 1.
- The Operator stated they were not removed from service as a result of the incident.
- The Operator suggested the Radio RTC protocol for airing time-urgent information should be to air the required information, regardless of whether a receipt of said information was heard, rather than attempting to establish communications.

Weather

On May 28, 2023, at the time of the incident, NOAA recorded the average temperature as 67° F, with complete cloud cover, winds of 9.3 mph, and 55% humidity. Weather was not a contributing factor in this incident (Weather source: NOAA) – Location: Washington, DC.

Related Rules and Procedures

- MSRP SOP 15 – Absolute Block/Permissive Block
- MSRP SOP 35 – Hand Cranking and Clamping of Switches

Human Factors

Fatigue

Signs and Symptoms of Fatigue

Conditions at the time of the incident were evaluated to distinguish whether evidence of fatigue was present. No video was available in order to observe fatigue factors. The AOM reported feeling fully alert at the time of the incident and reported experiencing no symptoms of fatigue in the time leading up to the incident.

Fatigue Risk

The AOM worked day shifts (06:00 – 14:00 hours) in the days leading up to the incident. The AOM reported 7.5 hours of sleep in the last sleep period preceding the incident and was awake for 1.75 hours at the time of the incident. The AOM was off duty for a calculated total of 15.75 hours, which provided the opportunity for 7-9 hours of sleep. The employee reported usual workday sleep durations of 8 hours and no issues with sleep.

Incident data was evaluated for fatigue risk factors. There were no major risk factors for fatigue identified. The incident time of day (06:15 hours) does not suggest an increased risk of fatigue-related impairment. The Radio RTC worked day shifts (05:45 – 14:00 hours) in the days leading up to the incident. The Radio RTC reported 5.5 hours of sleep in the last sleep period preceding the incident and was awake for 1.5 hours at the time of the incident. The Radio RTC was off duty for a calculated total of 16.25 hours, which provided the opportunity for 7-9 hours of sleep. The employee reported usual workday sleep durations of 6.5 hours and no issues with sleep.

Post-Incident Toxicology Testing

WMATA's Drug and Alcohol Program determined that the AOM complied with the Drug and Alcohol Policy and Testing Program 7.7.3/6.

Findings

- PM43 traversed passed Red Signal at D98-52 with permission from the Radio RTC on Ops 2.
- The Radio RTC stated they intended to give PM43 an absolute block and have a TRST Supervisor clamp Switch 11 under Foul Time Protection.
- The Radio RTC stated they gave PM43 an Absolute Block to CM D2 280+00, passing Red Signal 52 under instruction from the AOM.
- The AOM advised the Radio RTC to give PM43 a permissive block up to CM D2 280+00 in order for personnel to clamp Switch 11 without realizing that the Radio RTC was unable to set a route at Red Signal 52.
- Communications issues between the Radio RTC and the Operator of PM43 did not allow the vehicle to stop prior to passing Red Signal 52. COMR were unable to replicate or detect communications issues in the area.
- The Operator of PM43 stated the vehicle came to rest approximately one third of the length of the vehicle beyond Red Signal 52.
- The ROCC OM's Report and the Oracle Report determined that Switch 11 was out of correspondence prior to 05:45 hours.
- The ATCM Report confirmed that ATCM personnel were standing by the D&G Junction at the time of the incident and resolved the issue at 07:02 hours.

Immediate Mitigation to Prevent Recurrence

- PM43 was removed from service.

- The AOM was removed from service.

Probable Cause Statement

The probable cause of the Improper Rail Vehicle Movement event on May 28, 2023, at the D&G Junction, was a miscommunication between the AOM and Radio RTC issuing permissions that resulted in the passing of Red Signal 52 by PM43 prior to clamping switches.

Recommended Corrective Actions

Corrective Action Code	Description	Responsible Party	Estimated Completion Date
108822MX_SAFEC APS_ROCC_001	(RC-1) Implement information in Rollcall Safety Briefing/Big Board Announcement, empowering RTCs to speak up if they identify a problem and prioritize airing critical information (e.g. Stop Movement) while attempting to make contact with the intended recipient.	ROCC SRC	Completed
108822MX_SAFEC APS_ROCC_002	Re-instruction on permissions issued for passing Red Signals for the AOM and RTC.	ROCC SRC	Completed

Appendices

Appendix A – Interview Summaries

The below narratives summarize the incident and represent the statements made by the involved individual. As such, times and details may present a conflict with the data contained in systems of record.

Radio RTC (OPS 2)

The Radio RTC is a WMATA Employee with 5 years of service, with 5 years' experience as a Rail Traffic Controller. The Radio RTC holds an RWP Level 4 that expires on 10/31/2023.

The Radio RTC stated that they were assigned as the Radio RTC for Ops 2 at the time of the incident.

The Radio RTC advised that Switch 11A was out of correspondence prior to them coming on to shift. The Radio RTC stated that the previous shift had identified the misaligned switch and had advised the Radio RTC's shift of the problem.

The Radio RTC stated they had been advised that PM43 had a TRST Supervisor aboard that would be able to re-align Switch 11A.

The Radio RTC stated they provided a block to Red Signal 52 initially, however, they were advised by the AOM to move PM43 closer to Switch 11A. The Radio RTC stated that the AOM guided their actions while observing the screen and identifying Red Signal 52.

The Radio RTC stated that they then gave permission for PM43 to traverse beyond Red Signal 52. The Radio RTC stated they then stopped PM43 within the vicinity of Switch 15. The Radio RTC stated they were then told to complete a statement and had no further involvement in the incident.

The Radio RTC stated they were not removed from service post-incident.

AOM

The AOM is a WMATA Employee with 10.5 years of service, with 1.5 years of experience as an Assistant Operations Manager. The AOM holds an RWP Level 2 that expires on 04/30/2024.

The AOM stated on the morning of the incident, they were briefed by the OM at approximately 05:50 hours. The AOM stated shift-change was at 06:00 hours during which they were advised that Switch 11 was out of alignment. The AOM stated a Supervisor from TRST had been dispatched in order to realign Switch 11.

During their walkthrough, the AOM advised that they received a question from the Radio RTC in reference to the movement of PM43. The AOM stated they and the Radio RTC discussed sending PM43 to CM D2 280+00 in order to clamp Switch 11.

The AOM stated that they didn't initially sight Red Signal 52, however, advised that they did not advise the Radio RTC to disregard the Red Signal.

The AOM stated ATCM was not utilized to clamp the switch, as the TRST PM43 was already on scene, and ATCM typically gives very generalized timelines for appearing on scene.

The AOM stated that by the time they had realized that the Radio RTC had allowed PM43 to pass Red Signal 52, it was too late. The AOM stated the OM questioned them post-incident about their involvement, and took responsibility for their part in advising the Radio RTC of an incorrect course of action.

The AOM stated that the Radio RTC should have caught the incident prior to allowing PM43 past Red Signal 52.

The AOM stated they were removed from service, for post-incident testing and have since returned to their duties within the ROCC.

Operator of PM43

The Operator is a WMATA Employee with 10 years of service, all of which has been in the operation of equipment. The Operator holds an RWP Level 2 that expires on 12/31/2023.

The Operator stated they were assigned to operate PM43 in order to transport lengths of track in support of a TRST Team renewing rail at the D&G Junction.

The Operator stated that just prior to the incident, they were given a lead by the ROCC to move from Benning Road Station, track 2 and clear Red Signal 52 through to Red Signal 44.

The Operator stated they observed the Red Signal 52 and had heard the ROCC attempting to make contact and returned their communications several times during the move, however, the ROCC was not receiving the replies.

The Operator stated they then heard the Radio RTC command them to stop PM43 to which they complied. The Operator stated PM43 came to rest with approximately one third of the vehicle beyond Red Signal 52.

The Operator stated they were then commanded to move PM43 to Eastern Market Station, change tracks and head back to New Carrollton Yard via way of track 1.

The Operator stated they were not removed from service as a result of the incident.

The Operator suggested the Radio RTC protocol for airing time-urgent information should be to air the required information, regardless of whether a receipt of said information was heard, rather than attempting to establish communications.

Appendix B – ATCM Documents

ATCM Supervisor's Report Excerpt (Redacted)

5/30/2023 Morning VP and SVP Incident Report

D98 D&G JUNCTI SWCH ATC 8673250, D98, OPS #2 REPORTS SWICH 11 OUT OF CORRESPONDENCE NORMAL, 0-minute delay accessed, the maintenance team was dispatched at 05:57Hrs and arrived at 06:09Hrs, our team was placed on standby until ROCC was finished making moves. Once wayside our team exercised the switch a minor adjustment was made on switch 11A, the team completed the necessary inspections, and safety certification tests to restore the switch to service. The corrective maintenance ticket was left open for observation for 24hrs then completed and closed.

Incident Response Timeline

Time: 05/28/2023 06:09:21, Summary: ATC UNIT # [REDACTED] ON SCENE TROUBLE SHOOTING
Time: 05/28/2023 05:56:00, Summary: ATC ASST. SUPERINTENDENT NOTIFIED BY AGS
Time: 05/28/2023 05:48:00, Summary: MOC ATTEMPTED TO CONTACT ATC.
Time: 05/28/2023 05:46:00, Summary: ROCC/OPS 2 REPORTED SWITCH 11 OUT OF CORRESPONDENCE IN NORMAL.

D09 IDWA ATC 8673305 D09 IDW ALARM TRACK 2, 15-minute delay accessed, the maintenance team was dispatched and responded to the location. Upon arrival, the team found Track 2 Zone 1 in alarm, the team was able to manually reset the alarm to clear the issue. The team stayed on site to keep the system under observation for the rest of the shift. The corrective maintenance ticket was left open for observation for 24hrs then completed and closed.

Incident Response Timeline

Time: 05/28/2023 15:17:00, Summary: ATC UNIT # [REDACTED] RESET IDW; ALARM RESOLVED.
Time: 05/28/2023 15:08:00, Summary: ATC UNIT # [REDACTED] ON SITE TO TROUBLE SHOOT
Time: 05/28/2023 15:01:00, Summary: NOTIFIED ATC SUPV. # [REDACTED] ET 15 MIN.S
Time: 05/28/2023 14:55:00, Summary: D09 IDW ALARM TRACK 2

E10 GREENBELT IDWA ATC 8673365 E10, IDW ALARM ACTIVE FOR TRACK 2 ZONE 1, 0-minute delay accessed, the maintenance team was dispatched and responded to the location. Upon arrival, the team found Track 2 Zone 1 in alarm, the team was able to manually reset the alarm to clear the issue. The team stayed on site to keep the system under observation for the rest of the shift. The corrective maintenance ticket was left open for observation for 24hrs then completed and closed.

Incident Response Timeline


Time: 05/29/2023 02:18:25, Summary: ATC 2212 RESET THE IDW AND CLEARED THE ALARM.
Time: 05/29/2023 01:47:00, Summary: MOC NOTIFIED ATC SUPERVISOR [REDACTED]
Time: 05/29/2023 01:43:00, Summary: ROCC/OPS 3 REPORTED IDW ALARM ACTIVE FOR TRACK 2 ZONE 1.

Interlockings Out of Service

- A10 switches 1 & 3 with an estimated return to service 6/1/2023
 - Signals Maintenance replaced the point detector rod on 5/29 MIDS, with remaining damaged parts still needing replacement. Work will continue on 5/30 MIDS

Document 1 – ATCM Supervisor's Report Excerpt Page 1 of 1. Red Box applied to indicate relevant data.

Appendix C – Engineering Report
Oracle Report (Redacted)

	Washington Metropolitan Area Transit Authority ENGA-ATCE			Request:	[REDACTED]			
				Date:	06/05/2023			
				From:	[REDACTED]			
				To:	[REDACTED]			
Location : D98	Time of Incident Reported: - 06.15	Date of incident: 05/28/2023	Train ID	PM43				
Description:	Improper Rail Vehicle Movement – PM 43		Interlocking Control: [LOCAL]					
Requested Analysis: Investigate Incident								
INITIAL STATE AS OF: 05.45.00								
Name	STATE	AUTO	NAME	STATE	AUTO	NAME	STATE	AUTO
Interlocking Control	[Central]	-	D98-52	STOP	[N]	D98-15BBT	VACANT	-
Switch D98-11	[OOC]	-						
RECORDED EVENT DATA								
TIME	LOCATION	STATUS/ CONTROL	DESCRIPTION	COMMENTS				
05.45.11	D98	Status	D98 Switch 11 Out of Correspondence	Switch indicates Out of Correspondence Neither Normal nor reverse position. Routes across accompanying signals 40,42, and 52 are impossible to clear.				
05.45.25	D98	Control	D98 Switch 11 Set Call Reverse	ROCC attempts to throw switch 11 Reverse by Aux Call				
05.45.39	D98	Control	D98 Switch 11 Set Call Normal	ROCC attempts to throw switch 11 Normal by Aux Call				
06.10.42	D98	Status	D98 Switch 11 Out of Correspondence	ROCC attempts to throw switch 11 Reverse by Aux Call				
06.10.42	D98	Control	D98 Switch 11 Set Call Reverse	ROCC attempts to throw switch 11 Normal by Aux Call				
06.20.52	D98	Status	Interlocking Control Local	ATC personnel in the room have taken control of the panel				
06.22.16	D98	Status	D98-15BT Occupied	PM 43 crosses Insulated Joint located adjacent to signal 52				
06.46.21	D98	Status	D98-15AAT Occupied	PM 43 continues towards Switch 11				
06.46.48	D98	Status	D98-D2-281 Occupied	PM 43 clears Switch 11				
Circuit Power Failure: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Processor Failure: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Power Transfer: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>								

CONCLUSION

- Switch 11 has been Out of Correspondence from prior to 04.45 that morning until it was restored at 07.02 by ATCM personnel
- With switch 11 out of correspondence, Signals 40, 42, and 52 will NOT clear and display a Lunar white aspect.
- ATC personnel took control of the panel at 06.20.52 and worked to restore Switch 11.
- PM 43 did cross the Insulated joint adjacent to Signal 52 at 06.22.16 and remained at that location until 06.46.21

ORIGINAL
06/5/2023

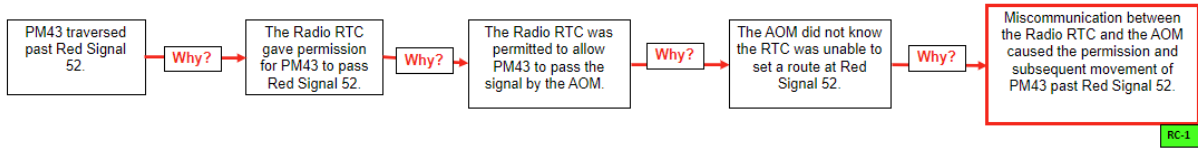
Incident Report 0.0
Page 1 of 1
Incident Analysis Report 0.0-06052023_Theo.docx

Document 2 – Oracle Report Page 1 of 1.

Appendix D – Why-Tree Analysis

Incident Date: 05/28/2023 Time: 06:22 hours
 Final Report – Improper Rail Vehicle Movement
 E23360

Drafted By: SAFE 705 – 0726/2023
 Reviewed By: SAFE 707 – 07/26/2023
 Approved By: SAFE 707 – 07/27/2023



Root Cause Analysis

