



WMSC Commissioner Brief: W-0132 – Improper Roadway Worker Protection – L’Enfant Plaza Station – July 26, 2021

Prepared for Washington Metrorail Safety Commission meeting on December 7, 2021

Safety event summary:

A Metrorail Track and Structures Roadway Worker In-Charge (RWIC) of a trash cleaning crew entered the roadway at L’Enfant Plaza Station when the Rail Operations Control Center (ROCC) believed the RWIC was entering the roadway between Shaw-Howard U and Mt. Vernon Square stations.

The Green and Yellow Line chain marker numbers on the F Line at L’Enfant Plaza Station (F03) are similar to the chain marker numbers on the E Line at Shaw-Howard U Station (E02) because the stations are a similar distance from Gallery Place-Chinatown Station in opposite directions. Gallery Place-Chinatown Station is considered the zero location for the E and F lines. The difference in identifiers between chain markers in the area of L’Enfant Plaza and Shaw-Howard U stations is the initial letter: E or F. The RWIC’s work assignment was written out as L’Enfant Plaza Station on a departmental work assignment sheet and at the top of the General Orders and Track Rights System (GOTRS) assignment, but the chain markers and related alphanumeric information used later in the document to obtain track rights reflected Shaw-Howard U station.

The RWIC requested permission over the radio at 11:43 p.m. to activate their track rights at F03 (L’Enfant Plaza Station) chain markers 037+00 to 060+00, but the ROCC Radio Controller repeated back that the rights were requested at “Echo 1 and 2 037+00 to 060+00.” F037+00 to F060+00 includes L’Enfant Plaza Station while E037+00 to E060+00 includes Shaw-Howard U Station. Neither the RWIC nor the ROCC controller used 100 percent repeat back, and the RWIC used the letter “F” rather than “Foxtrot” in their transmission. Neither identified any discrepancies in the transmissions.

At approximately 1:08 a.m., the ROCC Button Controller established foul time protection at the chain markers specified in the track rights system, at Shaw-Howard U Station. The ROCC Radio Controller provided the signals that were red as part of that foul time protection on the E Line in a radio transmission granting track access. The RWIC did not identify that the stated signals were at Shaw-Howard U Station, not at L’Enfant Plaza Station, and did not conduct a 100 percent repeat back. The RWIC entered the roadway at L’Enfant Plaza Station.

The RWIC’s location was identified when the RWIC reported having hot stuck to confirm power was down at L’Enfant Plaza Station and requested to shorten their work zone. The ROCC controller and RWIC then identified that they had not properly communicated.

Although the RWIC reported power had been de-energized at L’Enfant Plaza Station,, the RWIC had used a broken hot stick, and third rail power actually remained energized. In an investigative interview, the RWIC stated that they had dropped their hot stick, which may have damaged it. In addition, CCTV shows that the RWIC was not wearing required personal protective equipment (hardhat) while on the roadway.

Metrorail did not remove the ROCC Radio Controller from service for post-event drug and alcohol testing as required by Metrorail policy.



Probable Cause:

The probable cause of this event was the approval of General Orders and Track Rights System (GOTRS) requests with contradictory information, inadequate supervisory oversight and compliance with radio communications protocols, and a lack of effective physical characteristics training for Metrorail personnel. Contributing to the potential severity of and scope of the consequences of this event and adding an additional element of improper roadway worker protection was the use of a non-functioning hot stick.

Corrective Actions:

Metrorail is evaluating technology solutions to effectively prevent conflicting or erroneous information from being entered into the GOTRS system, such as auto-generation of work descriptions, addition of drop-down menu items, and additional required fields.

Metrorail conducted a roadway worker protection safety standdown emphasizing the importance of proper Communications and personal protective equipment.

The RWIC and Radio Controller received additional training.

Track and Structures distributed a lessons learned document emphasizing the importance of verifying chain markers in GOTRS before accessing the roadway, 100 percent word-for-word repeat back, use of phonetic alphabet, and testing a hot stick on a live circuit before each use.

WMSC staff observations:

Metrorail has open CAPs related to 100 percent repeat back and radio communications. This will need continued attention even after the CAP is closed.

Metrorail should consider more immediate improvements to the GOTRS request entry, review and oversight process while longer-term changes are developed and implemented.

The RWIC's crew had not signed the roadway job safety briefing form, despite the RWIC stating that a briefing had been conducted. These briefings are important safety tools that Metrorail must ensure continued supervisory oversight of.

This is one of several events that suggest inadequate physical characteristics training for Metrorail personnel. The RWIC could not identify the locations of signals in an investigative interview. The WMSC expects to address aspects of these deficiencies through the ongoing Rail Operations Audit (draft report being developed).

Staff recommendation: Adopt final report.



Washington Metro Area Transit Authority
Department of Safety and Environmental
Management (SAFE)
FINAL REPORT OF INVESTIGATION A&I E21324

Date of Event:	07/26/2021
Type of Event:	Improper Roadway Worker Protection
Incident Time:	01:08 hours
Location:	L'Enfant Plaza Station, at CM F1-037+00 to F1-060+00
Time and How received by SAFE:	01:30 hours. SAFE/IMO In-Person Notification
WMSC Notification Time:	03:01 hours
Responding Safety Officers:	WMATA: No WMSC: No Other: No
Rail Vehicle:	No
Injuries:	No
Damage:	No
Emergency Responders:	None
SMS I/A Number	20210727#94675

L'Enfant Plaza Station, at CM E1-037+00 to E1-060+00
Improper Roadway Worker Protection
July 26, 2021
Table of Contents

Executive Summary	4
Incident Site	5
Purpose and Scope	6
Investigation Methods	6
Investigation	6
Sample ETO RWP Protection Setup	7
Audio Recording System (ARS) Chronological Event Timeline	7
Advanced Information Management System (AIMS)	9
Closed-Circuit Television (CCTV)	10
Office of System Maintenance Communication Section (COMM)	10
Interview Findings	11
Weather	12
Human Factors	12
Fatigue	12
Post-Incident Toxicology Testing	12
Findings	12
Immediate Mitigation to Prevent Recurrence	13
Probable Cause Statement	13
SAFE Recommendations/Corrective Actions	15
Appendices	16
Appendix A – Interview Summaries	16
Track Repairer B – RWIC	16
Radio RTC	17
Appendix B – TRST – General Orders & Track Rights System	18
Appendix C – TRST Work Assignment Sheet	21
Appendix D – TRST – Roadway Job Safety Briefing (RJSB)	22
Appendix E – TRST Lessons Learned	24
Appendix F – ROCC Communications Refresher Training	26
Appendix G – ROCC Lessons Learned Improper Repeat Back & Incorrect Work Location	27
Appendix H - Root Cause Analysis	28

Abbreviations and Acronyms

AIMS	Advanced Information Management System
ARS	Audio Recording System
CAP	Corrective Action Plan
CCTV	Closed-Circuit Television
CM	Chain Marker
ETO	Exclusive Track Occupancy
FT	Foul Time
GOTRS	General Orders and Track Rights System
IMO	Incident Management Official
MSRPH	Metrorail Safety Rules and Procedures Handbook
OJT	On the Job Training
NOAA	National Oceanic and Atmospheric Administration
ROCC	Rail Operations Control Center
RTC	Rail Traffic Controller
RTRA	Office of Rail Transportation
RWIC	Roadway Worker in Charge
RWP	Roadway Worker Protection
SAFE	Department of Safety and Environmental Management
SAFTE-FAST	Sleep Activity Fatigue Task Effectiveness-Fatigue Avoidance Scheduling Tool
SMS I/A	Safety Measurement System Incidents/Accidents
SRC	Safety Risk Coordinator
TBD	To Be Determined
TSMT	Office of Technical Skills Maintenance Training
TRST	Office of Track and Structures
WMATA	Washington Metropolitan Area Transit Authority
WMSC	Washington Metrorail Safety Commission
WWPL	Wayside Work Planning

Executive Summary

On Monday, July 26, 2021, at approximately 01:30 hours, the Department of Safety and Environment Management (SAFE) Incident Management Official (IMO) was notified by the Rail Operations Control Center (ROCC) Assistant Superintendent of an Improper Roadway Worker Protection (RWP) event at L'Enfant Plaza Station, Track 1. Upon further investigation, the Audio Recording System (ARS) playback revealed that at approximately 01:08 hours, the Office of Track and Structures (TRST) Roadway Worker in Charge (RWIC) was granted permission by the ROCC to access the roadway under Foul Time (FT) protection to hot stick and confirm a de-energized track between Shaw/Howard Station and Mt. Vernon Square Station, Track 1 and Track 2. However, the RWIC accessed the roadway at L'Enfant Plaza Station, Track 1 on the F-line, which has similar Chain Markers (CM) as Shaw/Howard Station (E02) and Mt. Vernon Square Station (E01) on the E-line. The Improper RWP was discovered when the RWIC provided the ROCC Radio Rail Traffic Controller (RTC) with the incorrect Line and CMs after hot sticking to verify that third rail power was de-energized.

Review of the audio recordings indicated there were communication deficiencies. Based on ARS playback, at approximately 23:44 hours, the RWIC requested to activate their General Orders and Track Rights System (GOTRS) rights at "F03, Tracks 1 and 2, Chain Markers 037+00 to CM 060+00. How you copy? That's Track 1 and 2, over." In response, the Radio RTC stated, "you've got Echo 1 and 2, 037+00 to 060+00. Got your request time at 23:44 hours, over."

Upon completing the request for activation of track rights by the RWIC, the Button RTC established foul time protection by activating blue block, human forms and de-energized third rail power at Shaw/Howard Station, Track 1, and Track 2 at the CMs for the protected work area entered into the GOTRS. See *Diagram 1*. The Advanced Information Management System (AIMS) playback revealed that at approximately 01:09 hours, third rail power remained energized at L'Enfant Plaza Station, Track 1, and Track 2 when the RWIC entered the roadway to hot stick and confirm that third rail power was de-energized. At approximately 01:24 hours, the RWIC contacted the Radio RTC and stated third rail power had been confirmed de-energized at L'Enfant Plaza Station (F03), CM F1-052+00 to F1-048+00. **Note:** *RWIC used a defective/damaged hot stick to verify the third rail was de-energized, providing a false indication of power down.*

The approved GOTRS request indicated that the RWIC was working under Exclusive Track Occupancy (ETO) with a Supervisory Power Outage between Shaw/Howard Station and Mt. Vernon Square Station, Track 1 and Track 2. The purpose of the TRST GOTRS rights was to remove trash and debris from the roadway within the platform limits. Per GOTRS, the protected limits were from CM E1-037+00 to E1-060+00 and CM E2-037+00 to E2-060+00. However, the request title stated: "TKMSE F03 STATION CLEANING TRACKS 1 & 2" (emphasis added). See *Appendix B*.

The ARS playback indicated that at approximately 02:34 hours, the RWIC canceled their work due to improper GOTRS information that resulted in the work crew responding to the incorrect location.

During SAFE virtual interviews, the RWIC stated they overlooked the error on the GOTRS form and thought they were at the correct work location based on the GOTRS title. Also, the RWIC indicated that they did not realize the ROCC was saying E-Line over the radio. The Radio RTC stated that they heard the RWIC state E03 CM 037+00 to CM 060+00 for their GOTRS request.

The Radio RTC stated that they did not hear the RWIC state F03 during their initial request. Based on review of the audio recordings, both parties failed to consistently use phonetic alphabet to identify locations.

Review of audio recordings did not reveal any communication system deficiencies. There were no reported encroachments, damage, nor injuries while the RWIC was on the roadway at L'Enfant Plaza Station, Track 1. The RWIC was removed from service for post-incident toxicology testing.

The probable cause of the Improper RWP event on July 26, 2021, was human performance difficulty and lack of procedural adherence from the RWIC and the Radio RTC. The RWIC has the ultimate authority and responsibility to protect the work crew and property by verifying they have the correct Line, track number, chain markers, and station names in GOTRS for their work limits before accessing the roadway. Contributing Factors to the event were failures to consistently use the phonetic alphabet and 100% repeat-back between the RWIC and Radio RTC during the RWIC's initial request. An additional causal factor related to the event was the inconsistencies in the work locations within the GOTRS Track Rights and the TRST Work Assignment Sheet. While not contributing to the event, it was also determined that the RWIC used a defective hot stick, which resulted in them mistakenly reporting that the third rail at their location was de-energized.

Incident Site

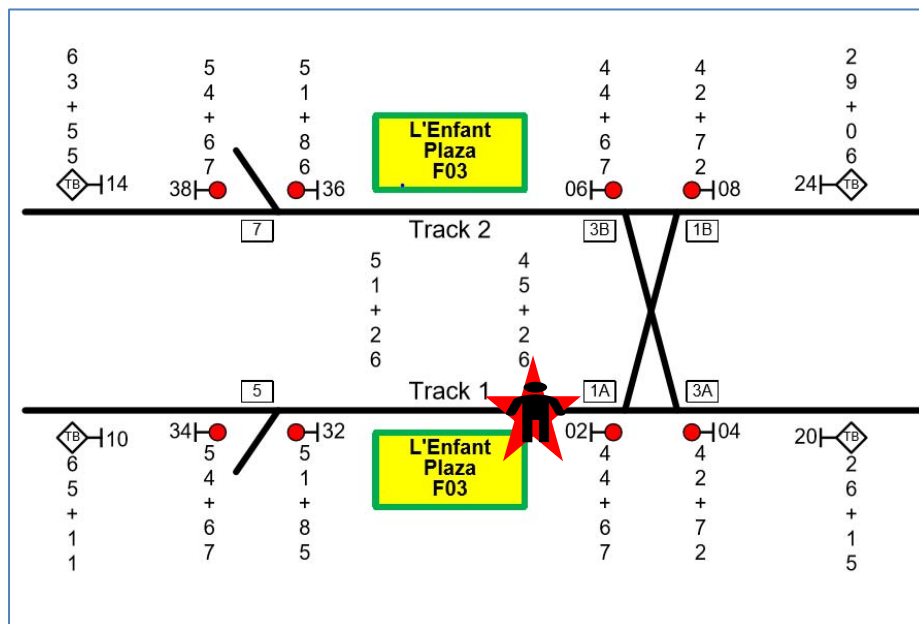
L'Enfant Plaza Station, at CM E1-037+00 to E1-060+00

TRST – GOTRS

Actual – Chain Marker E1-042+00 to E1-055+00 and E2-042+00 to E2-055+00

Protected – Chain Marker E1-037+00 to E1-060+00 and E2-037+00 to E2-060+00

Field Sketch/Schematics



Purpose and Scope

The purpose of this incident 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.

Investigation Methods

The investigative methodologies included the following:

- Formal Interview – SAFE performed two interviews as part of this investigation in conjunction with the WMSC. The following personnel were interviewed:
 - TRST – RWIC, Track Repairer B
 - ROCC – Radio RTC
- Informal Interviews – Collected through conversations with individuals during the investigation to provide background and supporting information.
- Documentation Review – A collection of relevant work history information and process documentation in Metro systems of record. These records include:
 - Employee Training Procedures & Records
 - RWP Certification
 - The 7-Day work history review
 - Metrorail Safety Rules and Procedures Handbook (MSRPH)
 - Washington Metropolitan Area Transit Authority (WMATA), Section 5 – Roadway Worker Protection (RWP) Manual Review
 - National Oceanic and Atmospheric Administration (NOAA)
 - Rail Operations Control Center (ROCC) Procedures Manual Review
 - Office of Systems Maintenance Communication Section (COMM)
- System Data Recording Review – A collection of information contained in Metro Data Recording Systems. This data includes:
 - Audio Recording System (ARS) playback [Radio and Phone Communications]
 - Advanced Information Management System (AIMS)
 - Closed-Circuit Television (CCTV) playback
 - General Orders and Track Rights System (GOTRS)

Investigation

On Monday, July 26, 2021, at approximately 01:30 hours, EDT, the SAFE-IMO was notified by the ROCC Assistant Superintendent of an Improper RWP event at L'Enfant Plaza Station, Track 1. At approximately 01:08 hours, the TRST RWIC was granted permission by the ROCC to access the roadway under FT protection to hot stick and confirm a de-energized track between Shaw/Howard Station (E02) and Mt. Vernon Square Station (E01), Track 1 and Track 2. However, the RWIC accessed the roadway at L'Enfant Plaza Station (F03), Track 1 on the F-line, which has similar CMs as Shaw/Howard Station (E02) and Mt. Vernon Square Station (E01) on the E-line. The Improper RWP was discovered when the RWIC provided the Radio RTC with the incorrect Line and CMs after hot sticking to verify that third rail power was de-energized. There were no reported encroachments, damage, nor injuries while the RWIC was on the roadway at L'Enfant Plaza Station (F03), Track 1.

Sample ETO RWP Protection Setup

Per MSRPH RWP, as detailed in section 5.13.7. An ETO RWP setup requires shunts to be located at 500 feet outside of each end of the working zone, red lanterns, or e-flares, "END Work AREA" mats, and Warning Strobes Alarm Devices (WSADS)

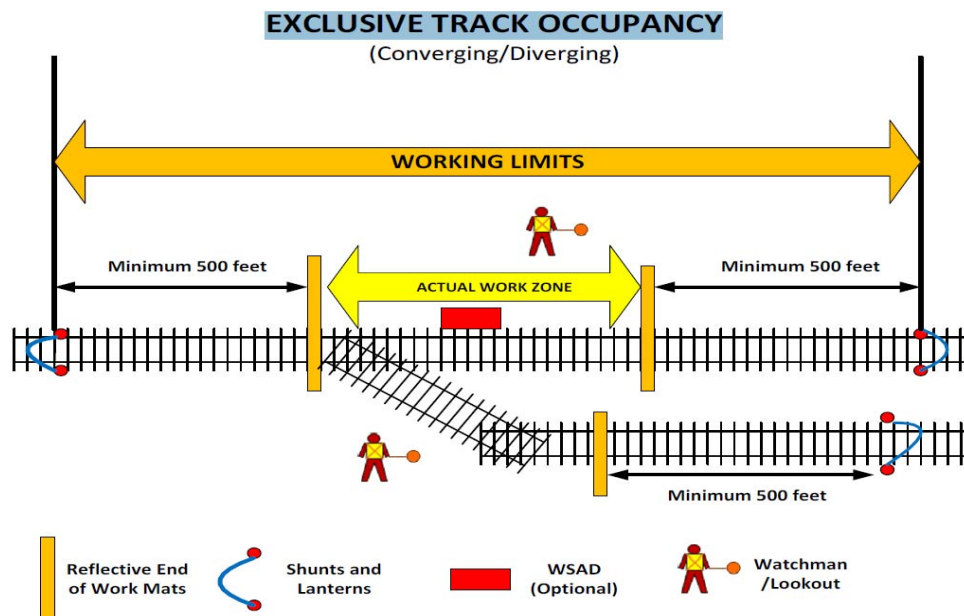


Diagram 1 –Example ETO protection diagram.

Audio Recording System (ARS) Chronological Event Timeline

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

Time	Description
23:43:34 hours	<p><u>RWIC</u>: Contacted Radio RTC and stated they are requesting Supervisory Power Outage at F03 on Track 1 and Track 2, CM 037+00 to CM 060+00.</p> <p><u>Radio RTC</u>: Acknowledged and asked the TRST RWIC what type of protection are you using?</p> <p><u>RWIC</u>: Responded, Supervisory Power Outage, ETO protection.</p> <p><u>Radio RTC</u>: Acknowledged and stated, you are requesting Supervisory Power Outage, ETO protection. The Radio RTC indicated, you have E1 and E2, CM 037+00 to CM 060+00, and I have your request time at 23:44 hours, standby and stand clear.</p> <p><u>RWIC</u>: Acknowledged. [Ops 3]</p>
01:08:14 hours	<p><u>Radio RTC</u>: Contacted the RWIC and stated Signal E03-08 is red and Signal E01-02 is red; all prohibit exits blue block human form are in place. You have permission under FT protection to enter the roadway to hot stick, confirm a de-energized track on Tracks 1 and 2, contact the ROCC with a CM, and relinquish your FT.</p> <p><u>RWIC</u>: Acknowledged and responded after I confirm Track 1 is de-energized, I will notify the ROCC to request FT on Track 2.</p> <p><u>Radio RTC</u>: Responded, you have FT on both tracks at this time.</p> <p><u>RWIC</u>: Acknowledged. [Ops 3]</p>

Time	Description
01:24:36 hours	<p><u>RWIC</u>: Contacted Radio RTC and stated third rail power had been confirmed de-energized at CM 060+00 and 030+00. The RWIC then requested to downgrade their work location to F03, F1-045+00 to F1-052+00.</p> <p><u>Radio RTC</u>: Responded, that is a negative on downgrading your work location. Since you requested and took it now, you have the hot stick for the entire work location. I do need those CMs again over.</p> <p><u>RWIC</u>: Responded, it is F03 on Track 1 and Track 2, CM 037+00 to CM 060+00.</p> <p><u>Radio RTC</u>: Responded, I need the CMs you hot stucked.</p> <p><u>RWIC</u>: Responded I hot stucked at CM F1-052+00 to F1-048+00.</p> <p><u>Radio RTC</u>: Responded, you are on the E Line.</p> <p><u>RWIC</u>: Responded: I am at L'Enfant Plaza Station, F03.</p> <p><u>Radio RTC</u>: Responded, what was your CM at your work location?</p> <p><u>RWIC</u>: Responded, my work location was CM F1-037+00 to CM 060+00 at F03.</p> <p><u>Radio RTC</u>: Responded, give the ROCC a landline. [Ops 3]</p>
01:28:49 hours	<p><u>RWIC</u>: Contacted ROCC RTC via a landline.</p> <p><u>ROCC RTC</u>: Stated to the RWIC that their CMs are on the E Line.</p> <p><u>RWIC</u>: Responded, my document indicates the F Line, I will reach out to my TRST Supervisor.</p> <p><u>ROCC RTC</u>: Responded, you indicated E Line when you gave your request.</p> <p><u>RWIC</u>: Responded, I apologize I thought I stated F03.</p> <p><u>ROCC RTC</u>: Responded, either way your CMs indicate the E Line, the title of your GOTRS form that states F03 is incorrect, and the third rail is not de-energized at L'Enfant Plaza Station, Track 1, and Track 2.</p> <p><u>RWIC</u>: Responded, when I hot stucked, third rail power was de-energized.</p> <p><u>ROCC RTC</u>: Responded, I do not know how because I did not de-energize power in that area. The ROCC RTC instructed the RWIC to contact their TRST Supervisor because the E Line is listed on the GOTRS. [Phone]</p>
01:39:30 hours	<p><u>RWIC</u>: Contacted ROCC Assistant Superintendent and reported they will have to cancel their GOTRS because the wrong line was entered.</p> <p><u>ROCC Assistant Superintendent</u>: Responded, what does your CMs say on your GOTRS form?</p> <p><u>RWIC</u>: Responded, the document states the F-Line, but I have E-Line CMs.</p> <p><u>ROCC Assistant Superintendent</u>: Responded, when you gave your initial request did you request the F-Line or the E Line.</p> <p><u>RWIC</u>: Responded, I requested the F-Line.</p> <p><u>ROCC Assistant Superintendent</u>: Responded, what is your location?</p> <p><u>RWIC</u>: Responded, L'Enfant Plaza Station.</p> <p><u>ROCC Assistant Superintendent</u>: Responded, I need everyone to clear up due to the discrepancies in GOTRS for further investigation. [Phone]</p>
01:50:20 hours	<p><u>TRST Supervisor</u>: Contacted ROCC Assistant Superintendent and asked, what is going on?</p> <p><u>ROCC Assistant Superintendent</u>: Responded, there is a discrepancy with the CMs and assigned work location in GOTRS. The CMs indicated they should be on the E-Line, but the work location says F-Line, so we are pulling audio to determine the RWIC's initial request. [Phone]</p>

Time	Description
02:12:54 hours	<p><u>TRST Supervisor:</u> Contacted ROCC Assistant Superintendent and asked, you wanted me to contact you?</p> <p><u>ROCC Assistant Superintendent:</u> Responded, the RWIC will be removed from service. The incident time is 01:08 hours due to an RWP violation. The ROCC Assistant Superintendent reported that the RWIC repeated E-Line signals from the Radio RTC but still entered the roadway on the F-Line.</p> <p><u>TRST Supervisor:</u> Acknowledged. [Phone]</p>
02:32:52 hours	<p><u>ROCC Assistant Superintendent:</u> Contacted the RWIC and instructed them to cancel their GOTRS over the radio for improper GOTRS. [Phone]</p>
02:34:40 hours	<p><u>RWIC:</u> Contacted the Radio RTC and reported they are canceling their GOTRS due to insufficient GOTRS.</p> <p><u>Radio RTC:</u> Acknowledged. [Ops 3]</p>

****Note:** Times above may vary from other system's timelines based on clock settings.

Advanced Information Management System (AIMS)

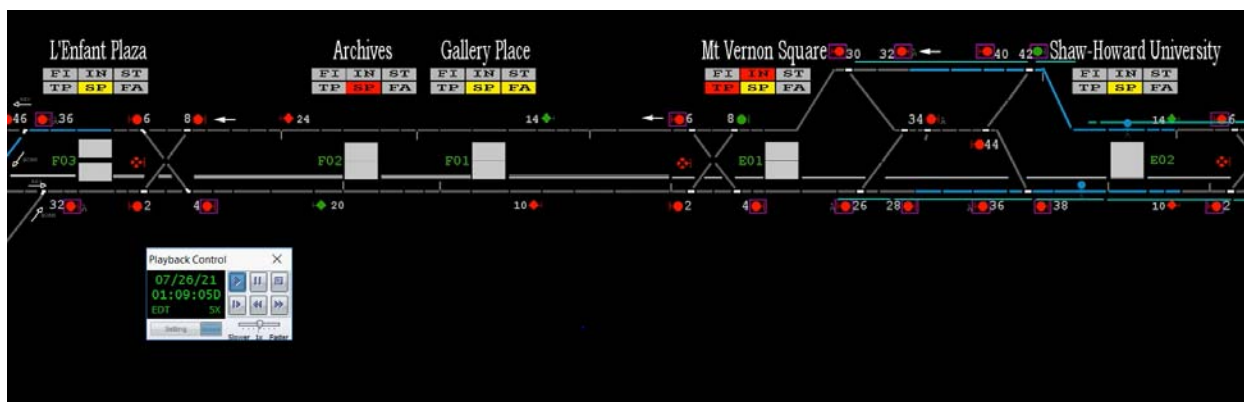


Diagram 2 - Based on the AIMS, at 01:09:05 hours, prohibit exits, block calls, cancellation of automatic signals, blue block, and human form status were not in place before the RWIC entered the roadway to hot stick and confirmed that third rail power was de-energized between L'Enfant Plaza Station, Track 1 and Track 2. However, blue block and human form status were in place, and third-rail power was de-energized at Shaw-Howard University Station at the CMs for the protected and actual work listed in the GOTRS.

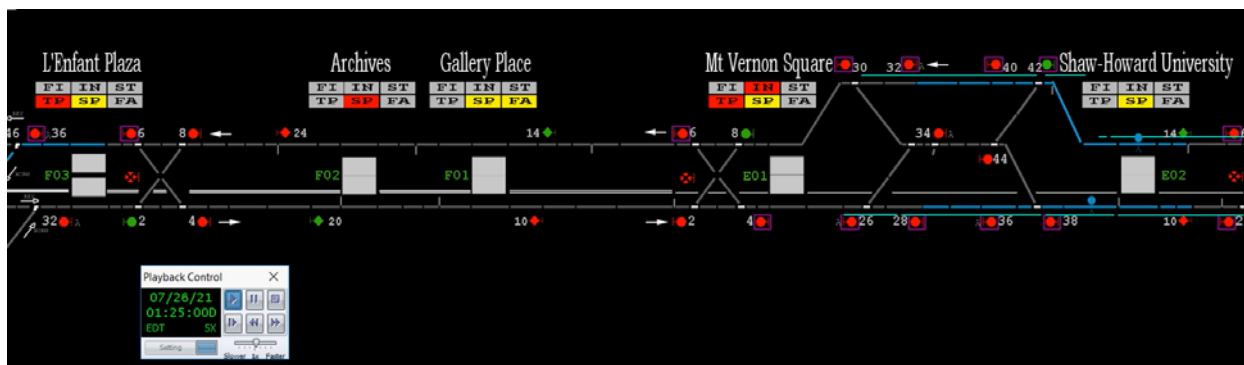


Diagram 3 - Based on the AIMS, at 01:25:00 hours, third rail power was not de-energized at L'Enfant Plaza Station, Track 1 and Track 2 after the RWIC contacted the Radio RTC and reported that they entered the roadway to hot stick and confirmed that third rail power was de-energized.

Closed-Circuit Television (CCTV)



Figure 1 - The RWIC entered L'Enfant Plaza Station, Track 1 roadway, to perform hot stick efforts and without wearing a hard hat at approximately 01:10 hours.



Figure 3 – The hot stick returned by the RWIC was reported as defective and tagged out of service by TRST.

Office of System Maintenance Communication Section (COMM)

COMM performed a comprehensive radio operational test at L'Enfant Plaza Station, Track 1 and Track 2. The test was successful, and the signal was at an optimal level.

Review of the ARS playback, did not reveal any communication deficiencies with the radio or telephone systems.

Interview Findings

SAFE conducted two interviews via virtual Microsoft Teams. These interviews identified the following key findings associated with this event and are as follows:

RWIC

During the virtual interview, the RWIC stated that they contacted Radio RTC and said they were requesting Supervisory Power Outage at L'Enfant Plaza Station on Track 1 and Track 2, CM 037+00 to CM 060+00. The employee stated the ROCC then instructed them to standby and stand clear. The employee indicated that at approximately 01:10 hours, the ROCC contacted them. The employee said they gave the ROCC the work assignment location again at L'Enfant Plaza Station on Track 1 and Track 2, CM 037+00 to CM 060+00. The employee stated the ROCC responded breakers had been commanded open in your area; you are granted FT to hot stick and confirm third rail power is de-energized. The employee was provided signals to repeat and said they repeated the signals. The employee stated they typically write down the signals when given by the ROCC to make sure they are correct, but that day, they did not. The employee said they then entered the roadway to hot stick and then contacted the ROCC and asked if they could shorten their work area and was denied. After providing the CMs where they hot stuck, the employee stated the ROCC informed them that the CMs provided are wrong, and the CMs for hot sticking are on the E Line. When they responded to the ROCC, that they were going by the GOTRS form, and the ROCC asked for a landline. When they contacted the ROCC via landline, the ROCC said that the third rail is not de-energized at L'Enfant Plaza Station, Track 1, and Track 2. The employee stated that they told them they hot stuck, and third rail power was confirmed de-energized. The ROCC then said I do not know how because I did not de-energize power in that area. That is when the employee looked at their hot stick and realized it was broken and pieces were missing from dropping their hot stick when they were on the roadway. The RWIC stated that they were going based on their GOTRS form because the work location was L'Enfant Plaza Station and did not realize the ROCC was saying E Line over the radio and overlooked the discrepancy on the GOTRS form.

Radio RTC

The Radio RTC stated the RWIC had GOTRS rights for a Supervisory Power Outage with ETO RWP. The Radio RTC stated that they heard the RWIC state E03 CM 037+00 to CM 060+00 for their GOTRS rights, and the Radio RTC said they repeated back the CMs they heard on the console and provided a request time. The Radio RTC indicated they did not hear the RWIC state F03 during their initial request. The Radio RTC stated their Buttons partner de-energized third rail power based on the CMs in GOTRS which were E1 and E2 CM 037+00 to CM 060+00. The Radio RTC said they provided the RWIC their FT signals which were on the E-Line, and power was de-energized in their work location, and the RWIC was granted FT protection to hot stick. The Radio RTC said the RWIC never reported any discrepancies on what the ROCC stated, so they proceeded. After the RWIC hot stuck, they contacted the RWIC and stated third rail power was de-energized and provided CMs at L'Enfant Plaza Station, and the Radio RTC instructed them to landline the ROCC.

Weather

At the time of the incident, National Oceanic and Atmospheric Administration (NOAA) recorded the temperature as 75° F and passing clouds with 80% humidity. The incident occurred within a tunnel section of the rail system. Weather was determined not to be a contributing factor in this incident. Weather source: NOAA – Location: Washington, DC.)

Human Factors

Fatigue

RWIC

Evidence of Fatigue

The incident data was evaluated, and no signs or symptoms of fatigue were detected from the available data. The RWIC reported feeling fully alert at the time of the incident. The RWIC reported experiencing no symptoms of fatigue in the time leading up to the incident.

Fatigue Risk

The incident data was evaluated for fatigue risk factors. Risk factors for fatigue were not present. The incident time of day did not suggest an increased risk of fatigue-related impairment. The RWIC was awake for 5.63 hours at the time of the incident. The RWIC reported 16 hours of sleep in the 24 hours preceding the incident. The off-duty period was 16 hours which provides an opportunity for 7-9 hours of sleep. The RWIC reported no issues with sleep.

Since fatigue evidence and risk factors were not present, the biomathematical fatigue modeling application, Sleep Activity Fatigue Task Effectiveness-Fatigue Avoidance Scheduling Tool (SAFTE-FAST), was not applied.

Post-Incident Toxicology Testing

After reviewing the RWIC's post-incident testing results, it was determined that they were not in violation of the Drug and Alcohol Policy and Testing Program 7.7.3/6.

Findings

- RWIC and Radio RTC failed to use consistent phonetic alphabet and 100% repeat-back during the initial request for right-of-way access.
- RWIC failed to identify the signals provided for FT protection were not relevant to their physical location. During the transmission, the RWIC did not use 100% repeat-back of the entire transmission but did repeat the signals correctly.
- Following the incident, the RWIC was unable to identify the location of the E03-08 or E01-02 signals. They believed the signals were located in the area of L'Enfant Plaza Station and Archives Station; however, the signals are located at U Street-Cardozo Station and Mount Vernon Square station, respectively.
- The GOTRS Title and description fields represented a job to be performed at F03, while the Protected Limits listed Chain Markers on the E-line. The RWIC's work location was similarly misstated on their internal TRST work Assignment Sheet as F03 and the CM listed did not include a Line Designation with the CMs.

- The GOTRS title and description fields are free text fields and inputted by the person authoring the document.
- The CMs identified on the GOTRS and Work Assignment Sheet for the E-Line are similar to the CMs on the F-Line at L'Enfant Plaza Station.
- Prohibit exits, block calls, cancellation of automatic signals, blue block, and human form status were not in place for L'Enfant Plaza Station, Track 1 while the RWIC performed hot stick tasks.
- During the SAFE virtual interview, the RWIC stated they overlooked the error on the GOTRS form and thought they were at the correct work location because the GOTRS Title stated "F03." The RWIC also indicated that they did not realize the ROCC was stating E-Line over the radio.
- RWIC used a defective/damaged hot stick to confirm third rail was de-energized, providing a false indication of power down.
- It was determined that the hot stick the RWIC was using was defective, and therefore they mistakenly reported that the third rail at their location was de-energized.
- During the SAFE virtual interview, the Radio RTC stated that they heard the RWIC state E03 CM 037+00 to CM 060+00 for their GOTRS request. The Radio RTC stated that they did not hear the RWIC state F03 during their initial request.
- The RWIC was not wearing a hardhat while on WMATA's roadway. This action was not in compliance with MSRP 5.11, "Personal Protective Equipment Standard for On-Track Safety."
- ROCC Operations Manager reported that they did not feel that the RTC's involvement warranted removal from service for post-incident testing due to the following:
 - The Radio RTC never gave incorrect instructions or chain markers during the request and Foul Time issuance.
 - The Radio RTC caught the RWIC's error after the RWIC hot stuck the wrong location.
 - Findings showed that the RTC's actions were not the root cause of this Improper RWP event.

Note: After further investigation, this conclusion was deemed incorrect. The available information to the ROCC Operations Manager immediately was the audio recording demonstrating that the controller directly played a role in the Improper RWP event.

Immediate Mitigation to Prevent Recurrence

- The ROCC instructed the RWIC to clear the roadway and suspended all work activities due to an Improper RWP event.
- The RWIC was removed from service for post-incident testing.
- On August 9, 2021, SAFE had a meeting with stakeholders from Track Access Maintenance and Construction (TAMC) and the TRST leadership team. This call aimed to identify feasible mitigations within GOTRS to capture inconsistencies within GOTRS Requests. As a result, as an immediate correction, appropriate administrative action has been taken with the personnel responsible for the GOTRS error to prevent a recurrence and ensure the GOTRS information is correct and consistent. **Note:** The GOTRS does not check the review and approval process. That is a manual process performed by WMATA personnel, which has a potential for human error.

Probable Cause Statement

The probable cause of the Improper RWP event on July 26, 2021, was human performance difficulty and lack of procedural adherence from the RWIC and the Radio RTC. The RWIC has the ultimate authority and responsibility to protect the work crew and property by verifying they

have the correct Line, track number, chain markers, and station names in GOTRS for their work limits before accessing the roadway. Contributing Factors to the event were failures to consistently use the phonetic alphabet and 100% repeat-back between the RWIC and Radio RTC during the RWIC's initial request. An additional causal factor related to the event was the inconsistencies in the work locations within the GOTRS Track Rights and the TRST Work Assignment Sheet. Additionally, it was also determined that the RWIC used a defective hot stick, which resulted in them mistakenly reporting that the third rail at their location was de-energized.

SAFE Recommendations/Corrective Actions

The following are the recommendations and corrective actions identified as a result of this investigation. These recommendations and corrective actions are tracked using WMATA's Safety Measurement System Incidents/Accidents (SMS I/A) Module and are verified by SAFE upon completion. The responsible department is identified in the corrective action code, and the respective departmental Safety Risk Coordinator (SRC) will manage the mitigation. Refer to the SMS I/A Module for additional information.

Corrective Action Code	Description	Responsible Party	Due Date
94675_SAFE CAPS_ROCC _001	(CF-1) RTC completed refresher training focusing on proper radio communication with a great deal of emphasis on 100 percent word-for-word repeat back.	ROCC SRC	Completed
94675_SAFE CAPS_ROCC _002	(CF-1) Developed and distributed Lessons Learned based on the incident facts, emphasizing the importance of 100 percent word-for-word repeat back and review of GOTRS when requests are received to ROCC staff.	ROCC SRC	Completed
94675_SAFE CAPS_TRST _001	(RC-1) Developed and distributed Lessons Learned to TRST personnel based on the incident facts. Topics emphasized the importance of verifying the actual chain markers in GOTRS before accessing the roadway, 100 percent word-for-word repeat back, following the International Civil Aviation Organization Phonetic Alphabet radio communication standard to ensure clear and precise radio communication, and testing the hot stick on a viable live circuit before every use.	TRST SRC	Completed
94675_SAFE CAPS_TRST _002	(RC-1) RWIC must retake the 5-day initial RWP Level 4 training that requires the follow-up On the Job Training (OJT) component. TRST Management submitted a request to the Office of Technical Skills Maintenance Training (TSMT) for the RWIC to be enrolled in the initial RWP Level 4 training course and is waiting for the next class to be offered.	TRST SRC	10/26/2021
94675_SAFE CAPS_OPMS _001	(CF-1) Conduct a Stand-down with all RWP-qualified personnel that emphasizes the importance of proper communications, knowledge of system characteristics, and Personal Protective Equipment (PPE)	OPMS SRC	11/30/2021
94675_SAFE CAPS_WWP L_001	(CF-1) GOTRS team to evaluate and identify technology solutions that will effectively prevent conflicting or erroneous information from being entered into the system, such as auto-generation of Work Descriptions, addition of drop-down menu items and additional required fields.	TAMC SRC	07/26/2022

Appendices

Appendix A – Interview Summaries

Office of Track and Structures (TRST)

Track Repairer B – RWIC

Track Repairer B is a WMATA employee with five-and-a-half years of service and two years of experience as a Track Repairer B. The employee started as a Laborer and then held various job grade levels (i.e., Grades D and C). The WMATA employee's RWP Level 4 certification expires in January of 2022. This employee has no history of sleep issues to report.

During the virtual interview, Track Repairer B stated that when they reported to duty, they had their safety meeting with their TRST Supervisor at Branch Avenue Yard and was provided their work assignments. The employee said they do not have direct access to GOTRS; they received a work location printout for that day from their supervisor. Track Repairer B was assigned as the RWIC and indicated they have eight months of experience as a RWIC. The employee stated the nature of the work was to escort a work crew at L'Enfant Plaza Station, Track 1, and Track 2 for station cleaning. They indicated they performed an RJSB at L'Enfant Plaza Station before work commenced and all crew members were wearing proper PPE.

The employee stated that they contacted ROCC and said they were requesting Supervisory Power Outage at L'Enfant Plaza Station on Track 1 and Track 2, CM 037+00 to CM 060+00. The employee stated the ROCC then instructed them to standby and stand clear. The employee indicated that at approximately 01:10 hours, the ROCC contacted them. The employee said they gave the ROCC the work assignment location again at L'Enfant Plaza Station on Track 1 and Track 2, CM 037+00 to CM 060+00. The employee stated the ROCC responded breakers had been commanded open in your area; you are granted FT to hot stick and confirm third rail power is de-energized. The employee was provided signals to repeat and said they repeated the signals. The employee stated they typically write down the signals when given by the ROCC to make sure they are correct, but that day, they did not. The employee said they then entered the roadway to hot stick and then contacted the ROCC and asked if they could shorten their work area and was denied. The employee stated the ROCC then said the CMs provided for hot sticking were wrong, and their CMs should be on the E Line. When they responded to the ROCC that they were going by the GOTRS form, the ROCC asked for a landline. When they contacted the ROCC via landline, the ROCC said that the third rail is not de-energized at L'Enfant Plaza Station, Track 1, and Track 2. The employee stated that they told them they hot stuck, and third rail power was confirmed de-energized. The ROCC then said I do not know how because I did not de-energize power in that area. That is when the employee looked at their hot stick and realized it was broken and pieces were missing from dropping their hot stick when they were on the roadway.

The ROCC instructed the employee to contact their supervisor due to the discrepancy on the GOTRS form and that they needed to clear the roadway and suspend all work activities. The employee stated that they were going based on their GOTRS form because the work location was L'Enfant Plaza Station and did not realize the ROCC was saying E Line over the radio and overlooked the discrepancy on the GOTRS and TRST Work Assignment sheets. **Note:** *The employee expressed that they felt the training received was sufficient to do their job. However, when the employee was asked where the E03-08 signal is located, they stated L'Enfant Plaza Station, however; the signal is located at U Street-Cardo-Zo Station. When the employee was asked where the E01-02 signal is located, they said Archives Station, however; the signal is*

located at Mt. Vernon Square Station. They were going off of memory at the time and not referring to their Track Access Guide

Rail Operations Control Center (ROCC)

Radio RTC

The Radio RTC is a WMATA employee with one-and-a-half years of service. The employee has only worked as an RTC. The WMATA employee was certified as an RTC in February of 2021 and their RWP Level 4 certification expires May of 2022. This employee had no history of sleep issues to report.

During the SAFE interview, the Radio RTC stated they were in the role of the Radio RTC at the time of the Improper RWP incident and reported that they were fully alert. The RWIC had GOTRS rights for a Supervisory Power Outage with ETO RWP. The Radio RTC stated that they heard the RWIC state E03 CM 037+00 to CM 060+00 for their GOTRS rights, and the Radio RTC said they repeated back the CMs they heard on the console and provided a request time. The Radio RTC indicated they did not hear the RWIC state F03 during their initial request. The Radio RTC stated their Buttons partner de-energized third rail power based on the CMs in GOTRS which were E1 and E2 CM 037+00 to CM 060+00. The Radio RTC said they provided the RWIC their FT signals which were on the E-Line, and power was de-energized in their work location, and the RWIC was granted FT protection to hot stick. The Radio RTC said the RWIC never reported any discrepancies on what the ROCC stated, so they proceeded. After the RWIC hot sticked, they contacted the RWIC and stated third rail power was de-energized and provided CMs at L'Enfant Plaza Station, and the Radio RTC instructed them to landline the ROCC. The Radio RTC stated they have access to GOTRS and access the system every night and review their assigned requests. The Radio RTC said that they felt the training they received was sufficient to do their job. At the time of the incident, they did not go through their typical script stating the actual station the work location is at after the breaker had been commanded open. However, from now on, they will focus on the line and track to prevent this from happening again. The ROCC RTC indicated that sometimes it could be challenging to use the phonetic alphabet with personnel in the field.

Appendix B – TRST – General Orders & Track Rights System

GOTRS - GENERAL ORDERS & TRACK RIGHTS SYSTEM Track Rights Request

Request Summary

Request Number:	202118201000	Track Access:	True
Dates Requested:	07/26/2021 00:30 to: 07/26/2021 04:00	Clear In Ten:	False
Request Status:	Opened	Equipment on Track:	0
Requestor:		Allow Piggybacks:	True
Requestor Organization:	TRST/TRACK/MAINTS	In Piggyback:	No
Switch Order:		Power Outage:	Supervisory
Lock Out / Tag Out:		Additional AC:	
Request Title:	TKMSE F03 STATION CLEANING TRACKS 1 & 2		

Location, Work Type and Description

Location:	Mainline
Non-Wayside Location Type:	
Request Type:	Regular
Charge Job Number:	
Contract Number:	
Maximo Work Order:	.
Request Group:	No
Location Description:	
Request Description:	F03 ROW STATION CLEANING TRACKS 1 & 2
Work Type:	Other
Meeting Location:	
PB Meeting Location:	
Tools and Equipment:	PPE,SAFETY EQUIPMENT,HAND TOOLS, DEBRIS BAGS
Equipment on Track:	

	Track 1			Track 2	
Actual Work Area:	E042+00	E055+00	Actual Work Area:	E042+00	E055+00
Protected Work Area:	E037+00	E060+00	Protected Work Area:	E037+00	E060+00

Hot Stick Info. Third Rail Gaps:

From	To	Track ID
E035+37	E051+35	1
E051+91	E076+20	1
E034+53	E050+30	2
E050+83	E051+63	2
E051+91	E073+66	2

Date & Time

As of 07/26/2021 03:10
1 of 3

Attachment 1 – Page 1 of 3.

GOTRS - GENERAL ORDERS & TRACK RIGHTS SYSTEM

Track Rights Request

Request Summary

Request Number:	202118201000	Track Access:	True
Dates Requested:	07/26/2021 00:30 to: 07/26/2021 04:00	Clear In Ten:	False
Request Status:	Opened	Equipment on Track:	0
Requestor:	[REDACTED]	Allow Piggybacks:	True
Requestor Organization:	TRST/TRACK/MAINTS	In Piggyback:	No
Switch Order:		Power Outage:	Supervisory
Lock Out / Tag Out:		Additional AC:	
Request Title:	TKMSE F03 STATION CLEANING TRACKS 1 & 2		

Start: 07/26/2021 00:30

End: 07/26/2021 04:00

Contacts

Entered by

[REDACTED]

Work:

[REDACTED]

Cell:

[REDACTED]

Home:

Requestor

[REDACTED]

Work:

[REDACTED]

Cell:

[REDACTED]

Home:

[REDACTED]

WMATA Manager

[REDACTED]

Work:

[REDACTED]

Cell:

[REDACTED]

Home:

[REDACTED]

Emergency Contact

[REDACTED]

Work:

[REDACTED]

Cell:

[REDACTED]

Home:

[REDACTED]

Support

SUPPORT GROUP	Crew Size
---------------	-----------

TRST/TRACK	4
------------	---

Request Change History

Date	Event
07/01/2021 16:49	Request was created.
07/12/2021 15:03	Request status was changed to Approved
07/26/2021 02:39	Work Prep was completed.
07/26/2021 03:44	Request status was changed to Opened

Request Group

Request Number	Description
----------------	-------------

Piggyback

No active piggybacks found

As of 07/26/2021 03:10
2 of 3

Attachment 1 – Page 2 of 3.

GOTRS - GENERAL ORDERS & TRACK RIGHTS SYSTEM

Track Rights Request

Request Summary

Request Number:	202118201000	Track Access:	True
Dates Requested:	07/26/2021 00:30 to: 07/26/2021 04:00	Clear In Ten:	False
Request Status:	Opened	Equipment on Track:	0
Requestor:	[REDACTED]	Allow Piggybacks:	True
Requestor Organization:	TRST/TRACK/MAINTS	In Piggyback:	No
Switch Order:		Power Outage:	Supervisory
Lock Out / Tag Out:		Additional AC:	
Request Title:	TKMSE F03 STATION CLEANING TRACKS 1 & 2		

Red Tag information

Red Tag #: Request is not Red Tag.

Close-Out Summary

Final Status:	Opened
Request To Begin Work:	07/25/2021 23:44
Request to De-Energize:	07/26/2021 01:08
De-Energization Completed; RWIC notified:	07/26/2021 01:08
Hot Stick:	step not done
Permission Given To Setup Work Site:	step not done
Start Work:	step not done
Work Site Cleared by Requestor:	07/26/2021 02:38
Work Stopped by Requestor:	07/26/2021 02:35
Reason:	Not enough manpower

OCC Comments:

OCC Assistant Superintendent
Comments:

Requestor Comments:

OCC Delays

Delay #	From	To	Reason	Re-Hot Stick Done
1	07/26/2021 02:04	07/26/2021 02:34	Inproper GOTRS rights.	

As of 07/26/2021 03:10
3 of 3

Attachment 1 – Page 3 of 3.

Date: 07/26/2021 Time: 01:08 hours.
Final Report Rev. 1 – Improper RWP
E21324

Drafted By: SAFE 705 – 09/12/2021
Reviewed By: SAFE 71 – 09/23/2021
Approved By: SAFE 71 – 09/24/2021

Page 20

Appendix C – TRST Work Assignment Sheet

BRANCH AVENUE TRST WORK ASSIGNMENT SHEET							
Date: July 25, 2021							
Emergency Contact: [REDACTED]							
Supervisors: [REDACTED]							
Shift: 22:00 to 06:00							
RWIC/GANG LEADER	UNITS	OPERATORS	TRACK REPAIRERS	LABORERS & Welders	WORK LOCATION	WORK DESCRIPTION	
[REDACTED]	PM65	[REDACTED]	[REDACTED]		E05 to E06 Track (2) CM: E2 210+00 to E2 260+00	Maintenance: <u>Thermite Welding</u> RID: 202118302100 JUNIOR WO# 16463924 Outage: <u>Supervisory</u> Time: 00:30 to 04:00	
[REDACTED]	PM62	[REDACTED]	[REDACTED]		F04 Track (2) CM: F2 065+00 to F2 092+00	Maintenance: <u>Gauge Correction</u> RID: 202118103700 JUNIOR WO# 16414637 Outage: <u>Red Tag</u> Time: 00:30 to 03:00	
[REDACTED]	PM48	[REDACTED]	[REDACTED]		F06 to F07 Track (2) CM: F2 204+00 to F2 255+00	Maintenance: <u>Fastener Renewal</u> RID: 202118302300 WO# 16463936 Outage: <u>Supervisory</u> Time: 00:30 to 03:30	
[REDACTED]	Foot				F03 Tracks (1&2) CM: 037+00 to 060+00	Maintenance: <u>Station Cleaning</u> RID: 202118201000 WO# 16457077 Track (1) WO# 16457081 Track (2) Outage: <u>Supervisory</u> Time: 00:30 to 04:00	
		[REDACTED]	[REDACTED]		B99 Yard	Day Shift Tass Support	
					F99 yard	M&M Support	
Transports							
EQUIPMENT LINE UP							
A99	B98	B99	C99	D99	E99	F99	K98 K99

Attachment 2 – Page 1 of 1.

Appendix D – TRST – Roadway Job Safety Briefing (RJSB)

WMATA ROADWAY JOB SAFETY BRIEFING FORM

Req 23:44

Incident Time: 01:08am

DATE: 07-26-2021

TRACK TIME ON/OFF: N/A, N/A

RWIC NAME: [REDACTED] CALL#: [REDACTED] EMPLOYEE #: [REDACTED]

RWIC's CELL PHONE NUMBER [REDACTED] RADIO OPS CHANNEL: 3

SAFETY RULE OF THE DAY: S.O.P 2.16 R.W.P 3.4

WORK ASSIGNMENT: Station Clean DIRECTION OF TRAFFIC: INBOUND ☒ OUTBOUND ☐

RAIL LINE: A B C D E F G J K L N TRACK 1 2 3 WORK LIMITS CHAIN MARKER(s): 103 - 037400 - 060400

PLACE OF SAFETY:

TYPE OF PROTECTION(s): IT ☐ ETO AUTHORITY ☒ ETO LOCAL SIGNAL ☐ AMF ☐ FT ☐

REQUEST FROM ROCC: BLOCK CALLS ☐ CANCEL AUTOMATIC SIGNALS ☐ PROHIBIT EXITS ☐

RED HOT SPOT(s) TYPE/LOCATION(s): ☐ RED HOT SPOT HAZARDS ☐ ETS/RADIO OUTAGE ☐

FOUL TIME PROTECTION CAN BE REQUESTED IN ALL WORK ZONE CONFIGURATIONS

POWER OUTAGE: LOCK OUT TAG OUT ☐ RED TAG ☐ SUPERVISORY ☒ NO POWER OUTAGE ☐

RED TAG NUMBER: RED TAG HOLDER:

WATCHMAN/LOOKOUT ASSIGNED: Yes ☐ No ☒ WATCHMAN/LOOKOUT NAMES(s):

WATCHMAN/LOOKOUT EQUIPPED WITH AIR HORN AND WHISTLE ("W" Warning Disc required for fixed work zones): ☐

WATCHMAN/LOOKOUT MUST BE PROPERLY SPACED AND HAVE SUFFICIENT SIGHTING DISTANCE TO PROVIDE AMPLE WARNING

ADVANCE MOBILE FLAGGER ASSIGNED: Yes ☐ No ☒ ADVANCE MOBILE FLAGGER CALL #(s):

ADVANCE MOBILE FLAGGER EQUIPPED WITH AMBER LANTERNS/E-FLARES, ORANGE FLAG, AIR HORN, WHISTLE AND RADIO: ☐

PIGGY BACK CREW LEADER CALL #(s): ~ 1# PIGGY BACK WORKZONE CM(s): N/A

PIGGY BACK WORK ASSIGNMENT: N/A

NUMBER OF RMM(s): N/A RMM OPERATIONS IN WORK ZONE: N/A

ALL ROADWAY WORKERS MUST EXERCISE GOOD JUDGEMENT AND CONSIDER THE FOLLOWING POTENTIAL HAZARDS AND PROCEDURES BEFORE ENTERING THE ROADWAY:

WEATHER CONDITIONS	<input checked="" type="checkbox"/>	TRIPPING HAZARDS / UNEVEN WALKING SURFACES	<input checked="" type="checkbox"/>
TRACK GRADE AND VISIBILITY	<input checked="" type="checkbox"/>	POOR LIGHTING / TUNNEL AND VENT SHAFT(S)	<input checked="" type="checkbox"/>
HAZARDS ASSOCIATED WITH RAIL VEHICLE MOVEMENT	<input checked="" type="checkbox"/>	TRAIN / CURVE SPEED(S)	<input checked="" type="checkbox"/>
WORK SITE CONDITIONS AND ACTIVITIES	<input checked="" type="checkbox"/>	ETS BOX(S) LOCATIONS	<input checked="" type="checkbox"/>
EMERGENCY PROCEDURES	<input checked="" type="checkbox"/>	EQUIPMENT AND TOOL SAFETY	<input checked="" type="checkbox"/>
ADJACENT TRACK PROTECTION	<input checked="" type="checkbox"/>	ROTATION AND RELIEF PROCEDURES	<input checked="" type="checkbox"/>

Rv. 3 WMATA Roadway Job Safety Briefing Form, Date: November 2018

Attachment 3 – Page 1 of 2.

Date: 07/26/2021 Time: 01:08 hours.
Final Report Rev. 1 – Improper RWP
E21324

Drafted By: SAFE 705 – 09/12/2021
Reviewed By: SAFE 71 – 09/23/2021
Approved By: SAFE 71 – 09/24/2021

Page 22

Lessons Learned



LL 20210823—RWP Violation on the F line at L'Enfant Plaza Station (F03)

Incident Summary

This incident occurred during non-revieve service hours on the F-Line at L'Enfant Plaza Station (F03). At 0130 hours on the night of the incident Rail Operations Control Center (ROCC) notified SAFE of an RWP violation that occurred on the F-line at L'Enfant Plaza Station (F03). Early reports indicated that a Track and Structures (TRST) RWIC entered the roadway at F03 and hot-sticked the rail. However, the GOTRS request for the track cleaning work specified chain markers for the E-Line. ROCC had given the RWIC permission to enter the roadway in the area of the E-Line, as specified in the GOTRS request. ROCC recognized the discrepancy after the RWIC had hot stuck the F03 area. Shortly thereafter, the RWIC was taken out of service. There were no injuries or damage as result of this incident.

TRST immediately placed the incident under investigation. The investigation included interviews with the RWIC in question, and a review of the statements submitted by the RWIC and members of the crew. TRST also obtained and reviewed recordings of the RWIC's communications with ROCC, and DVR footage from the F03 platform.

Preliminary Findings

The findings of TRST's preliminary investigation revealed that multiple errors precipitated this incident.

1. There was conflicting information in the GOTRS request

The title of the GOTRS request stated that the track cleaning work was to be conducted on the F-Line. The request was entitled "TKMSE F03 STATION CLEANING TRACKS 1 & 2."

However, the request was actually for work to be conducted on the E-Line. The details in the request specified E-Line chain markers.

2: The RWIC noted that the title of the GOTRS request cited the F-Line, thus he reported to the F-Line. The ROCC noted the details in the request, thus ROCC gave the RWIC permission to access the E-Line.

RWIC requested permission to enter the F-Line. ROCC granted permission, but presumed the RWIC was on the E-Line.

LL# 20210823

August 23, 2021

Attachment 4 – Page 1 of 2.

LL 20210823—RWP Violation on the F line at L'Enfant Plaza Station (F03)

3: Subsequent Events

The discrepancy in the GOTRS request was discovered by the ROCC Controller when the RWIC reported that he hot-sticked rail on the F-line. The RWIC and ROCC failed to perform 100% repeat back in communicating with each other, which prevented both the RWIC and ROCC from detecting the mistake before the RWIC entered the wrong roadway.

In addition, it was later determined that the hot stick the RWIC was using was defective and therefore he mistakenly reported that the third rail at his location was de-energized.

Finally, DVR footage of the incident shows the RWIC failed to have on the proper PPE when hot-sticking the area. Had the Controller not caught the discrepancy when he did, the RWIC would have commenced work in an area with a fully-energized third rail, thereby endangering his life and the lives of his crew.

Root Cause/Contributing Factors

- Failure in Track Access, Maintenance and Construction (TAMC)/GOTRS review/approval process allowed rights to be approved with location and chain marker discrepancies.
- Failure in 100% repeat-back contributed to failure to identify the discrepancy before personnel entered the roadway.
- Situational awareness or lack of knowledge of physical characteristics of the roadway locations contributed to the RWIC not realizing protection was incorrect.
- Human performance error contributed to RWIC not identifying third rail was energized in his location.

Lessons Learned

WMATA expects its employees and contractors to strictly adhere to all of the Authority's roadway safety protocols at all times, because the inherent dangers of working on the roadway require nothing less than 100% compliance to keep personnel safe. Safety protocols provide multiple levels of protection so that in the case of an error, employees will remain protected. In this incident, multiple levels of protection failed, leading the RWIC to believe he was in a safe work area. The incident involved four major failures, to include the failure to:

- Verify the actual chain markers in GOTRS system prior to RWIC accessing the roadway.
- Establish positive communication through 100% repeat back with ROCC for confirmation.
- Follow the International Civil Aviation Organization (ICAO-Phonetic Alphabet) radio communication standard to ensure clear/precise radio communication on the roadway (e.g., use "FOXTROT" to indicate the letter "F").
- Test the hot stick on a viable live circuit before every use.

Had any one of these safety measures been taken, the incident would not have progressed as far as it did. The key lesson here is that *all* safety protocols for working on the roadway are critically important to prevent a tragedy from occurring.

LL# 20210823

August 23, 2021

Page 2

Attachment 4 – Page 2 of 2.

Appendix F – ROCC Communications Refresher Training



Use this Form for Reinstruction and Return to Duty (RTD)

Please Print all Information

Employee Name		Employee Number	Assigned Day	Last Day Worked
[REDACTED]		[REDACTED]	Fri/Sat	8/10/21
RTD Date*	Incident Date	Incident Type		
N/A	N/A	RWP Violation/ Radio Communications and ICAO Phonetic Usage		
Rule/Violation			Post Incident?	Date Cleared Medical
1.79, 1.79.3			N/A	N/A

Brief Synopsis of Incident or Reason Out

A Roadway Worker In Charge (RWIC) was granted foul time by the Rail Traffic Controller (RTC) to hot stick his work location between Mt. Vernon and Shaw Howard University. Radio communications/Repeat backs and ROCC foul time check list were followed. When the RWIC reported back to ROC, his hot-stick chain markers were not in the area in which he was granted permission for the foul time. The RWIC was instructed to clear the roadway. Further investigation revealed, during the initial GOTRS request, the RWIC and RTC both communicated two different work locations and neither individual caught the discrepancy. The RWIC was under the impression that his GOTRS rights were at L'Enfant Plaza (F03) due to the title heading on his GOTRS rights. The RTC repeated back the correct chain markers in GOTRS to the RWIC and received an acknowledgement with a request time, however, the RWIC did not repeat back the chain markers given by the RTC. This refresher was conducted to review the importance of clear and concise radio communications for accurate information and the importance of proper repeat backs when communicating.

Area Below for ROCC Manager Conducting Refresher Use Only

Date of Training: August 10, 2021

Instruction
Provided:

S.O.P #'s 1.79, 1.79.3/ Review of failed audit/ Radio audio/

How could incident have been prevented?

By Verifying the following:

- By listening carefully to the request made by the RWIC and completing proper repeat backs of radio transmissions
- Stating the station name utilizing the ICAO in conjunction with the chain markers when executing GOTRS request, giving permission to hot stick under foul time request, and radio communications for clarity

Competencies Observed: [REDACTED] was able to identify/execute/provide:

- How miscommunication errors can lead to more severe incidents
- The utilization of the ICAO when communicating for clarity
- Full repeat back of radio communications from both parties

RTC	[REDACTED]	Signature & Date	[REDACTED] 08-10-21
ROCC Manager	[REDACTED]	Signature & Date	[REDACTED] 8-10-21

Created February 2, 2021

Attachment 5 – Page 1 of 1.

Appendix G – ROCC Lessons Learned Improper Repeat Back & Incorrect Work Location



ROCC

Rail Operations Control Center

Incident Date:
July 26, 2021

LESSONS LEARNED

Improper Repeat Back and Incorrect Work Location

BACKGROUND:

On the morning of Monday, July 26, 2021, track rights had been established for station cleaning in the protected work area of E037+00 to E060+00 (Shaw Howard University Station) on the Echo Line. The GOTRS, however, contained a clerical error and listed "F03 Station Cleaning Tracks #1 & #2" in the header of the request details. This error led to the RWIC to request a supervisory outage at the incorrect location of L'Enfant Plaza, which is between the same chain markers of 037+00 and 060+00 on the Foxtrot Line. This work request error by the RWIC was not immediately caught by the controllers in the initial request for track access.

This is the initial radio communication:

RWIC: "Good evening Central, RWIC at this time requesting a supervisory outage F03, tracks #1 and #2, chain marker 037+00 to 060+00, how do you copy, that's track #1 and #2, over." [States "F" and does NOT use Foxtrot when requesting]

Central: "That's a good copy, and what's your roadway form of protection tonight, over?"

RWIC: "Supervisory, ETO."

Central: "That's a good copy, RWIC requesting supervisory power outage, ETO is your form of protection, you've got Echo #1 and #2 037+00, 060+00, got your request time at 23:44, stand by, stand clear, over"

RWIC: "23:24, stand by, stand clear."

Central: "23:44, over."

RWIC: "23:44, thank you Central."

Central: "A-firm."

As is noted in the above transmission, the initial outage request is not immediately repeated by the controller as is required by **MSRP 1.79: "Individual radio transmissions shall, at all times, be repeated by the receiver so the transmitter can confirm the message was received completely and by the intended receiver."** The controller instead says, "That's a good copy..." This same error is then committed by the RWIC, who misstates the request time as "23:24" and is corrected by the controller as "23:44." The RWIC does not repeat back "Echo #1 and #2 037+00, 060+00", as stated by the controller, and is not corrected.

At this point, two distinct opportunities to identify the work zone location error have been missed by not following full radio repeat back procedure. Both the controller and the RWIC believe they are setting up the correct work zone in two different locations, the controller on the Echo Line and the RWIC on the Foxtrot Line.

At approximately 1:08 hours, the RWIC contacts the controller again and requests foul time access to set up his work area. The RWIC repeats all signals given to him by the controller to include **Echo 03-08 and Echo 01-02**. There was no opportunity for the controller to correct the RWIC at this time since all signals are repeated back correctly by the RWIC. Then, a few minutes later, when the RWIC states his chain markers for the hot stick location, the controller recognizes that the personnel are at the wrong location and instructs the RWIC to landline Central.

Fortunately, no one was harmed in this incident.

INCIDENT ANALYSIS

Full and complete repeat back of all radio communications are a must in order to provide the highest level of safety to all personnel entering the roadway. By not following the full repeat back procedure in the initial radio transmission, an opportunity was missed by the controller to prevent personnel from entering the roadway at an incorrect location.

This incident is a perfect demonstration of how a simple, one-line clerical error in a document can magnify complacency. In this case, the RWIC put himself in harm's way by not fully examining all documentation and verifying the proper work location. The RWIC did not comprehend that he was in the wrong location when verifying and repeating back the red signals given to him by the controller for foul time protection. It was not until the full repeat back of the hot-sticking chain markers that the full magnitude of the error was identified.

DO NOT ALLOW COMPLACENCY TO

CLOUD YOUR JUDGEMENT, DO IT RIGHT,

EVERY TIME!

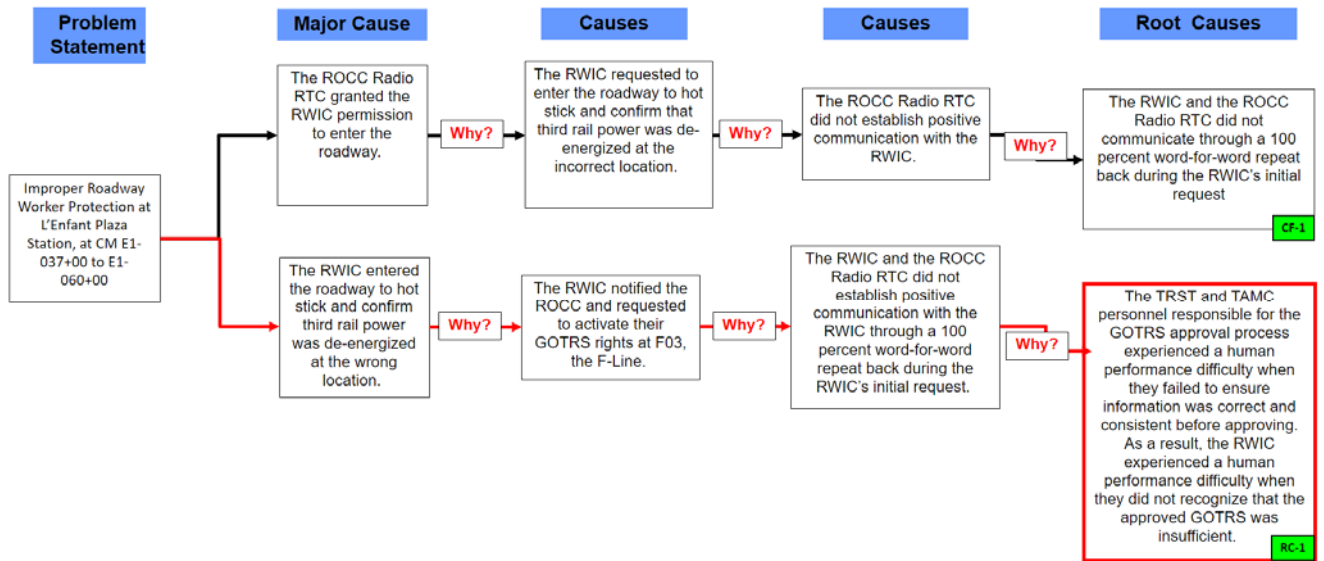
VERIFY ALL DOCUMENTATION AND REPEAT

BACK ALL RADIO COMMUNICATION.

LIVES DEPEND UPON IT

Attachment 6 – Page 1 of 1.

Appendix H - Root Cause Analysis



Root Cause Analysis

