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WMSC Commissioner Brief: W-0107 & W-0108 – Improper Roadway Worker Protection – Tenleytown Station – April 9, 2021

Prepared for Washington Metrorail Safety Commission meeting on September 21, 2021

Safety event summary:

A Roadway Worker in Charge (RWIC) establishing an Infrastructure Renewal Program Group (IRPG) work zone that included part of Tenleytown Station directed an Equipment Operator the RWIC was with on a Prime Mover work vehicle to travel beyond the RWIC's working limits and beyond the location the Rail Operations Control Center (ROCC) intended to specify for the RWIC, into another occupied work zone. The RWIC was intending to go to an additional location where hot sticking was required to confirm that power was down prior to the work crew entering the roadway; however, there was a miscommunication with the ROCC controller about the additional location to be checked to ensure the safety of the work crew. Specifically, the controller provided both the starting and ending chain markers for the segment of third rail that remained to be checked, and the RWIC understood that as meaning hot sticking was required at both of those chain markers, rather than the actual requirement to hot stick anywhere in that area. The near end of that third rail segment was within the RWIC's work area, while the far end was not. (First attached investigation report.)

During the investigation into this improper movement out of a work zone and into another work zone and the associated improper roadway worker protection, a separate improper roadway worker protection event that contributed to the event described above was identified involving the Plant Maintenance (PLNT) work crew in the work zone that the Prime Mover encroached upon. Investigators found that work crew, with working limits 300 feet from the end of the other crew's working limits, had not placed required shunts, lights or work mats that are designed to provide protections against improper movement into the work zone. The ROCC allowed the crew to work despite the PLNT RWIC stating that the required shunts were not in place that would indicate track occupancy to the signal system. The lights and work area mats that are required to be placed along with shunts would have indicated to the TRST RWIC and the Equipment Operator that the area was occupied. (Second attached investigation report.)

The PLNT RWIC reported the vehicle moving through the work zone to the ROCC, and stated that the work crew was in the vent and emergency egress shaft at the time.

The ROCC Radio Controller working at the time had certified approximately two months earlier, and said that they thought it was allowable for the PLNT RWIC to not set up their safety equipment because it is commonly done. The controller did not know that there were no handrails at the vent and emergency egress shaft, which means that those areas are part of the roadway and require roadway worker protection. Metrorail had also not communicated a September 18, 2020 lessons learned document to this controller that highlighted the importance of meeting the scheduled roadway worker protection level for each work zone.

In this case, the PLNT RWIC filled out the roadway job safety briefing form to reflect that exclusive track occupancy (ETO) was used, even though the protections were not actually established.

Probable Cause:

The probable cause of this improper roadway worker protection was Metrorail's practical drift from, and lack of supervisory oversight of, work zone safety practices to prevent deviations from these critical safety procedures, unclear procedures for work zone setup using a work unit, ineffective implementation of lessons learned from prior safety events, and unclear and inconsistent radio communication.

Corrective Actions:

Plant Maintenance developed and distributed a safety bulletin related to work zone setup, and discussed the bulletin in a safety stand-down with RWP level 2 and level 4 qualified PLNT employees. The stand-down focused on the requirement to set up work areas as defined in the General Orders and Track Rights System (GOTRS) request for that work.

The Safety Department will develop and distribute a bulletin to all RWP-trained personnel outlining best practices for reviewing and using GOTRS to set up work areas.

The Safety Department issued a Safety Bulletin stating that RWICs may not "downgrade" or alter safety equipment requirements.

ROCC controllers on the overnight (owl) shift received additional training on overnight shift operations and clear and specific communications required to setup work locations.

The RWICs involved received refresher training.

WMSC staff observations:

"Downgrading" roadway worker protection is not acceptable, and is not permitted, however the WMSC has observed this more than once. Metrorail personnel have told the WMSC this occurs on a somewhat frequent basis, personnel are informally told this is acceptable, and it is permitted by the ROCC. This was acknowledged during this investigation as being a regular practice. While Metrorail personnel attempt to refer to this as 'downgrading,' it is actually removing protection. The PLNT job safety briefing form in this event specified that this was conducted as exclusive track occupancy, however those protections were not established. This lack of protection included the PLNT crew not placing Warning Strobe and Alarm Devices (WSADs) on the roadway that are designed to warn roadway workers if third rail power is restored.

Metrorail has open CAPs related to the Roadway Worker Protection (RWP) Audit issued in 2020, and is in the process of significant RWP rule and procedure updates. These updates include changes intended to define processes for establishing work zones using a work unit. Each of these updates, including aspects that remain the same as current rules, will require significant training for all personnel to ensure the complete understanding that is required to keep personnel safe. Metrorail's ongoing acceptance of deviations from these safety procedures led the RWIC and rail controller to allow work to be conducted by the PLNT crew without proper protections, and to no other members of the work crew identifying this hazard and reporting it, including through the good faith challenge process. Metrorail expects to conduct a safety stand-down related to RWP in coming weeks.

This event is one of several that the WMSC has observed that suggest there may be insufficient initial and recurring physical characteristics training and knowledge requirements for at least some Metrorail personnel to properly understand and identify critical elements of territory that they work on or may work on.

Metrorail has an open CAP related to radio communication. Although there has been significant improvement over the last several years, it is imperative that Metrorail continue to improve radio discipline even after that CAP is closed. Metrorail could also improve communication through more standardized language and terminology.

This event highlights opportunities to better communicate about gaps in the third rail. For example, GOTRS changes could be considered to provide this information automatically, or controllers can otherwise mention only those gaps that are in the work area.

The investigation also confirmed gaps in Metrorail's 'lessons learned' documents, which have been noted previously by WMSC Commissioners. Lessons learned that are clear, understandable and otherwise effectively developed and distributed can serve as immediate interim mitigations in some cases to reduce the risk of recurrence, however it is important that each of these lessons be incorporated into regular training and supervision so that the organization as a whole truly learns the lessons from each safety event, near miss or other triggering cause of a 'lessons learned' document. Metrorail is in the process of implementing a "MetroDocs" document control system that is designed to electronically capture document transmission and employee sign-off.

Metrorail did not remove ROCC personnel, or the PLNT RWIC from service for post event testing as required by Metrorail policies. Similar issues were covered in the WMSC's Fitness for Duty Audit issued in August 2021.

WMATA did not notify the WMSC within two hours of this event as required. The improper prime mover movement occurred at approximately 2:14 a.m. Metrorail notified the WMSC of the event at 4:48 a.m.

Staff recommendation: Adopt final report.

Washington Metro Area Transit Authority

Department of Safety and Environmental

Management (SAFE)

FINAL REPORT OF INVESTIGATION A&I E21137

Date of Event:	04/09/2021
Type of Event:	Improper Roadway Worker Protection (RWP)
Incident Time:	02:14 hours
Location:	Tenleytown-AU Station, Track 1, Chain Marker (CM) 268+00
Time and How received by SAFE:	03:05 hours – SAFE On-Call Phone
WMSC Notification Time:	04:48 hours
Responding Safety Officers:	WMATA: No WMSC: No Other: No
Rail Vehicle:	Prime Mover (PM) 54
Injuries:	None
Damage:	None
SMS I/A Incident Number:	20210409#92712

Tenleytown-AU Station – Improper Roadway Worker Protection (RWP)

April 9, 2021

Table of Contents

Abbreviations and Acronyms

AIMS	Advanced Information Management System
ARS	Audio Recording System
CAP	Corrective Action Plan
CAPD	Office of Capital Program Delivery
CM	Chain Marker
ETO	Exclusive Track Occupancy
FT	Foul Time
GOTRS	General Orders & Track Rights System
I/A	Incidents/Accidents
MSRPH	Metrorail Safety Rules and Procedures Handbook
NOAA	National Oceanic and Atmospheric Administration
PICO	Project Implementation and Construction
PLNT	Office of Plant Maintenance
PM	Prime Mover
RJSB	Roadway Job Safety Briefing
ROCC	Rail Operations Control Center
RTC	Radio Traffic Controller
RWIC	Roadway Worker In Charge
SAFE	Department of Safety and Environmental Management
SAFTE-FAST	Sleep, Activity, Fatigue and Task Effectiveness - Fatigue Avoidance Scheduling Tool
SMS	Safety Measurement System
SRC	Safety Risk Coordinator
TRST	Office of Track and Structures
WMATA	Washington Metropolitan Area Transit Authority
WMSC	Washington Metrorail Safety Commission
WSAD	Warning Strobe and Alarm Device

Executive Summary

On Friday, April 9, 2021, at approximately 02:14 hours, a New Carrollton Division, Office of Track and Structures (TRST) employee performing Roadway Worker in Charge (RWIC) duties was traveling onboard Prime Mover (PM) 54 and exceeded their authorized working limits. The RWIC was utilizing PM 54 to set up a work zone at Chain Markers (CMs) A1-192+00 to A1-268+00 and attempting to perform third rail hot stick operations on gaps within the work area. The RWIC was contacted by the Rail Traffic Controller (RTC) and advised PM 54 had traveled beyond their working limits. The Rail Operations Control Center (ROCC) contacted SAFE at approximately 03:05 hours to report the incident. The RWIC was removed from service for post-incident testing. There were no injuries or equipment damage reported as a result of this incident.

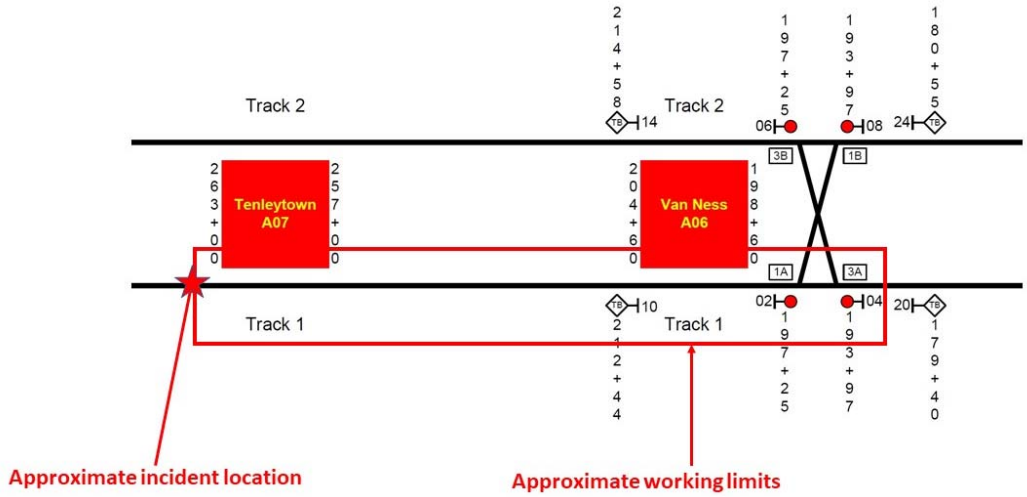
The Audio Recording System (ARS) playback [radio and landline] indicated that the RWIC contacted the ROCC to report the CM locations where they hot sticked. After verifying the hot stick locations, the RTC advised the RWIC there was an additional gap within their work zone and a hot stick check needed to be performed between CM A1-256+50 and A1-308+31. The RWIC responded and stated they were not working that far into the work area, which ended at CM A1-268+00. The ROCC advised the RWIC that all gaps needed to be checked within their work area. The RWIC then requested to utilize PM54 to travel to CM 308+31 to hot stick. ROCC asked if the RWIC relinquished their Foul Time (FT) and was subsequently permitted to utilize PM54 to check their gaps in the third rail. Upon approaching the end of their work area, the ROCC contacted the RWIC to ascertain if they were within their authorized working limits. The RWIC stated they asked if they could utilize PM54 to go to CM 308+31 to hot stick. The ROCC informed the RWIC that they must stay within their working limits and informed the RWIC to contact the ROCC via landline. The RWIC stated they asked for permission to use PM 54 and proceed to CM A1-308+31 to check their gaps which were outside of their working limits. At approximately 02:24 hours, the ROCC received a call via landline from an Office of Plant Maintenance (PLNT) stating a PM had traveled through their work area. The RWIC was removed from service by TRST Management. The Equipment Operator was determined to have followed instructions from the RWIC and was not removed from service.

The probable cause of the incident was unclear procedures for roadway work crews to set up a work zone protection using a prime mover to traverse the intended working limits. Contributing factors to the incident were human performance difficulties related to identifying third rail gaps within the work area and an incorrect belief that permission was given to proceed beyond the working limits An additional contributing factor included an improper work zone setup from a work crew in the adjacent area. While another work crew had a protected work area from CM A1 271+00 to 283+00, located just beyond the RWIC's work area, the crew did not install the required safety equipment on the roadway to ensure the work area was visible.

Incident Site

Tenleytown-AU Station, Track 1, CM 268+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.

Investigative Methods

The investigative methodologies included the following:

- Physical Site Assessment

- Formal Interviews – SAFE interviewed two individuals as part of this investigation. Interviews included persons present at, during, and after the reported incident. Representatives from the Washington Metrorail Safety Commission (WMSC) participated. SAFE interviewed the following individuals:
    - Roadway Worker in Charge (RWIC)
    - Rail Traffic Controller (RTC)

- Documentation Review – Collection of relevant work history information and process documentation contained in WMATA systems of record. These records include:
    - RWIC Training Records
    - RWIC Certifications
    - RWIC 30-Day work history review
    - RTC Training Records
    - RTC Certifications
    - RTC 30-Day work history review
    - Metrorail Safety Rules and Procedures Handbook (MSRPH)
    - National Oceanic Atmospheric Administration (NOAA)
    - Rail Operations Control Center (ROCC) Incident Report
    - Roadway Job Safety Briefing (RJSB)

- System Data Recording Review – Collection of information contained in Metro Data Recording Systems. This data includes:

- ARS (Audio Recording System) playback [Radio and Landline Communications]
- Advanced Information Management System (AIMS) Playback

Investigation

Based on findings, at approximately 02:14 hours, a New Carrollton Division, TRST employee performing RWIC duties was traveling onboard PM54 and exceeded their authorized working limits. The RWIC was setting up a work zone between Chain Markers (CMs) A1-192+00 to A1-268+00 and attempting to perform third rail hot stick operations on gaps within the work area. The RWIC contacted the ROCC and reported they hot sticked the following locations: CMs A1-197+26, A1-205+10, A1-205+66, A1-230+90, A1-231+46, A1-255+57, A1-255+85 and A1-256+22. After ROCC verified the CM locations, the RTC informed the RWIC they have a gap within their work area at CM A1-256+50 to A1-308+31. However, further investigation of the Contact Rail Drawing revealed the third rail gap was, in fact, at CM A1-256+50 to A1-305+31. This portion of rail would have allowed the RWIC to hot stick the gap while remaining within their working limits. The RWIC requested to use PM54 to check the remainder of their gaps at CM A1-308+31. The ROCC ascertained if the RWIC's FT was relinquished. The RWIC affirmed and was granted permission to utilize PM54 to check their remaining gaps. The ROCC noted PM54 was traveling close to the end of their working limits and contacted the RWIC via radio. The RWIC asked if they had permission to travel to CM A1-308+31. The ROCC informed the RWIC they needed to remain within their working limits. The ROCC then requested the RWIC to contact the ROCC via landline after the AIMS displayed PM54 outside of their working limits.

The RWIC reported via landline that the ROCC had given them permission to travel outside of their working limits to CM A1-308+31; however, the ROCC stated they permitted the RWIC to utilize PM54 to check the remaining third rail gaps within their working limits only. While PM54 exceed their working limits, PLNT personnel were performing repairs on the egress stairway (not on the roadway) within their protected area at CM A1-271+00 to A1-283+00 and witnessed PM54 traveling through their work area. PLNT contacted the ROCC via landline to advise them of the incident. The ROCC contacted SAFE at approximately 03:05 hours to report the incident. The RWIC was removed from service for post-incident testing.

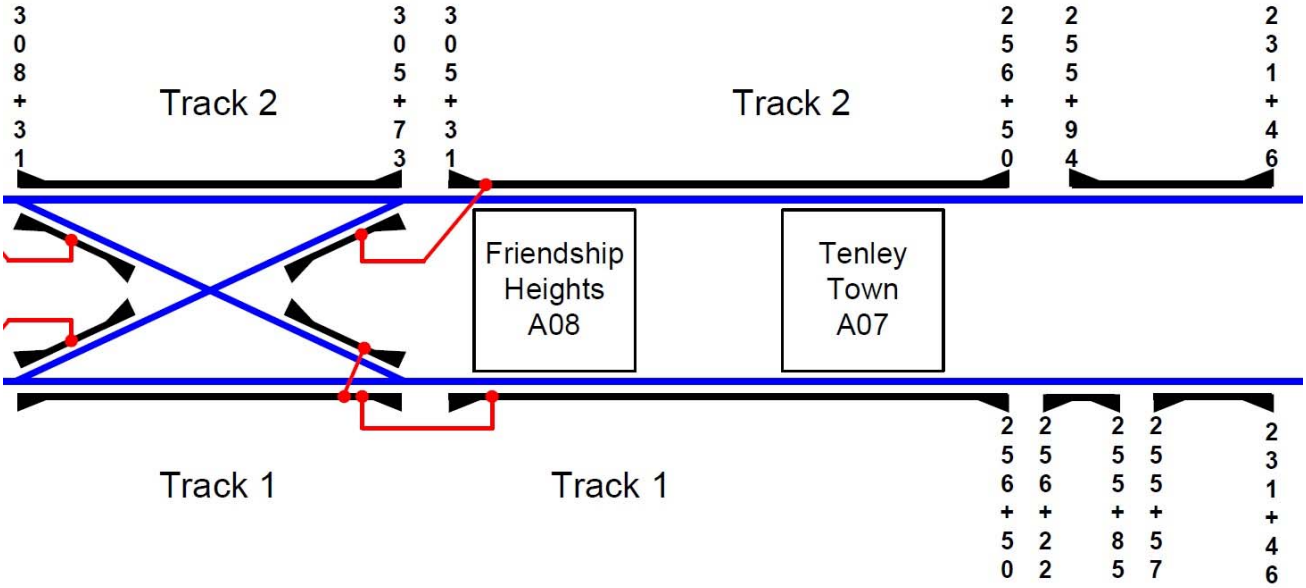


Diagram 1 – Contact Rail Drawing shows a third rail gap from CM A1 256+22 to 256+50. RWIC protected work area included CM A1 191+00 to 268+00.

Chronological Event Timeline

ARS playback revealed the RWIC conducted hot stick operations to set up the work zone. After reporting the CMs to the ROCC, the ROCC advised there was a third rail gap within their work area that needed to be checked. The RWIC asked to use PM54 to travel to CM A1-308+31, which was outside of their work area. The RTC noticed the RWIC was approaching the end of their working limits via AIMS and contacted the RWIC via radio. The RTC instructed the RWIC to operate within the working limits only. The RWIC was subsequently informed to contact ROCC via landline. The RWIC stated they asked if they could utilize PM54 to go to CM A1-308+31 to hot stick. The ROCC informed the RWIC they should have remained within their working limits and to standby. The ROCC then received a call via landline from a PLNT employee stating a PM traveled through their work area.

Time	Description
02:10:42 hrs.	RWIC: “Central, 6122.” [Radio]
02:10:45 hours	ROCC: “Go ahead with your message, 6122, over.” [Radio]
02:10:52 hours	RWIC: “Central, I have the remaining CMs whenever you’re ready.” [Radio]
02:10:55 hours	ROCC: “Go ahead, over.” [Radio]
02:11:00 hours	RWIC: “Repeat that Central.” [Radio]
02:11:02 hours	ROCC: “Go ahead with them CMs, over.” [Radio]
02:11:05 hours	RWIC: “Alright I got, A, A197+22, I mean 26. I got. 205+66, 231+46, 255+85, 256+50, +10, 230+90, 255+57 and 256+22. That’s ah, Track 1, Track 1 only. How you copy?” [Radio]
02:11:37 hours	ROCC: “Alright standby. Let me just double check those CMs real quick, over.” [Radio]
02:11:42 hours	RWIC: “Copy.” [Radio]
02:11:45 hours	ROCC: “6122, did you give at CM, what was that last CM you gave me, over?”
02:11:52 hours	RWIC: “That was 256+22.” [Radio]
02:11:56 hours	ROCC: “Alright you got a gap, or you got a CM between A1 256+50 and A1 308+31, over?” [Radio]
02:12:06 hours	RWIC: “Oh, my work area stops at 268 so, that’s why I didn’t hot stick that one. I wasn’t going down that far.” [Radio]
02:12:14 hours	ROCC: “That’s affirm. But ah, you still got that gap and as long as any part of that gap is in your work location, I need you to hot stick. So, it’s going to be between CM.” [Radio]
02:12:26 hours	ROCC: “Central out.” [Radio]
02:12:45 hours	RWIC: “Hey Central. This 6122.” [Radio]
02:12:48 hours	ROCC: “Go ahead 6211, over.” [Radio]
02:12:44 hours	RWIC: “Can I utilize the 54 to go down to that CM. Not passing no signals Red signals.” [Radio]
02:13:01 hours	ROCC: “6122, you already relinquish your FT, over?” [Radio]
02:13:06 hours	RWIC: “Affirm.”

02:13:08 hours	ROCC: “Alright that’s affirmative. You have permission to utilize your unit to check the remainder of your gaps. At no time does your unit have permission to pass red signals, over.” [Radio]
02:13:18 hours	RWIC: “No time unit pass red signals.” [Radio]
02:13:24 hours	ROCC: “That affirm. Central’s out.” [Radio]
02:14:48 hours	AIMS: Playback indicated PM54 exceeded their working limits and encroached PLNT’s work zone.
02:16:04 hours	ROCC: “6122, come into Central, over.” [Radio]
02:16:12 hours	RWIC: 6122, go ahead. [Radio]
02:16:24 hours	RWIC: 6122, go. [Radio]
02:16:29 hours	ROCC: “Just to verify that you’re still within your working limits. That PM 54 appears to be moving towards the end of your working limits, over.” [Radio]
02:16:44 hours	RWIC: “Yeah. I asked you can I utilize it to go down to 308.” [Radio]
02:16:51 hours	ROCC: “Negative, you need to remain within your working limits, over.” [Radio]
02:16:57 hours	RWIC: “Roger.” [Radio]
02:17:00 hours	ROCC: AIMS displays PM54 outside of their working limits. ROCC instructed PM54 to stop. PLNT personnel reports PM54 traveled through their work location without permission. (PLNT protected area included CM A1-271+00 to A1-283+00. PLNT did not have personnel working in the roadway; tracks were down for safety purposes). [ROCC Incident Report]
02:17:08 hours	ROCC: “How do you copy?” [Radio]
02:17:12 hours	RWIC: “6122. Copy Central.” [Radio]
02:17:16 hours	ROCC: “PM 54. Come into Central, over.” [Radio]
02:17:27 hours	RWIC: “Control. PM 54.” [Radio]
02:17:30 hours	ROCC: “Disregard, I got you within your limits. Appreciate PM 54. Just remain within your working limits, over.” [Radio]
02:17:37 hours	RWIC: “Affirm. I’ll give you a landline in a minute.” [Radio]
02:17:48 hours	ROCC: “Alright. 6122, you need to give Central a landline, over.” [Radio]
02:18:29 hours	RWIC: “Central, this is 6122.” ROCC: “Yes.” RWIC: “I was asked to give Central a landline.” ROCC: “You left within your work location. Your CMs.” RWIC: “That’s why I called on the radio. That’s why I asked him can I utilize the unit to go down to check the remaining gap. 308. He told me I had permission. That’s why I asked him that. Because it was a long walk.” ROCC: “Because 308. Your CM went to 268.” RWIC: “268, yeah. Then I ask him can I utilize 54 to go down and check that gap at 308. And he told me yeah.” ROCC: “Hold on.” [Landline]

02:23:00 hours	ROCC: The ROCC verified all personnel were clear of the roadway and instructed the RWIC to return to Van Ness Station. The ROCC placed all work locations on delay pending investigation. [ROCC Incident Report]
04:09:00 hours	RWIC: The RWIC was removed from service for post incident testing and instructed to submit an incident report. [ROCC Incident Report]

Advanced Information Management System (AIMS) Playback

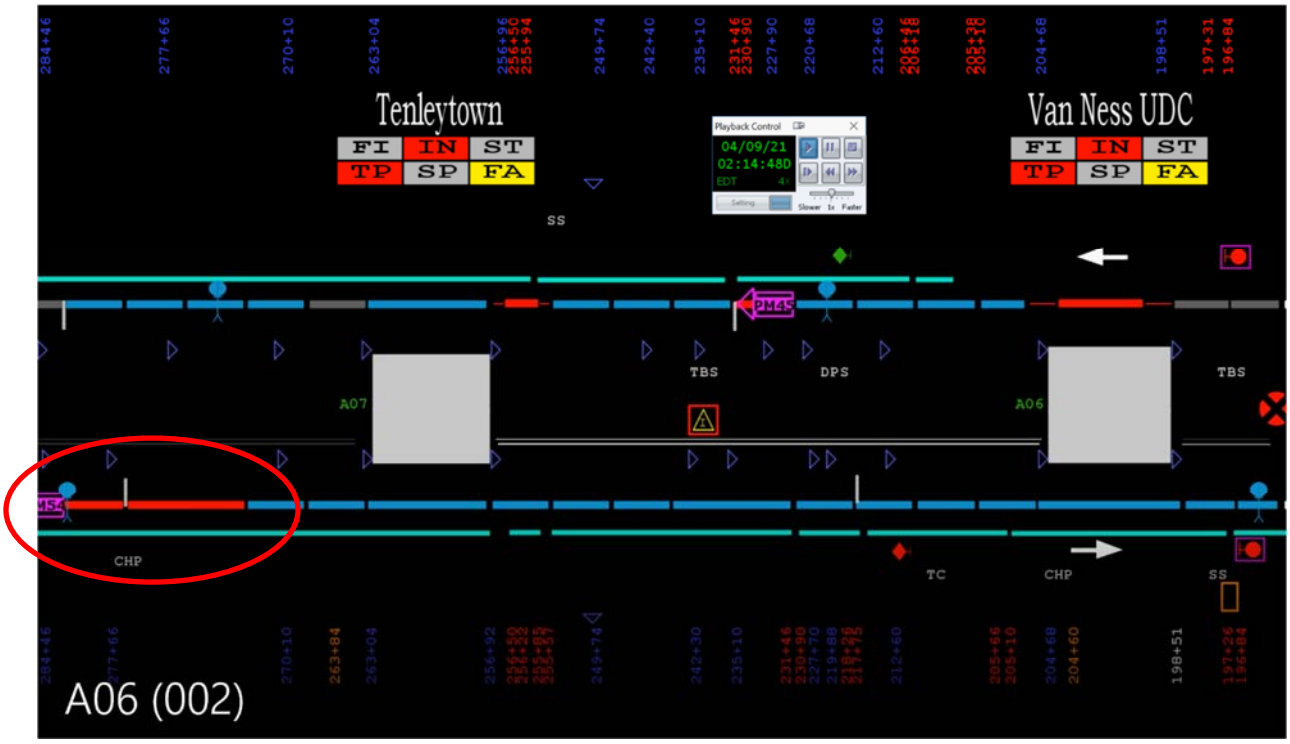


Diagram 2 – AIMS playback illustrating PM 54 exceeding their working limits and encroaching PLNT's work zone at 02:14:48 hours.

Interview Findings

Based on the investigation launched into the improper RWP incident at Tenleytown-AU Station, SAFE conducted a formal interview with the RWIC via Microsoft Teams, which included the investigation team, relevant Metro personnel and representatives from the WMSC. The interview conducted identified the following key findings associated with this event:

The RWIC reported they interpreted the instructions from the ROCC as giving them permission to use PM54 to hot stick the third rail at CM A1-308+31, which was outside of their working limits. The RWIC stated the lack of complete and thorough communications contributed to the incident.

RTC reported the PLNT work crew did not set up safety equipment because they were not working on the roadway. The RTC stated when units are not working in the roadway, they do not require them to set up safety equipment. The RTC stated the PLNT work crew was under supervisory power outage and requested Exclusive Track Occupancy (ETO) protection. Safety equipment is required to be used under ETO protection. However, safety is a requirement for all work protection categories and should have been installed.

Weather

At the time of the incident, NOAA recorded the temperature at 57° F, winds South to North at 5 mph, mostly cloudy with visibility of 10 miles. Humidity was at 67%. Based on findings, SAFE has concluded that weather was not a contributing factor in this incident (Weather source: NOAA – Location: Washington, DC.)

Human Factors

Fatigue

TRST RWIC

Evidence of Fatigue:

The incident data was evaluated for evidence of fatigue that may have been present at the time of the incident. No video of the involved person was available to ascertain whether evidence of fatigue was present. The employee 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 incident data was evaluated for fatigue risk factors. Risk factors for fatigue were present. The incident occurred at a time of low circadian alertness. The employee reported keeping a regular sleep schedule in the days leading up to the incident. The off-duty period preceding the incident was 15.75 hours long, which provides an opportunity for adequate sleep. The employee worked night shifts (22:00 – 06:00) in the days leading up to the incident. The employee was awake for 5.2 hours at the time of the incident and reported a total of 10.25 hours of sleep in the 24 hours preceding the incident. The employee reported that this was comparable to the amount of sleep on a typical workday. The employee reported no issues with sleep.

Since a fatigue risk factor was present, a biomathematical fatigue modeling application titled the Sleep, Activity, Fatigue and Task Effectiveness - Fatigue Avoidance Scheduling Tool (SAFTE-FAST) was used to further evaluate fatigue risk factors that may have been present in the employee's schedule. The analysis was based on the employee's work schedule, bed and wake times from the day before the incident and reported habitual sleep durations. Estimated performance effectiveness at the time of the incident was 78%. The analysis confirmed time of day (i.e. performance impacted by the time of circadian low) as contributing to an increased risk of impaired performance at the time of the incident.

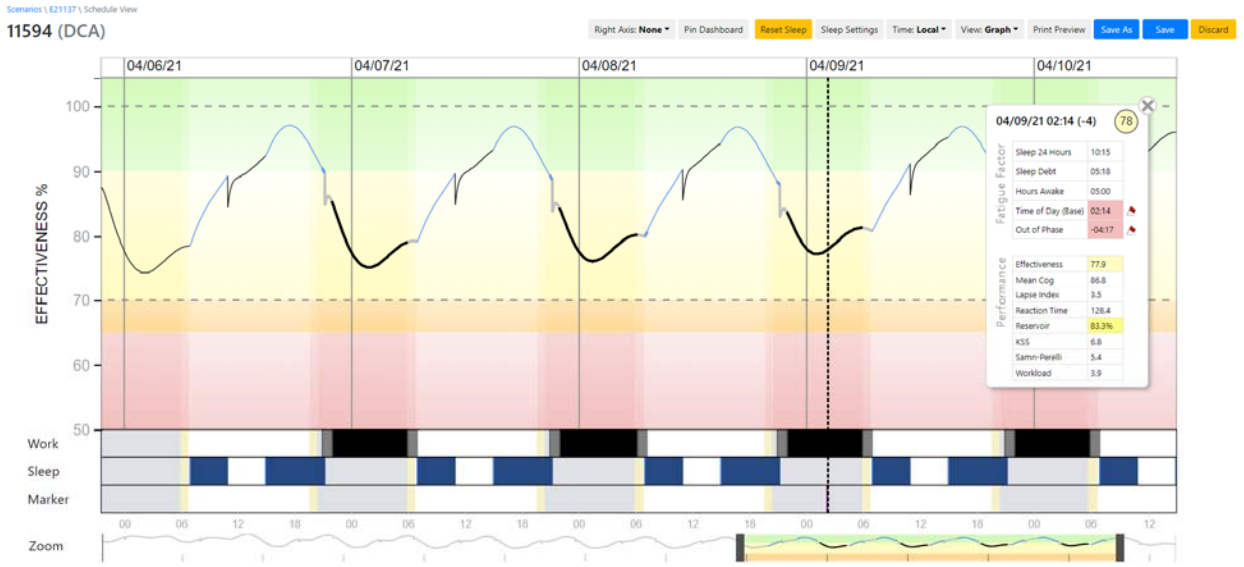


Figure 1 - Modeling analysis output shows estimated performance effectiveness for the period leading up to the incident, based on the employee work and reported sleep schedule. Estimates were based on the employee's work schedule, bed and wake times from the day before the incident and reported habitual sleep durations (10.25 hours a day, split in two periods). Bold portions of the modeled curve show work (in black) and sleep times (in blue). Effectiveness is shown on the vertical axis, with colored fields in the chart background signifying ranges of effectiveness scores including high effectiveness (>90%) in green, and low effectiveness (<65%) in red. Time is shown on the horizontal axis. Markers for work and sleep times are shown in the lanes above the time of day on the horizontal axis.

ROCC Radio RTC

Evidence of Fatigue:

Fatigue Risk:

The incident data was evaluated for fatigue risk factors. Risk factors for fatigue were present. The incident occurred at a time of low circadian alertness. The employee reported keeping a regular sleep schedule in the days leading up to the incident, including maintaining the daytime sleep schedule during regular days off that preceded the incident shift. The employee worked nights in the week leading up to the incident.

The incident occurred on the first night shift after four nights off. The employee was awake for 12.2 hours at the time of the incident. The employee reported 8 hours of sleep in the 24 hours preceding the incident. This was comparable to the employee's usual workday sleep durations. The preceding off-duty period was over four days in duration, which provided an opportunity for adequate sleep before the shift. The employee reported no issues with sleep.

Since a fatigue risk factor was present, SAFTE-FAST was used to further evaluate fatigue risk factors that may have been present in the employee's schedule. The analysis was based on the employee's work schedule, bed and wake times from the day before the incident and reported habitual sleep durations. Despite the time of day, the estimated performance effectiveness at the time of the incident was 99%. This may be due to the effect of the controller's sleep schedule in the week leading up to the event. Maintaining a daytime sleep schedule can help shift the circadian clock into a better alignment with the night work schedule.

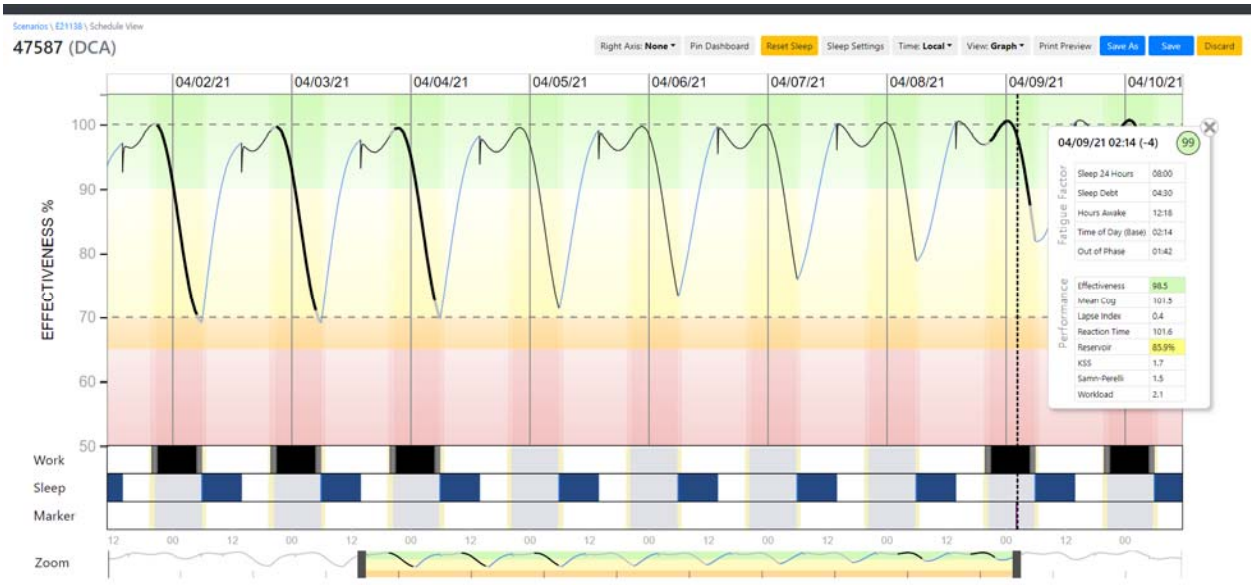


Figure 2 - Modeling analysis output shows estimated performance effectiveness for the period leading up to the incident, based on the employee work and reported sleep schedule. Estimates were based on the employee's work schedule, bed and wake times from the day before the incident and reported habitual sleep durations (10.25 hours a day, split in two periods). Bold portions of the modeled curve show work (in black) and sleep times (in blue). Effectiveness is shown on the vertical axis, with colored fields in the chart background signifying ranges of effectiveness scores including high effectiveness (>90%) in green, and low effectiveness (<65%) in red. Time is shown on the horizontal axis. Markers for work and sleep times are shown in the lanes above the time of day on the horizontal axis.

Post-Incident Toxicology Testing

WMATA's Drug and Alcohol Program determined that the RWIC was not in violation of the Drug and Alcohol Policy and Testing Program 7.7.3/6.

At the time of this incident, the ROCC RTC was not removed from service for post-incident toxicology testing. Based on SAFE's investigative findings and Metro's Drug and Alcohol Policy, the ROCC RTC and Equipment Operator of PM 54 should have been removed from service for post-incident testing given the known facts at the time of the incident. Under WMATA's current Drug and Alcohol Policy and Testing Program Policy Instruction 7.7.3/6, post-incident testing may be performed on employees and contractors whose performance cannot be "completely discounted" as a contributor to an event.

Findings

- No video recording available on PM54.
- The RWIC experienced a human performance difficulty when they were unable to identify and hot stick all the third rail gaps within their working limits while setting up the work zone.
- The RTC provided unclear procedures for roadway work crews to set up a work zone protection using PM54 to traverse the intended working limits.
- The RWIC incorrectly understood that they were given clearance by the RTC to proceed beyond their intended working limits in order to hot stick a gap within the work zone.
- The RWIC exceeded their protected area by traveling beyond the established working limits authorized by the ROCC.

- The RWIC used PM54 to travel beyond their work zone and unknowingly entered the adjacent work zone without contacting the PLNT-RWIC (refer to E21138 - 20210409 - Draft Final Report - Tenleytown-AU Station - Improper RWP).
- An adjacent PLNT personnel work crew were conducting emergency egress stairs repair at Fan Shaft 10 within their protected work area at CM A1-271+00 – A1-283+00.The PLNT-RWIC experienced a human performance difficulty when they were unable to properly setup the appropriate RWP work location for the nature of work. This Improper RWP setup contributed to PM54 operating through the PLNT-RWIC's work zone without contacting or having permission from the PLNT-RWIC as the work zone was not physically marked (e.g., mats) on the roadway. (refer to E21138 - 20210409 - Draft Final Report - Tenleytown-AU Station - Improper RWP).
- RJSB was not properly completed and did not contain information for Working Limits Chain Markers.
- This event is comprised of a two-side deficiency and its related to E21138.

Immediate Mitigation to Prevent Recurrence

- The TRST work crew was cleared from the roadway by ROCC.
- The TRST RWIC was removed from service for post-incident toxicology testing.

Probable Cause Statement

The probable cause of the incident was unclear procedures for roadway work crews to set up a work zone using a prime mover to traverse the intended working limits. Contributing factors to the incident were human performance difficulties related to identifying third rail gaps within the work area and an incorrect belief that permission was given to proceed beyond the working limits An additional contributing factor included an improper work zone setup from a work crew in the adjacent area. While another work crew had a protected work area from CM A1 271+00 to 283+00, located just beyond the RWIC's work area, the crew did not install the required safety equipment on the roadway to ensure the work area was visible.

SAFE Recommendations/Corrective Actions

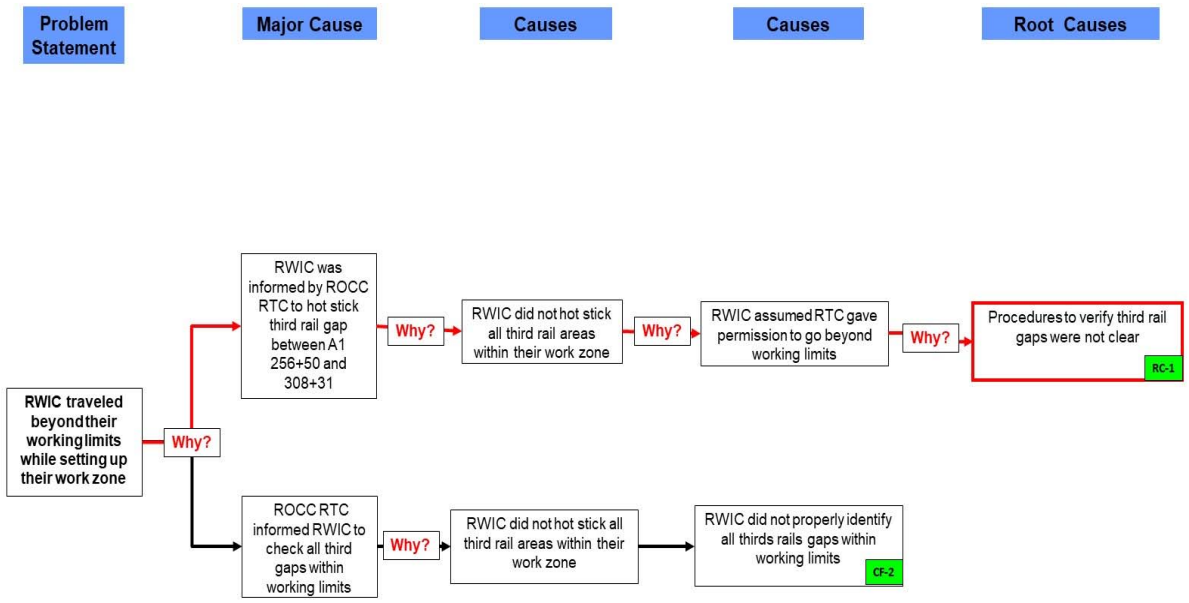
The following are the recommendations and corrective actions identified as a result of this investigation. These recommendations and corrective actions are tracked using WMATA's Safety Measurement System Incidents/Accidents (SMS I/A) Module and are verified by SAFE upon completion. The responsible department 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
92712_SAFECAPS_TRST_001	(RC-1, CF-1) Office of Track and Structures (TRST) will ensure RWIC receives RWP-4 refresher training.	TRST SRC	10/1/2021
92712_SAFECAPS_SAFE_001	As part of the MRSPH revision, SAFE will ensure procedures for utilizing prime movers to setup work areas are established and implemented.	SAFE SRC	11/1/2021

Corrective Action Code	Description	Responsible Party	Due Date
92712_SAFE CAPS_SAFE _002	SAFE to develop and distribute a bulletin to all RWP-trained personnel, outlining best practices for reviewing and using GOTRS to set up work areas.	SAFE SRC	10/1/2021
92712_SAFE CAPS_SAFE _003	SAFE issued Safety Bulletin #21-06a, "ROADWAY-WORKER-IN-CHARGE (RWIC) Responsibilities" which reemphasizes the RWIC's primary duties and that personnel are not free to "downgrade" or alter safety equipment requirements when setting up a work area.	SAFE SRC	6/30/2021 (complete)

Appendices

Appendix A - Root Cause Analysis



Root Cause Analysis

Appendix B – Interview Summary

The below narratives are summaries of the interviews with SAFE and represent the statements made by the involved individuals. As such, times and details may present a conflict with the data contained in systems of record.

TRST RWIC

This employee is a WMATA Structural Repair "BC" Mechanic with eight years of experience and three years of service as a "D" Mechanic. The RWIC's last RWP certification was on August 6, 2020, as a Level 4. This employee has no history of sleep issues to report.

The RWIC reported their assignment was to set up a work zone for contractors who were installing cables. After the RWIC conducted the Roadway Job Safety Briefing (RJSB) with the work crew of 11 members, they began to hot stick within the working limits to ensure third rail power had been de-energized. After they hot sticked the last location, the RWIC stated they contacted the ROCC to report the hot stick locations. The RWIC reported the ROCC verified their locations and stated there was an additional gap within their working limits that needed to be checked. The RWIC reported they asked the ROCC to utilize PM54 to conduct a hot stick at CM A1-308+31. While traveling to CM A1-308+31, the RWIC stated the ROCC contacted them and advised them to contact the ROCC via landline. On the landline, the RWIC reported explaining to the ROCC they were given permission to use PM54 to hot stick the gap at CM A1-308+31, which was outside of their working limits. The RWIC stated they think lack of communications contributed to the incident. The RWIC added they think better communications could have prevented this incident from occurring.

ROCC Radio RTC

This employee is a WMATA Rail Traffic Controller with one year of service. The RTC's last ROCC Controller Certification was on November 9, 2020, and RWP certification was on February 7, 2020, as a Level 2. They have no history of sleep issues to report.

Based on the SAFE interview, the RTC reported there was a PLNT unit working at Tenleytown with GOTRS Rights on Tracks 1 and 2. After PLNT hot sticked, the RTC reported the PLNT work crew did not set up safety equipment because they were not working on the roadway. The RTC stated when units are not working in the roadway, they do not require them to set up safety equipment. The RTC reported there was another work crew working nearby that went outside of their working limits and could not see they were entering another protected work area due to safety equipment not being installed. The RTC stated the PLNT work crew was under supervisory power outage and requested ETO protection. The RTC reported they knew the correct setup for ETO protection.

Appendix C – PLNT - General Orders & Track Rights System (GOTRS) Request

GOTRS - GENERAL ORDERS & TRACK RIGHTS SYSTEM
Track Rights Request

Request Summary

Request Number:	202108403103	**Track Access:**	True
Dates Requested:	04/09/2021 00:30 to: 04/09/2021 04:00	**Clear In Ten:**	False
Request Status:	Closed	**Equipment on Track:**	1
Requestor:	[redacted]	**Allow Piggybacks:**	True
Requestor Organization:	PLNT/BMSS	**In Piggyback:**	No
Switch Order:		**Power Outage:**	Supervisory
Lock Out / Tag Out:		**Additional AC:**	
Request Title:	A07 TENLEYTOWN FA10 EMERGENCY EGRESS STAIRS REPAIR		

Location, Work Type and Description

Location:	Mainline
Non-Wayside Location Type:	
Request Type:	Expedited
Charge Job Number:	200022
Contract Number:	
Maximo Work Order:	
Request Group:	No
Location Description:	
Request Description:	EMERGENCY REPAIR OF EGRESS STAIRS FOR FA10
Work Type:	Fan/Vent Shaft
Meeting Location:	
PB Meeting Location:	
Tools and Equipment:	PM34, SAFETY EQUIPMENT, HAND TOOLS, WELDING EQUIPMENT
Equipment on Track:	PM34 OUT OF E99

Track 1			Track 2		
Actual Work Area:	A276+00	A278+00	**Actual Work Area:**	A276+00	A278+00
Protected Work Area:	A271+00	A283+00	**Protected Work Area:**	A271+00	A283+00

Hot Stick Info. Third Rail Gaps:

From	To	Track ID
A256+50	A308+31	1
A256+50	A305+31	2

Date & Time

Start: 04/09/2021 00:30 **End:** 04/09/2021 04:00

Contacts

Entered by **Requestor**

As of 04/12/2021 15:15
1 of 3

Appendix D – TRST - General Orders & Track Rights System (GOTRS) Request

GOTRS - GENERAL ORDERS & TRACK RIGHTS SYSTEM
Track Rights Request

Request Summary

Request Number:	202107400504	**Track Access:**	True
Dates Requested:	04/09/2021 00:00 to: 04/09/2021 04:30	**Clear In Ten:**	False
Request Status:	Closed	**Equipment on Track:**	1
Requestor:	[redacted]	**Allow Piggybacks:**	True
Requestor Organization:	DECO/IRPG	**In Piggyback:**	No
Switch Order:		**Power Outage:**	Supervisory
Lock Out / Tag Out:		**Additional AC:**	
Request Title:	Radio- A06 to A08 Install		

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:	Install Cable Supports and Cables
Work Type:	Radio
Meeting Location:	
PB Meeting Location:	
Tools and Equipment:	PPE, Hand Tools
Equipment on Track:	PM

Track 1

Actual Work Area:	A197+00	A263+00
Protected Work Area:	A192+00	A268+00

Hot Stick Info. Third Rail Gaps:

From	To	Track ID
A197+26	A205+10	1
A205+66	A230+90	1
A231+46	A255+57	1
A255+85	A256+22	1
A256+50	A308+31	1

Date & Time

As of 08/26/2021 05:42
1 of 4

GOTRS - GENERAL ORDERS & TRACK RIGHTS SYSTEM
Track Rights Request

Request Summary

Request Number:	202107400504	**Track Access:**	True
Dates Requested:	04/09/2021 00:00 to: 04/09/2021 04:30	**Clear In Ten:**	False
Request Status:	Closed	**Equipment on Track:**	1
Requestor:	[redacted]	**Allow Piggybacks:**	True
Requestor Organization:	DECO/IRPG	**In Piggyback:**	No
Switch Order:		**Power Outage:**	Supervisory
Lock Out / Tag Out:		**Additional AC:**	
Request Title:	Radio- A06 to A08 Install		

Start: 04/09/2021 00:00 **End:** 04/09/2021 04:30

Contacts

Entered by
[redacted]
Work:
Cell: [redacted] (Dayshift) **Home:** [redacted]

Requestor
[redacted]
Work:
Cell: [redacted] (Nightshift) **Home:**

WMATA Manager
[redacted]
Work:
Cell: [redacted] **Home:** [redacted]

Emergency Contact
[redacted]
Work:
Cell: [redacted] (Nightshift) **Home:** [redacted]

Support

SUPPORT GROUP	Crew Size
TRST/STRUC	5

Request Change History

Date	Event
03/15/2021 07:51	Request was replicated from Request 202107400500.
03/17/2021 07:26	Request was edited. Field(s) changed: Location. Location: Track 1 Actual: A203+60 A305+00 Protected: A198+60 A310+00, Track 2 Actual: A203+60 A305+00 Protected: A198+60 A310+00 to Track 1 Actual: A203+60 A305+00 Protected: A198+60 A310+00.
03/17/2021 07:27	Request was edited. Field(s) changed: Location. Location: Track 1 Actual: A203+60 A305+00 Protected: A198+60 A310+00 to Track 1 Actual: A197+00 A263+00 Protected: A192+00 A268+00.
03/22/2021 16:47	Request status was changed to Approved
04/09/2021 01:15	Work Prep was completed.

GOTRS - GENERAL ORDERS & TRACK RIGHTS SYSTEM

Track Rights Request

Request Summary

Request Number:	202107400504	**Track Access:**	True
Dates Requested:	04/09/2021 00:00 to: 04/09/2021 04:30	**Clear In Ten:**	False
Request Status:	Closed	**Equipment on Track:**	1
Requestor:	[redacted]	**Allow Piggybacks:**	True
Requestor Organization:	DECO/IRPG	**In Piggyback:**	No
Switch Order:		**Power Outage:**	Supervisory
Lock Out / Tag Out:		**Additional AC:**	
Request Title:	Radio- A06 to A08 Install		

Request Change History

Date	Event
04/09/2021 03:42	Request status was changed to Opened
04/09/2021 08:26	OCC Controller Comment was updated.
04/09/2021 08:35	Request status was changed to Closed

Request Group

Request Number	Description

Piggyback

No active piggybacks found

Red Tag information

Red Tag #: Request is not Red Tag.

Close-Out Summary

Final Status:	Closed
Request To Begin Work:	04/08/2021 23:42
Request to De-Energize:	04/09/2021 01:52
De-Energization Completed; RWIC notified:	04/09/2021 01:52
Hot Stick:	04/09/2021 04:04

From	To	Track ID	Waive(?)	Unit #	Chain Marker	Entered By	Date
A197+26	A205+10	1		6122	A197+26	[redacted]	04/09/2021 01:53
A205+66	A230+90	1		6122	A205+67		04/09/2021 02:15
A231+46	A255+57	1		6122	A241+46		04/09/2021 02:15
A255+85	A256+22	1		6122	A255+85		04/09/2021 02:15
A256+50	A308+31	1	Waived	Reason: Other Comment: Work location cleared.			04/09/2021 04:03

As of 08/26/2021 06:42
3 of 4

GOTRS - GENERAL ORDERS & TRACK RIGHTS SYSTEM

Track Rights Request

Request Summary

Request Number:	202107400504	**Track Access:**	True
Dates Requested:	04/09/2021 00:00 to: 04/09/2021 04:30	**Clear In Ten:**	False
Request Status:	Closed	**Equipment on Track:**	1
Requestor:	[redacted]	**Allow Piggybacks:**	True
Requestor Organization:	DECO/IRPG	**In Piggyback:**	No
Switch Order:		**Power Outage:**	Supervisory
Lock Out / Tag Out:		**Additional AC:**	
Request Title:	Radio- A06 to A08 Install		

Close-Out Summary

Permission Given To Setup Work Site:	04/09/2021 04:04
Start Work:	04/09/2021 04:04
Work Site Cleared by Requestor:	04/09/2021 04:05
Work Stopped by Requestor:	04/09/2021 04:05
Reason:	Not enough manpower
OCC Comments:	RWIC 6122 was removed for service due to an RWP Violation. At approximately 0215 PM 54 moved outside their working limits.
OCC Assistant Superintendent Comments:	
Requestor Comments:	

OCC Delays

Delay #	From	To	Reason	Re-Hot Stick Done
1	04/09/2021 02:39	04/09/2021 04:01	Pending investigation.	

As of 08/26/2021 06:42
4 of 4

Appendix E – Roadway Job Safety Briefing (RJSB)

WMATA ROADWAY JOB SAFETY BRIEFING FORM

DATE: 4-8-2021 TRACK TIME ON/OFF: ____/____

RWIC NAME: [redacted] CALL#: 6122 EMPLOYEE #: [redacted]

RWIC's CELL PHONE NUMBER: ____ RADIO OPS CHANNEL: 1

SAFETY RULE OF THE DAY: SOP 1.22 1A 3A A06 1956 60

WORK ASSIGNMENT: work prep for fiber optic install DIRECTION OF TRAFFIC: INBOUND [X] OUTBOUND [ ]

RAIL LINE (A) B C D E F G J K L N TRACK 1 X 2 ___ 3 ___ WORK LIMITS CHAIN MARKER(s): ____

PLACE OF SAFETY: Platform

TYPE OF PROTECTION(s): IT ____ ETO AUTHORITY X ETO LOCAL SIGNAL ____ AMF ____ FT ____

REQUEST FROM ROCC: BLOCK CALLS [X] CANCEL AUTOMATIC SIGNALS [X] PROHIBIT EXITS [X]

RED HOT SPOT(s) TYPE/LOCATION(s): [X] RED HOT SPOT HAZARDS [X] ETS/RADIO OUTAGE [ ]

FOUL TIME PROTECTION CAN BE REQUESTED IN ALL WORK ZONE CONFIGURATIONS

POWER OUTAGE: LOCK OUT TAG OUT ____ RED TAG ____ SUPERVISORY X NO POWER OUTAGE ____

RED TAG NUMBER: ____ RED TAG HOLDER: ____

WATCHMAN/LOOKOUT ASSIGNED: Yes ___ No X 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 X 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): N/A PIGGY BACK WORKZONE CM(s): N/A

PIGGY BACK WORK ASSIGNMENT: N/A

NUMBER OF RMM(s): 1 RMM OPERATIONS IN WORK ZONE: PM54

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

WEATHER CONDITIONS	X	TRIPPING HAZARDS / UNEVEN WALKING SURFACES	X
TRACK GRADE AND VISIBILITY	X	POOR LIGHTING / TUNNEL AND VENT SHAFT(S)	X
HAZARDS ASSOCIATED WITH RAIL VEHICLE MOVEMENT	X	TRAIN / CURVE SPEED(s)	X
WORK SITE CONDITIONS AND ACTIVITIES	X	ETS BOX(s) LOCATIONS	X
EMERGENCY PROCEDURES	X	EQUIPMENT AND TOOL SAFETY	✓
ADJACENT TRACK PROTECTION	X	ROTATION AND RELIEF PROCEDURES	[ ]

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

WMATA ROADWAY JOB SAFETY BRIEFING FORM

ROADWAY WORKERS HAVE THE RIGHT AND RESPONSIBILITY TO INITIATE A GOOD FAITH CHALLENGE WHEN NECESSARY

Inspect PPE [✓] Inspect RWP Sticker [✓] Inspect Radio(s) Certification Due Date [✓] Perform Radio Check(s) [✓]

ROADWAY WORKER ACKNOWLEDGEMENT

I understand and agree with all aspects of the Roadway Job Safety Briefing I just received. I feel I am adequately protected from any train movement or roadway hazards. I understand I have a responsibility to conduct myself in a safe manner at all times.

Roadway Worker Signature	Employee/Contractor ID #	Crew Leader(s) Signature/ID#		Radio Call #
[redacted]				6118
				7401

RWIC COMMENTS: All PPE at all times (including mask) Report all incidents (no matter how minor)
Hospital: BridgePoint 2nd RWIC: Partlow 23:42

RWIC SIGNATURE: [redacted] DATE/TIME: 4-8-2021

RELIEVING RWIC: _____ DATE/TIME: _____

GOOD FAITH CHALLENGE INFORMATION

EMPLOYEE(s) NAME:_____ EMPLOYEE(s)#_____ DATE/TIME_____

RWP ISSUE(s)_____ ISSUED RESOLVED: Yes___ No___

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

Washington Metro Area Transit Authority
Department of Safety and Environmental Management (SAFE)

FINAL REPORT OF INVESTIGATION A&I E21138

Date of Event:	4/9/2021
Type of Event:	Improper Roadway Worker Protection
Incident Time:	01:46 hours.
Location:	Outside of Tenleytown Station, between Chain Marker A1-271+00 to A1-283+00
Time and How received by SAFE:	06:50 hours Based on discovery from the initial event investigation (E21137, notification made at 04:48).
WMSC Notification Time:	07:09 hours
Responding Safety Officers:	WMATA: Yes WMSC: No Other: No
Rail Vehicle:	Prime Mover (PM) 54
Injuries:	No
Damage:	No
SMS I/A Incident Number:	20210409#92713

Table of Contents

Abbreviations and Acronyms

AIMS	Advanced Information Management System
ARS	Audio Recording System
CCTV	Closed-Circuit Television
CM	Chain Marker
COMM	Office of Systems Maintenance Communication Section
EDT	Eastern Daylight Time
ETO	Exclusive Track Occupancy
FT	Foul Time
GOTRS	General Orders and Track Rights System
MSRPH	Metrorail Safety Rules and Procedures Handbook
NOAA	National Oceanic and Atmospheric Administration
PLNT	Office of Plant Maintenance
PM	Prime Mover
ROCC	Rail Operations Control Center
ROQT	Rail Operations Quality Training
RTC	Rail Traffic Controller
RWIC	Roadway Worker in Charge
RWP	Roadway Worker Protection
SAFE	Department of Safety and Environmental Management
SAFTE- FAST	Sleep, Activity, Fatigue and Task Effectiveness - Fatigue Avoidance Scheduling Tool
SMS I/A	Safety Measurement System Incidents/Accidents
SOP	Standard Operating Procedure
SRC	Safety Risk Coordinator
TRST	Office of Track and Structures
WMATA	Washington Metropolitan Area Transit Authority
WSAD	Warning Strobe and Alarm Device
WMSC	Washington Metrorail Safety Commission

Executive Summary

On April 9, 2021, at 02:24 hours, Eastern Daylight Time (EDT), the Rail Operations Control Center (ROCC) was notified by the Office of Plant Maintenance (PLNT) Roadway Worker in Charge (RWIC) of an Improper Roadway Worker Protection (RWP) event outside Tenleytown Station, between Chain Marker (CM) A1-271+00 to A1-283+00. Based on the Audio Radio System (ARS) playback, the PLNT-RWIC reported that at approximately 02:15 hours, a rail vehicle operated through their work zone, and the Equipment Operator did not request authorization to ensure confirmation of a clear track. There were no injuries or damage reported as a result of this incident.

Upon further investigation, two work crews were working in close proximity to one another. The PLNT-RWIC representing PLNT had a Supervisory Power Outage scheduled in General Orders and Track Rights System (GOTRS) on the A-Line between CMs A1-271+00 to A1-283+00, Track 1 and Track 2 under Exclusive Track Occupancy (ETO) RWP. The purpose of the GOTRS request was to perform emergency egress stairs repair efforts in FA-10 Vent and Emergency Egress Shaft. See Appendix C. The second work crew from the Office of Track and Structures (TRST) had a work zone between CMs A1-192+00 to A1-268+00.

The Advanced Information Management System (AIMS) playback revealed that at approximately 01:36 hours, third rail power was de-energized, and the ROCC Buttons Rail Traffic Controller (RTC) had activated blue block and human form status at CM A1-204+60 to A1-308+31 and CM A2-192+00 to A2-308+31.

Based on the AIMS playback, at approximately 02:10 hours, the Prime Mover (PM) 54 operated through the PLNT-RWIC's work zone. The Closed-Circuit Television (CCTV) footage confirmed the Equipment Operator operating PM54 went through the PLNT-RWIC's work zone. See Figure 6.

The ARS playback revealed that the PLNT-RWIC notified the ROCC Radio RTC and reported they hot-sticked and confirmed that third rail power was de-energized at CM A1-278+00 and CM A2-278+00. The ROCC Radio RTC instructed the PLNT-RWIC to notify the ROCC when shunts were adequately installed to verify track occupancy. At approximately 01:46 hours, the PLNT-RWIC expressed to the ROCC that third rail power is de-energized on both tracks for safety only, there will be no equipment or personnel on the trackbed, and the work crew will be working in the FA-10 Vent and Emergency Egress Shaft.

The ARS playback revealed that TRST personnel was in the process of hot-sticking third rail gaps when PM54 traveled beyond their CM’s parameters, entering into the PLNT-RWIC’s work zone. No personnel or equipment were working on the trackbed; all PLNT personnel were working in FA-10 Vent and Emergency Egress Shaft. The ROCC instructed the PLNT work crew to clear the roadway and suspended all work activities due to pending investigation.

During SAFE virtual interviews, the PLNT-RWIC stated that they were familiar with requirements WMATA, Section 5 – RWP Manual, 5.4.1 "What is the Roadway," but did not set up ETO RWP based on not needing access to the trackbed and that they never expected for a rail vehicle to come through their work zone. Additionally, the PLNT-RWIC indicated the training received from PLNT management and the training department was not sufficient enough for them to do their

job. The ROCC Radio RTC that allowed the PLNT-RWIC not to set up equipment for ETO RWP has approximately two months of experience in that role. RWICs are not allowed under any circumstance to downgrade or deviate from the established RWP procedures; however, this happens frequently. There is no official process for downgrading RWP, and work crews shall only set up their work area as detailed in GOTRS. The PLNT-RWIC and their work crew were not engaged in the trackbed's work activities, so the ROCC Radio RTC thought it was allowable for the PLNT-RWIC not to set up their safety equipment. The ROCC Radio RTC stated they did not know the FA-10 Vent and Emergency Egress Shaft did not have handrails or protective railings and is considered part of the roadway. The ROCC Radio RTC indicated it is common for PLNT-RWICs to downgrade from Supervisory Power Outages and not set up equipment and state that power will be down for safety only; nothing stood out to them about the request. The ROCC Radio RTC stated they were unaware of the ROCC's Lessons Learned for Improper Use of Foul Time (FT) Protection developed on September 18, 2020, with corrective actions enforcing the RTCs to follow the scheduled GOTRS rights protection indicated and not allow personnel to downgrade.

The probable cause of the Improper RWP event on April 9, 2021, was improper decision-making to request and permit deviations from critical RWP safety procedures. As a result, this led the PLNT-RWIC and ROCC Radio RTC to allow work to be conducted without required safety equipment in place.

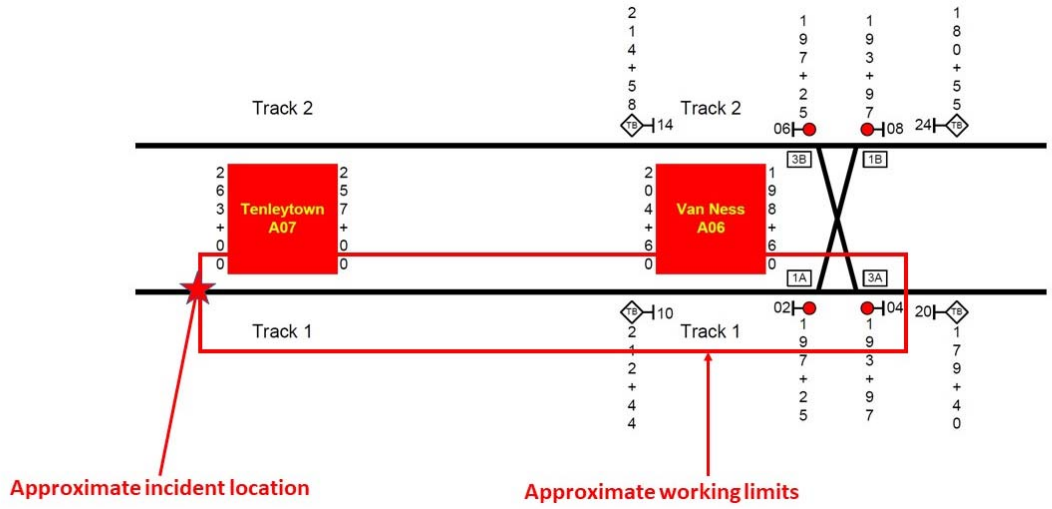
Incident Site

Outside of Tenleytown Station, between CM A1-271+00 to A1-283+00

PLNT – GOTRS

Actual – Chain Marker A1-276+00 to A1-278+00 and A2-276+00 to A2-278+00
Protected – Chain Marker A1-271+00 to A1-283+00 and A2-271+00 to A2-283+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 scheduled two interviews as part of this investigation. The interviews included:
    - PLNT-RWIC
    - 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
    - Certification
    - The 30-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]
    - Closed-Circuit Television (CCTV) playback
    - Advanced Information Management System (AIMS)
    - General Orders and Track Rights System (GOTRS)

Investigation

On Friday, April 9, 2021, at 02:24 hours, the PLNT-RWIC notified the ROCC and reported an Improper RWP event between CM A1-271+00 to A1-283+00 at approximately 02:15 hours. The PLNT-RWIC indicated that a rail vehicle went through their working zone without permission. There were no injuries or damage reported as a result of this incident.

The ARS playback revealed, at 00:26 hours, the PLNT-RWIC contacted the ROCC Radio RTC and requested to activate their GOTRS rights for a Supervisory Power Outage, A-Line on Track 1 and Track 2, CM 271+00 to CM 283+00 under ETO - RWP. The ROCC Radio RTC acknowledged the request and requested the PLNT-RWIC to standby. At 01:36 hours, the ROCC Radio RTC contacted the PLNT-RWIC and stated that the A08-02 signal was red, and the A06-08 signal was red, prohibit exits, block calls, cancellation of automatic signals, and blue block and human form status were in place. At this time, breakers were commanded open and the PLNT –

RWIC had permission to enter the roadway to hot-stick and confirm that third rail power was de-energized and provide the ROCC a CM and relinquish the FT.

Advanced Information Management System (AIMS)

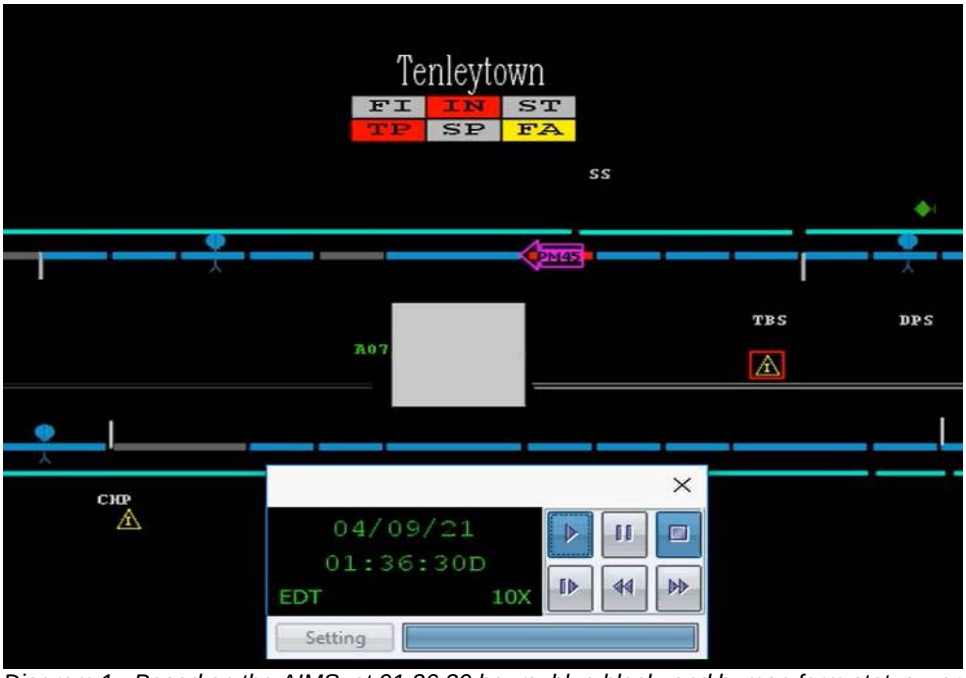


Diagram 1 - Based on the AIMS, at 01:36:30 hours, blue block, and human form status were in place before the PLNT-RWIC entered the roadway to hot stick and confirm that third rail power was de-energized between Tenleytown Station, Track 1 and Track 2.

Based on ARS playback, at 01:46 hours, the PLNT-RWIC notified the ROCC Radio RTC and reported they hot sticked and confirmed that third rail power was de-energized at CM A1-278+00 and CM A2-278+00. The ROCC Radio RTC acknowledged and instructed the PLNT-RWIC to notify the ROCC when shunts were adequately installed to verify track occupancy. The PLNT-RWIC expressed to the ROCC that third rail power was de-energized for both tracks for safety only, there will be no equipment or personnel on the trackbed, and the work crew will only be working in the FA-10 Vent and Emergency Egress Shaft. The ROCC Radio RTC granted the PLNT-RWIC permission to enter the roadway to start work, and ETO RWP wasn't established. The ROCC Radio RTC also stated if you need to enter the roadway to notify the ROCC.

Based on the review of WMATA, Section 5 – RWP Manual, 5.4.1 "What is the Roadway," bullet point two states, "… In tunnel areas, it is all areas between tunnel walls to include all safety walk areas and open shafts and ancillary areas. Vent shafts and emergency egress shafts, with handrails or protective railings, are NOT considered part of the roadway." The Tenleytown Station, FA-10 Vent and Emergency Egress Shaft is part of the roadway because it did not have handrails or protective railings.

Although the work was performed away from the physical tracks, the work area is considered part of the right-of-way. The PLNT-RWIC downgraded their protection by not setting up required safety equipment, thus not following their stated on-track protection of ETO-Authority. This is not in compliance with the 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 WSADS. **NOTE:** RWICs are not allowed under any circumstance

to downgrade or deviate from the established RWP procedures. There is no official process for downgrading RWP, and work crews shall only setup their work area as detailed in GOTRS.

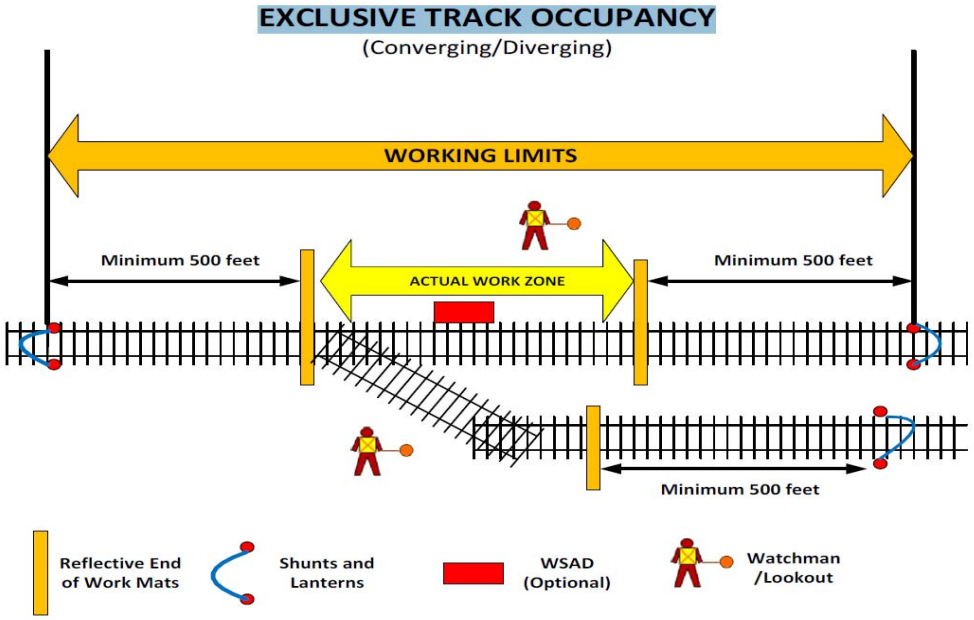


Diagram 2 – Correct ETO protection diagram.

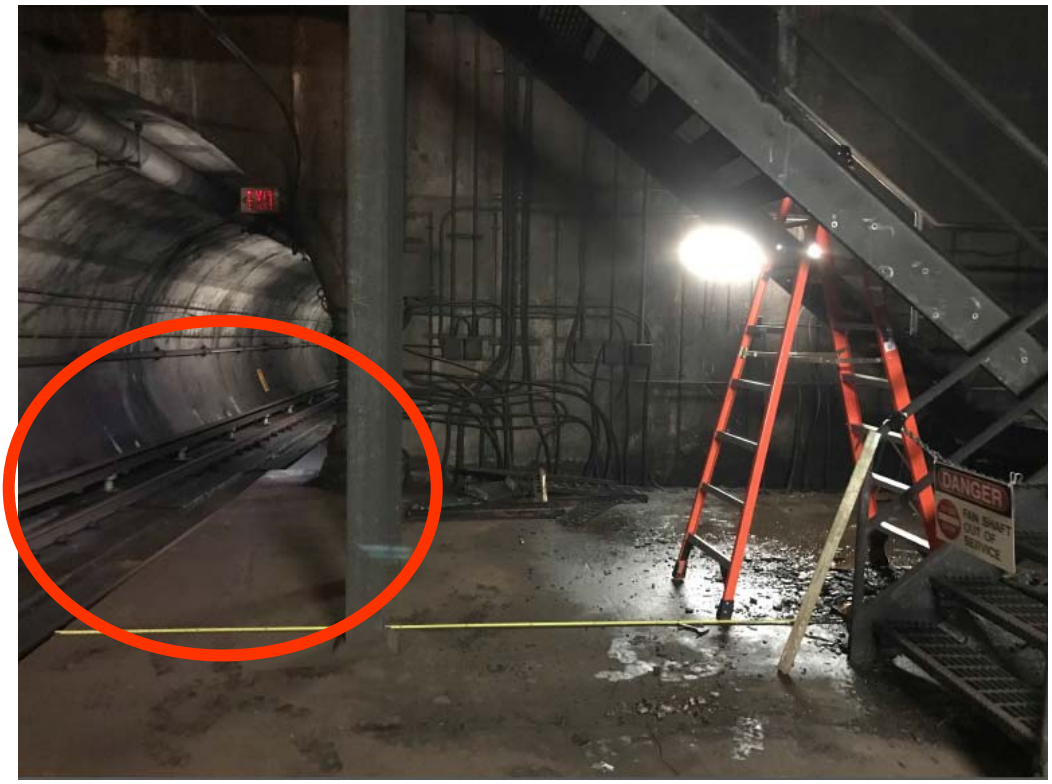


Figure 1 - The Tenleytown Station, Track 1, FA-10 Vent and Emergency Egress Shaft work location without handrails or protective railings on the edge of the platform, which means it is considered part of the roadway.

Figure 2 - The Tenleytown Station, Tracks 1 and 2, FA-10 Vent and Emergency Egress Shaft location without handrails or protective railings on the edge of the platform, which means it is considered part of the roadway.

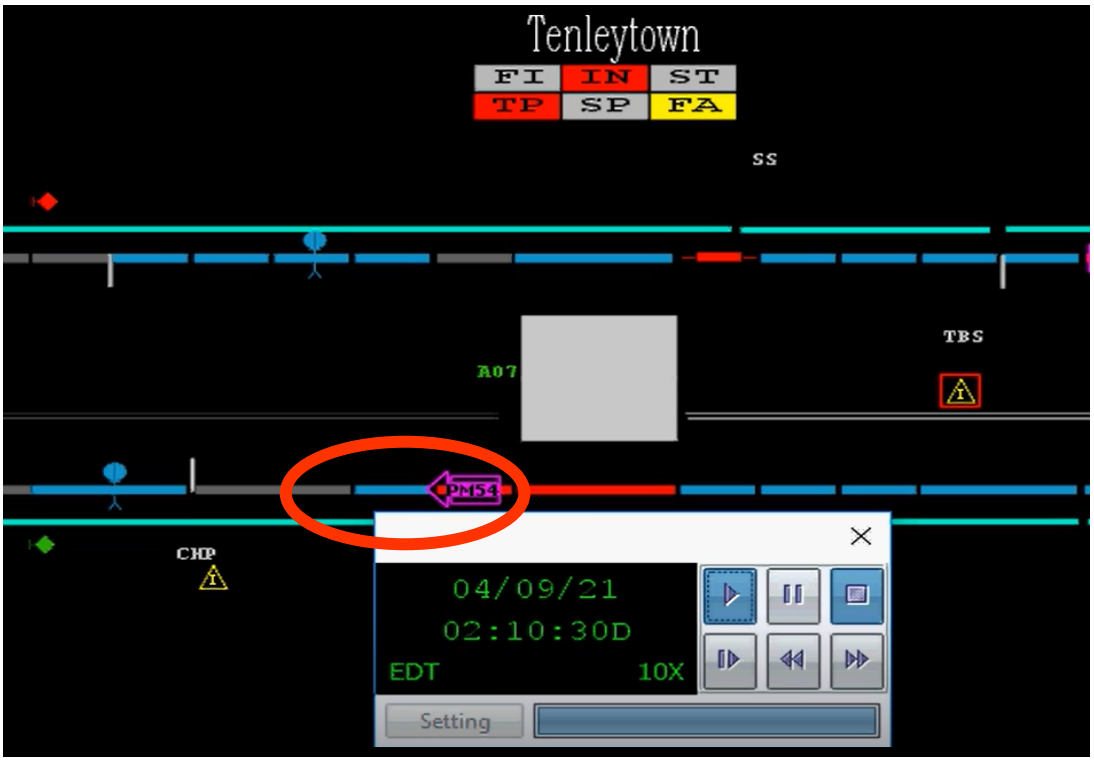


Diagram 3 - Based on the AIMS, at 02:10:30 hours, prohibit exits, block calls, cancellation of automatic signals, blue block, and human form status were in place when the rail vehicle operated through the PLNT-RWIC's work zone without permission.

Based on ARS playback, at approximately 02:15 hours, the PLNT-RWIC notified the ROCC Radio RTC and indicated that they are about to landline the ROCC. At 02:24 hours, the PLNT-RWIC reported an Improper RWP event at Tenleytown Station, Track 1, at approximately 02:15 hours. The PLNT-RWIC indicated that a rail vehicle went through their work zone. The PLNT-RWIC reported no personnel were working on the roadway; the work crew was only working in the FA-10 Vent and Emergency Egress Shaft, and the tracks were down for safety purposes only. There is no official term or process for de-energizing third rail power for safety purposes only. The work crews shall only setup their work area as detailed in GOTRS. The ROCC instructed the work crew to clear the roadway and suspended all work activities due to pending investigation.

At approximately 03:30 hours, the PLNT-RWIC contacted the Radio RTC and reported all personnel and equipment had cleared the roadway at Tenleytown Station, Tracks 1 and 2. The PLNT-RWIC indicated the ROCC was free to restore third rail power at their discretion. There were no injuries reported.

Closed-Circuit Television (CCTV)

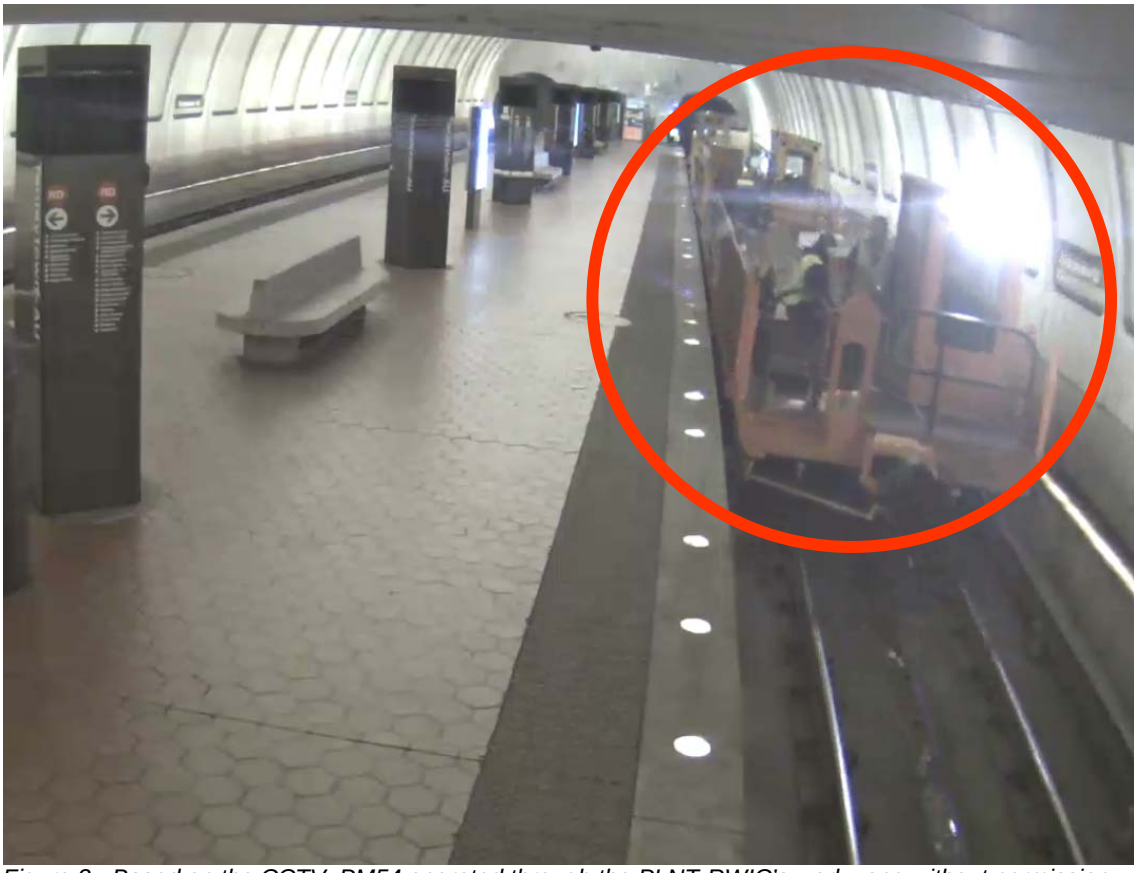


Figure 3 - Based on the CCTV, PM54 operated through the PLNT-RWIC's work zone without permission.

Audio Recording System (ARS) Chronological Event Timeline

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

Time	Description
00:26:40 hrs.	PLNT RWIC: Notified ROCC Radio RTC and stated they were requesting Supervisory Power Outage, A-Line on Track 1 and Track 2, CM 271+00 to CM 283+00. ROCC Radio RTC: Acknowledged and asked the PLNT-RWIC what type of protection are you using. PLNT RWIC: Responded, ETO protection. ROCC Radio RTC: Acknowledged and instructed the PLNT-RWIC to standby and stand clear. [Ops 1]
01:36:55 hrs.	ROCC Radio RTC: Notified the PLNT-RWIC and stated Signal A08-02 was red and Signal A06-08 was red; all prohibit exits blue block human form were in place at this time. You have permission under FT protection to enter the roadway to hot-stick and confirm a de-energized track and contact the ROCC with a CM and relinquish your FT. PLNT RWIC: Acknowledged. [Ops 1]
01:46:40 hrs.	PLNT RWIC: Notified ROCC Radio RTC and stated third rail power had been confirmed de-energized A-Line on Track 1 and Track 2, CM 278+00. ROCC Radio RTC: Acknowledged and indicated at this time you have permission to install your shunt straps and verify track occupancy with the ROCC when shunts are installed. PLNT RWIC: Responded, both tracks are down for safety only, and there will be no equipment or personnel on the track. ROCC Radio RTC: Acknowledged and stated you have permission to start work, and if you need to enter the roadway, contact the ROCC. PLNT RWIC: Acknowledged. [Ops 1]
02:15:30 hrs.	PLNT RWIC: Notified ROCC Radio RTC and indicated they are about to landline the ROCC. [Ops 1]
02:16:30 hrs.	ROCC Radio RTC Two: Notified TRST unit and asked, did you operate PM54 outside your working limits. TRST: Responded; I asked the ROCC to relinquish FT protection and utilize PM54 to check the remainder of the gaps. ROCC Radio RTC: Responded, that's a negative you need to remain within your working limits, over. TRST: Responded; confirm I will give you a landline. [Ops 1]
02:24:49 hrs.	PLNT RWIC: Notified ROCC Radio RTC and reported no personnel was working on the roadway, all personnel were working in the FA-10 Vent and Emergency Egress Shaft, and the tracks were down for safety purposes only, and there is no safety equipment setup on the roadway. However, a PM unit just came through our work area. The PLNT-RWIC reported no injuries as a result of this incident. [Phone]
02:42:12 hrs.	ROCC Radio RTC: Notified PLNT-RWIC and stated, stand by and stand clear you are being placed on a delay due to pending investigation. PLNT RWIC: Responded; all personnel were standing clear. [Ops 1]

Time	Description
03:05:36 hrs.	ROCC Assistant Superintendent: Notified SAFE and reported the Improper RWP event at CM A1 268+00. [Phone]
03:20:59 hrs.	ROCC Assistant Superintendent: Notified PLNT Superintendent and reported the Improper RWP event at CM A1 268+00. [Phone]
03:30:01 hrs.	PLNT RWIC: Notified ROCC Radio RTC and stated all personnel and equipment clear of the roadway and you may restore third rail power at your discretion. ROCC Radio RTC: Acknowledged. [Ops 1]
03:30:25 hrs.	SAFE Management: Notified the ROCC Assistant Superintendent and asked if the PLNT crew working in the fan shaft have GOTRS rights ROCC Assistant Superintendent: Responded, yes, the PLNT crew had GOTRS rights and was just working in the vent shaft. SAFE Management: Responded, PLNT have GOTRS rights because the fan shafts are considered roadway unless protected by a continuous handrail. ROCC Assistant Superintendent: Responded, I would have to figure it out to see if that area was protected by a continuous handrail. SAFE Management: Responded, the point is they had GOTRS rights and they did not downgrade or anything right, I know y'all don't do that anymore. ROCC Assistant Superintendent: Responded, the PLNT-RWIC stated that they will only be working in the vent shaft and tracks will be down only for safety. ROCC Assistant Superintendent: Responded, I would have to figure it out to see if a continuous handrail protected that area. [Phone]

Office of Systems Maintenance Communication Section (COMM)

COMM performed a comprehensive radio operational test at Tenleytown Station to Friendship Heights Station, Tracks 1 and 2. COMM discovered intermittent transmission issues and no audio midway in the tunnel. COMM generated a Maximo Work Order and performed troubleshooting efforts, and subsequently resolved the radio issues.

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:

PLNT RWIC

During the virtual interviews, the PLNT-RWIC stated that their scope of work was to repair the Tenleytown Station, FA-10 Vent and Emergency Egress Shaft stairs. The PLNT-RWIC notified the ROCC and reported that PM54 operated through their work zone without permission at approximately 02:15 hours. Before the Improper RWP event, the PLNT-RWIC said to the ROCC that they hot-sticked and confirmed third rail power had been de-energized. The PLNT-RWIC received permission from the ROCC to enter the roadway, setup equipment, and start work. The PLNT-RWIC expressed to the ROCC both tracks were down for safety only, and there will be no equipment or personnel on the trackbed, and the work crew will only be working in the FA-10 Vent and Emergency Egress Shaft. The PLNT-RWIC never indicated to the ROCC that the vent shaft

and emergency egress area they were working in did not have handrails or protective railings. The PLNT-RWIC noted that they were familiar with requirements WMATA, Section 5 – RWP Manual, 5.4.1 "What is the Roadway," but made the decision to deviate from procedures and not setup ETO, RWP based on not needing access to the trackbed and the PLNT-RWIC indicated they never expected for a rail vehicle to come through their work zone. The PLNT-RWIC expressed they feel the training received from PLNT management and the training department was not sufficient for them to do their job.

Radio RTC

The ROCC Radio RTC stated they just graduated from training and only have two months of experience as an RTC. The Radio RTC indicated they granted the PLNT-RWIC permission to start work and instructed the PLNT-RWIC to notify the ROCC if personnel need to enter the roadway. Since the PLNT-RWIC and their work crew were not engaged in the trackbed's work activities, they thought it was acceptable for the PLNT-RWIC not to setup their safety equipment. The Radio RTC stated they did not know the vent shafts and emergency egress shafts did not have handrails or protective railings and were considered part of the roadway. It's common for RWICs to downgrade from Supervisory Power Outages and not setup equipment and state that power will be down for safety only, so nothing stood out to them about the request. The Radio RTC was unaware of a playbook for the ROCC to utilize as a checklist to ensure quality. During the RTC training process, the instructor infrequently went over previous Lessons Learned incidents to use as guidance for when they graduated. During the interview, SAFE went over ROCC's Lessons Learned for Improper Use of FT Protection developed on September 18, 2020, discussing the work crew who downgraded from supervisory power to non-power outages. The ROCC's corrective actions for this incident were to enforce whatever the scheduled GOTRS rights protection indicated and not allow personnel to downgrade. The ROCC Radio RTC stated they were unaware of the ROCC's Lessons Learned and corrective actions developed on September 18, 2020. Additionally, SAFE went over ETO requirements per MSRPH 5.13.5 and What is the Roadway per MSRPH 5.4.1 with the ROCC Radio RTC and the RWIC.

Weather

At the time of the incident, National Oceanic and Atmospheric Administration (NOAA) recorded the temperature as 57°F and overcast and 87% humidity. Based on findings, SAFE has concluded that weather was not a contributing factor in this incident (Weather source: NOAA – Location: Washington, DC.)

Human Factors

Post Incident Toxicology Testing

At the time of this incident, ROCC, and PLNT involved personnel were not removed from service for post-incident toxicology testing. Based on SAFE's investigative findings and Metro's drug and alcohol policy, involved personnel should have been removed from service for post-incident testing given the known facts at the time of the incident. Under WMATA's current Drug and Alcohol Policy and Testing Program Policy Instruction 7.7.3/6, Post-Incident Testing may be performed on employees and contractors whose performance cannot be "completely discounted" as a contributor to an event.

Fatigue

ROCC Radio RTC

Evidence of Fatigue:

The incident data was evaluated for evidence of fatigue that may have been present at the time of the incident. No sign of fatigue was indicated by the available data. The employee 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 incident data was evaluated for fatigue risk factors. Risk factors for fatigue were present. The incident occurred at a time of low circadian alertness. The employee reported keeping a regular sleep schedule in the days leading up to the incident, including maintaining the daytime sleep schedule during regular days off that preceded the incident shift. The employee worked nights in the week leading up to the incident.

The incident occurred on the first night shift after four nights off. The employee was awake for 12.2 hours at the time of the incident. The employee reported 8 hours of sleep in the 24 hours preceding the incident. This was comparable to the employee's usual workday sleep durations. The preceding off-duty period was over four days in duration, which provided an opportunity for adequate sleep before the shift. The employee reported no issues with sleep.

Since a fatigue risk factor was present, a biomathematical fatigue modeling application Sleep, Activity, Fatigue and Task Effectiveness - Fatigue Avoidance Scheduling Tool (SAFTE-FAST) was used to further evaluate fatigue risk factors that may have been present in the employee's schedule. The analysis was based on the employee's work schedule, bed and wake times from the day before the incident and reported habitual sleep durations. Despite the time of day, the estimated performance effectiveness at the time of the incident was 99%. This may be due to the effect of the controller's sleep schedule in the week leading up to the event. Maintaining a daytime sleep schedule can help shift the circadian clock into a better alignment with the night work schedule.

Diagram 4 - Modeling analysis output shows estimated performance effectiveness for the period leading up to the incident, based on the employee work and reported sleep schedule. Estimates were based on the employee's work schedule, bed and wake times from the day before the incident and reported habitual sleep durations (10.25 hours a day, split in two periods). Bold portions of the modeled curve show work (in black) and sleep times (in blue). Effectiveness is shown on the vertical axis, with colored fields in the chart background signifying ranges of effectiveness scores including high effectiveness (>90%) in green, and low effectiveness (<65%) in red. Time is shown on the horizontal axis. Markers for work and sleep times are shown in the lanes above the time of day on the horizontal axis.

PLNT-RWIC

Evidence of Fatigue:

The incident data was evaluated for evidence of fatigue that may have been present at the time of the incident. No sign of fatigue was indicated by the available data. The employee 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 incident data was evaluated for fatigue risk factors. Risk factors for fatigue were present. The incident occurred at a time of low circadian alertness. The employee also reported some variation in the sleep schedule in the days leading up to the incident. In the days leading up to the incident, the employee worked overtime that extended the regular daytime assignment to begin the previous night. The employee was awake for over 16 hours at the time of the incident, which can increase the likelihood of impairment due to fatigue. The employee reported 8 hours of sleep in the 24 hours preceding the incident. The off-duty period was 15.5 hours which provides an opportunity for adequate sleep. This was comparable to the employee's reported usual workday sleep durations. The employee reported no issues with sleep.

Since a fatigue risk factor was present, a biomathematical fatigue modeling application (SAFTE-FAST) was used to further evaluate fatigue risk factors that may have been present in the employee's schedule. The analysis was based on the employee's work schedule, bed and wake times from the days before the incident and reported habitual sleep durations. The estimated performance effectiveness at the time of the incident was 81%. The analysis confirmed time of day (i.e., performance impacted by the time of circadian low) and recent sleep duration as contributing to an increased risk of impaired performance at the time of the incident.

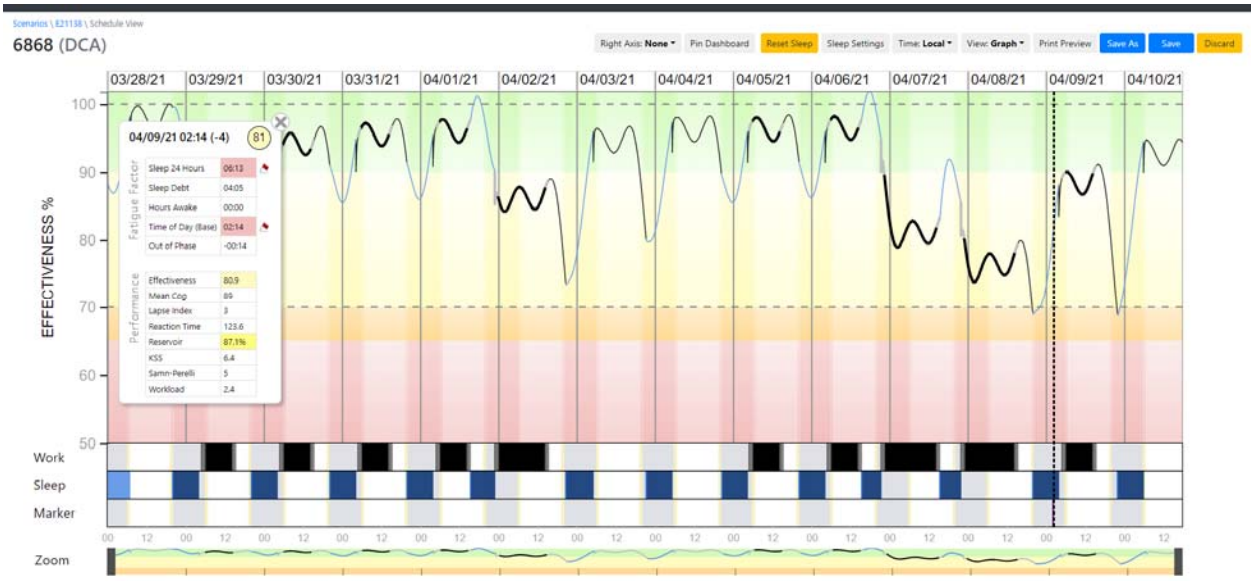


Diagram 5 - Modeling analysis output shows estimated performance effectiveness for the period leading up to the incident, based on the employee work and reported sleep schedule. Estimates were based on the employee's work schedule, bed and wake times from the day before the incident and reported habitual sleep durations (8 hours a day, split in two periods). Bold portions of the modeled curve show work (in black) and sleep times (in blue). Effectiveness is shown on the vertical axis, with colored fields in the chart background signifying ranges of effectiveness scores including high effectiveness (>90%) in green, and low effectiveness (<65%) in red. Time is shown on the horizontal axis. Markers for work and sleep times are shown in the lanes above the time of day on the horizontal axis.

Findings

- During the virtual interview, the ROCC Radio RTC indicated they did not recall reviewing or signing ROCC's Lessons Learned for Improper Use of FT Protection approved and issued on September 18, 2020. The ROCC's corrective actions for this Lessons Learned were to enforce whatever the scheduled GOTRS rights protection indicated and not allow personnel to downgrade. See Appendix E. **NOTE:** It could not be confirmed if the ROCC Radio RTC reviewed the ROCC's approved and issued Lessons Learned. Based on a discussion with the Director of Rail Operations Quality Training (ROQT), there was no records or sign-off process for reviewing Lessons Learned reviewed in the Train Operators' course at the time of its issuance. With the implementation of the MetroDocs system, sign-off verification is conducted electronically and captured.
- TRST RWIC used PM 54 to travel beyond their work zone and unknowingly entered the adjacent work zone without contacting the PLNT-RWIC (refer to E21137 - 20210409 - Draft Final Report - Tenleytown-AU Station - Improper RWP).
- Under Metrorail rules, RWICs and ROCC RTCs are not allowed under any circumstance to downgrade or deviate from the established RWP procedures. There is no established process for downgrading RWP, and work crews shall only setup their work area as detailed in GOTRS.
- No video recording available on PM54. CCTV and AIMS playback were used to identify times and locations of the unit.
- No CCTV video was available at FA-10 Vent and Emergency Egress Shaft incident location.
- The PLNT-RWIC work zone was not set up according to the GOTRS rights and the RJSB.
- The ROCC Radio RTC and PLNT-RWIC did not use the appropriate level of protection to support the nature of the work. MSRPH 5.13, "This provides all appropriate personnel protection while working on the Roadway."

- The PLNT-RWIC checked the Supervisory Power Outage, ETO, RWP protection section on the RJSB form. However, the PLNT-RWIC did not set up the work zone correctly with shunts located at 500 feet outside each end of the working zone, red lanterns or e-flares, "END Work AREA" mats, and WSADS to provide the appropriate level of protection for the roadway workers. This is not in compliance with MSRPH 5.13.7, "ETO Protection."
- Based on ARS playback Ops 1, SAFE identified intermittent transmission issues between the ROCC Radio RTC and personnel on the roadway.
- COMM performed a comprehensive radio operational test and discovered intermittent transmission issues and no audio midway in the tunnel. COMM will complete troubleshooting efforts and subsequently implement a resolution.
- The ROCC Radio RTC certified February 22, 2021 and has approximately two months of experience as an RTC.
- The ROCC Radio RTC engaged in a refresher training on April 10, 2021, outlining several owl shifts operational logistics to include clear and specific communications with field personnel and setup work locations. See Appendix F.
- During the virtual interview, the PLNT-RWIC expressed that they felt the training received from PLNT management and the training department was not sufficient for them to do their job.
- PLNT developed and distributed a safety bulletin indicating when setting up ETO work zones where power is de-energized, all applicable safety devices shall be installed including; 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 WSADS. Additionally, PLNT noted RWICs are not allowed under any circumstance to downgrade or deviate from the established RWP procedures.
- As countermeasures to directly address practical drift for oversight of RWP/work zone setup, SAFE generated a Safety Bulletin to personnel to raise awareness of the core RWIC functions and ensure that RWIC's are not performing tasks outside the scope of the RWIC's responsibilities. See Appendix G. Also, there are now daily/nightly RWP Compliance checks being performed by SAFE. In addition, since late June 2021, PLNT instituted a weekly RWP work zone check from their supervisors.
- The TRST Equipment Operator stated they interpreted the instructions from the ROCC as permitting them to use PM54 to hot stick the third rail at CM A1-308+31, which was outside of their working limits. Additionally, the TRST Equipment Operator stated that the lack of complete and thorough communications contributed to the miscommunication between them and the ROCC.
- This event is related to a second Improper RWP Event, E21137.

Immediate Mitigation to Prevent Recurrence

- The ROCC instructed the work crew to clear the roadway and suspended all work activities due to an Improper RWP event.

Probable Cause Statement

The probable cause of the Improper RWP event on April 9, 2021, was improper decision-making to request and permit deviations from critical RWP safety procedures. As a result, this led the PLNT-RWIC and ROCC Radio RTC to allow work to be conducted without required safety equipment in place.

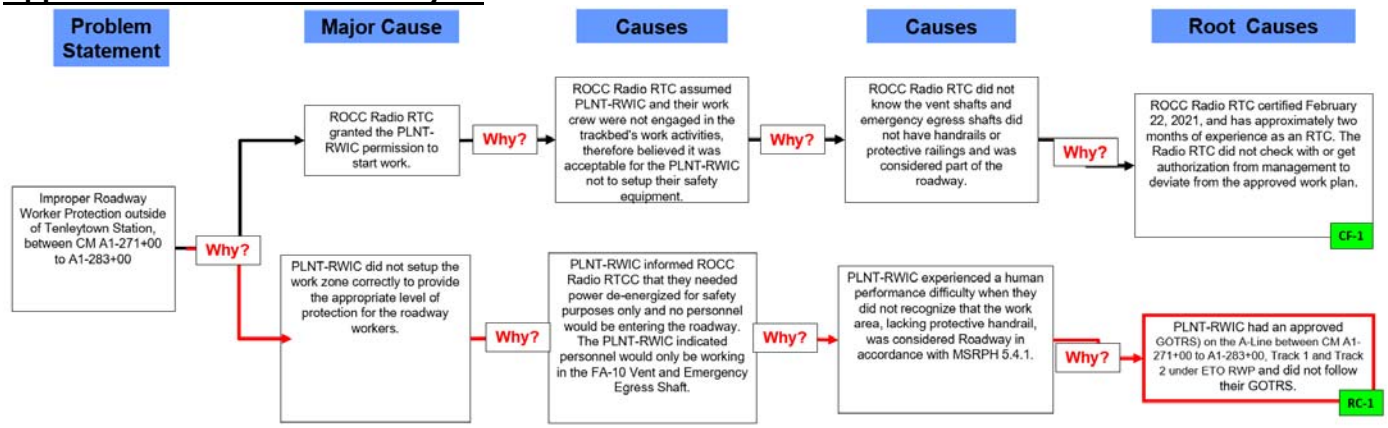
SAFE Recommendations/Corrective Actions

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
92713_SAFE CAPS_ROCC _001	(CF-1) Provide refresher training to all scheduled owl shift ROCC RTCs reinforcing the owl shift's operational logistics to include clear and specific communications with field personnel and setup work locations.	ROCC SRC	4/10/2021
92713_SAFE CAPS_PLNT _002	(RC-1) Developed a Safety Bulletin # PLNT 20210409-1: Improper Work Zone Setup. PLNT circulated this Safety Bulletin to all maintenance groups during Safety Stand-Downs at their next toolbox meeting. All RWP level 2 & 4 certified employees were required to attend the Safety Stand-Down. The purpose was to reinforce that the RWICs and their work crew set up their work area as detailed in GOTRS. RWICs are not allowed under any circumstance to downgrade or deviate from the established RWP procedures.	PLNT SRC	4/30/2021
92712_SAFE CAPS_SAFE _003	(RC-1) SAFE issued Safety Bulletin #21-06a, "ROADWAY-WORKER-IN-CHARGE (RWIC) Responsibilities" which reemphasizes the RWIC's primary duties and that personnel are not free to "downgrade" or alter safety equipment requirements when setting up a work area.	SAFE SRC	6/22/2021

Appendices

Appendix A - Root Cause Analysis



Appendix B - PLNT Safety Bulletin/Safety Stand Down

Office of Plant Maintenance

Safety Bulletin

PSB: 20210409-1
April, 2021

Subject: Improper Work Zone Setup

From: [redacted]

To: PLNT Employees

Summary of Events

On Friday, April 9, 2021, a Plant Maintenance (PLNT) crew reported to their assigned work location, FA-10 egress shaft. The FA-10 egress shaft is located between Tenleytown and Friendship Heights stations on the A-line between tracks 1 and 2. The egress stair tower, which terminates in this location, is not protected by handrail.

The Roadway Worker in Charge (RWIC) possessed approved GOTRS Rights for tracks 1 and 2 between chain markers 271+00 and 283+00. The RWIC received permission from ROCC to hot stick and confirm that power was de-energized on both tracks. After confirming power at 1:46 AM, the RWIC informed ROCC that he needed the track rights for **safety purposes only and none of his personnel would be entering the roadway**. ROCC repeated back and instructed the RWIC to notify ROCC if personnel would be entering the roadway at any time. ROCC granted permission to start work at 1:47 AM.

The RWIC conducted a safety briefing and informed his crew that they would be working under Exclusive Track Occupancy (ETO) Protection. At 2:15 AM, the RWIC notified ROCC that he observed PM54 entered his work zone on track 1. The initial investigation of egress shaft FA-10 at CM 277+27, revealed that the PLNT crew was working on what is classified as roadway. SAFE received notification and the incident remains under investigation.

Initial Findings

The RWIC failed to recognize that the work area, lacking protective handrail, was considered Roadway in accordance with MSRPH 5.4.1, which reads:

> *In tunnel areas, it is all areas between tunnel walls to include all safety walks and open shafts and ancillary areas. Vent shafts and emergency egress shafts, with handrails or protective railings are NOT considered part of the Roadway.*

Installation of all safety equipment as required in MSRPH 5.13.2 and 5.13.7 was required to prevent this type of occurrence from happening.

SAFETY IS OUR #1 PRIORITY.

PSB 20210409-1

Attachment 2 – Page 1 of 3.

Improper Work Zone Setup….*Cont'd*

Corrective Action:

When setting up ETO work zones where power is deenergized, all applicable safety devices shall be installed including; shunts, lights, mats and WSADs.

The RWIC **is not** allowed under any circumstances to downgrade or deviate from the established Roadway Worker Protection procedures.

Note: Egress Shafts, not protected by handrail, are considered Roadway.

SAFETY IS OUR #1 PRIORITY.

PSB 20210409-1

Attachment 2 – Page 2 of 3.

M E M O R A N D U M

ACKNOWLEDGEMENT FORM

Office of Plant Maintenance

Improper Work Zone Setup Safety Bulletin
(PSB: 20210409-01)

A. I acknowledge that I received a copy of PLNT Safety Bulletin #20210409-1 regarding Improper Work Zone Setup.

B. I agree to the findings and corrective actions explained in this Bulletin.

C. I understand that if I have any questions after reading PSB #20210409-01, that were not addressed in the Bulletin, or if I encounter any problems, I should contact my supervisor.

[redacted]

Employee Name (Print) Employee Signature

[redacted]

Employee ID Date

Washington Metropolitan Area Transit Authority

Attachment 2 – Page 3 of 3.

Appendix C – PLNT – General Orders & Track Rights System

GOTRS - GENERAL ORDERS & TRACK RIGHTS SYSTEM
Track Rights Request

Request Summary

Request Number:	202108403103	**Track Access:**	True
Dates Requested:	04/09/2021 00:30 to: 04/09/2021 04:00	**Clear In Ten:**	False
Request Status:	Closed	**Equipment on Track:**	1
Requestor:	[redacted]	**Allow Piggybacks:**	True
Requestor Organization:	PLNT/BMSS	**In Piggyback:**	No
Switch Order:		**Power Outage:**	Supervisory
Lock Out / Tag Out:		**Additional AC:**	
Request Title:	A07 TENLEYTOWN FA10 EMERGENCY EGRESS STAIRS REPAIR		

Location, Work Type and Description

Location:	Mainline
Non-Wayside Location Type:	
Request Type:	Expedited
Charge Job Number:	[redacted]
Contract Number:	
Maximo Work Order:	
Request Group:	No
Location Description:	
Request Description:	EMERGENCY REPAIR OF EGRESS STAIRS FOR FA10
Work Type:	Fan/Vent Shaft
Meeting Location:	
PB Meeting Location:	
Tools and Equipment:	PM34, SAFETY EQUIPMENT, HAND TOOLS, WELDING EQUIPMENT
Equipment on Track:	PM34 OUT OF E99

Track 1			Track 2		
Actual Work Area:	A276+00	A278+00	**Actual Work Area:**	A276+00	A278+00
Protected Work Area:	A271+00	A283+00	**Protected Work Area:**	A271+00	A283+00

Hot Stick Info. Third Rail Gaps:

From	To	Track ID
A256+50	A308+31	1
A256+50	A305+31	2

Date & Time

Start: 04/09/2021 00:30 **End:** 04/09/2021 04:00

Contacts

Entered by **Requestor**

As of 04/10/2021 13:22
1 of 3

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GOTRS - GENERAL ORDERS & TRACK RIGHTS SYSTEM
Track Rights Request

Request Summary

Request Number:	202108403103	**Track Access:**	True
Dates Requested:	04/09/2021 00:30 to: 04/09/2021 04:00	**Clear In Ten:**	False
Request Status:	Closed	**Equipment on Track:**	1
Requestor:	[redacted]	**Allow Piggybacks:**	True
Requestor Organization:	PLNT/BMSS	**In Piggyback:**	No
Switch Order:		**Power Outage:**	Supervisory
Lock Out / Tag Out:		**Additional AC:**	
Request Title:	A07 TENLEYTOWN FA10 EMERGENCY EGRESS STAIRS REPAIR		

[redacted]
Work: [redacted]
Cell: [redacted] **Home:** [redacted]

[redacted]
Work: [redacted]
Cell: [redacted] **Home:** [redacted]

WMATA Manager

[redacted]
Work: [redacted]
[redacted]

Emergency Contact

[redacted]
[redacted]
[redacted]

Support

SUPPORT GROUP	Crew Size
PLNT	6

ESCORT GROUP	Crew Size
PLNT	6

Request Change History

Date	Event
03/30/2021 18:24	Request was replicated from Request 202108403100.
04/07/2021 18:25	Request status was changed to Approved
04/09/2021 03:12	Work Prep was completed.
04/09/2021 04:27	Request status was changed to Opened
04/09/2021 08:35	Request status was changed to Closed

Request Group

Request Number	Description

Piggyback

No active piggybacks found

As of 04/10/2021 13:22
2 of 3

Attachment 3 – Page 2 of 3.

GOTRS - GENERAL ORDERS & TRACK RIGHTS SYSTEM
Track Rights Request

Request Summary

Request Number:	202108403103	**Track Access:**	True
Dates Requested:	04/09/2021 00:30 to: 04/09/2021 04:00	**Clear In Ten:**	False
Request Status:	Closed	**Equipment on Track:**	1
Requestor:	[redacted]	**Allow Piggybacks:**	True
Requestor Organization:	PLNT/BMSS	**In Piggyback:**	No
Switch Order:		**Power Outage:**	Supervisory
Lock Out / Tag Out:		**Additional AC:**	
Request Title:	A07 TENLEYTOWN FA10 EMERGENCY EGRESS STAIRS REPAIR		

Red Tag information

Red Tag #: Request is not Red Tag.

Close-Out Summary

Final Status:	Closed
Request To Begin Work:	04/09/2021 00:27
Request to De-Energize:	04/09/2021 01:34
De-Energization Completed; RWIC notified:	04/09/2021 01:47
Hot Stick:	04/09/2021 01:47

From	To	Track ID	Waive(?)	Unit #	Chain Marker	Entered By	Date
A256+50	A305+31	2		[redacted]	A278+00	[redacted]	04/09/2021 01:47
A256+50	A308+31	1		[redacted]	A278+00	[redacted]	04/09/2021 01:47

Permission Given To Setup Work Site:	04/09/2021 01:47
Start Work:	04/09/2021 01:48
Work Site Cleared by Requestor:	04/09/2021 03:31
OCC Comments:	
OCC Assistant Superintendent Comments:	
Requestor Comments:	

OCC Delays

Delay #	From	To	Reason	Re-Hot Stick Done
1	04/09/2021 02:43	04/09/2021 03:31	Pending investigation.	

As of 04/10/2021 13:22
3 of 3

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Appendix D – ROCC Lessons Learned Notice

ROCC Rail Operations Control Center

September 18, 2020

Lessons Learned: Improper Use of Foul Time Protection

Key Point:
Foul Time (FT) Protection

5.13.5 Foul Time Protection (FT) as outlined in the MSRPH, is defined in part as *a method of RWP in which a qualified Level 2 or Level 4 Roadway Worker requests that ROCC STOP all rail vehicle movement in a specific area for a limited amount of time...FT may be granted to individuals who are RWP Level 2 or RWP Level 4 qualified that are accessing rooms along the Roadway, to include vent shafts, who are not engaged in work activities.*

Incident Analysis:

Earlier this month, a power work crew had GOTRS rights for a supervisory power outage for the replacement of platform edge lights at Tysons Corner (N02) station. Third rail power was de-energized as part of this work. Approximately 20 minutes into the shift, the RWIC downgraded the work to a non-power outage and third rail power was restored and work continued as scheduled. A Safety Officer observed the work crew on the roadway without the proper protection and brought the improper setup of the work location to the immediate attention of the work crew and the Control Center. All work was stopped and the work crew was instructed to clear the work area.

Findings:

Shortly after third rail power was re-energized, the RWIC requested *and was granted* foul time protection in order to continue the scheduled work. Maintenance crews were on the roadway while in the performance of their duties with third rail power energized with no shunts or mats in place or an AMF for a duration of two (2) hours and 16 minutes under foul time protection.

Raising Awareness:

This incident will continue to be a topic during ROCC manager-led discussions, during documented safety briefings and will be reiterated by ROCC managers during one-on-one discussions with all Rail Traffic Controllers. Questions and/or concerns regarding this topic must be brought to the immediate attention of an ROC Manager.

Corrective Actions:

Although foul time is not defined by a specific amount of time, it is not intended to be used as a level of protection while performing work within an established work zone. And as mentioned in the definition, foul time may be granted to individuals who are not engaged in work activities. Foul time should not be requested or granted for work being conducted on the roadway for an extended period of time.

Prior to granting foul time, ascertain the requestor's purpose to ensure the proper level of protection is in use. Rail Traffic Controllers must also remind personnel working on the roadway to ensure the appropriate safety equipment (i.e. shunts, mats, WSADs, etc.) are used accordingly to prevent injury and/or damage to equipment.

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Appendix E – PLNT – Roadway Job Safety Briefing (RJSB)

WMATA ROADWAY JOB SAFETY BRIEFING FORM

DATE: 4/9/21 TRACK TIME ON/OFF: 1:48 / 3:30

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

RWIC's CELL PHONE NUMBER: 301-442-6021 RADIO OPS CHANNEL: V

SAFETY RULE OF THE DAY: Wear All PPE

WORK ASSIGNMENT: Repair Egress Stairs DIRECTION OF TRAFFIC: INBOUND [X] OUTBOUND [X]

RAIL LINE: A B C D E F G J K L N TRACK 1 [X] 2 [X] 3 [ ] WORK LIMITS CHAIN MARKER(s): A276+00 - A278+00

PLACE OF SAFETY: S Bound

TYPE OF PROTECTION(s): IT [ ] ETO AUTHORITY [X] ETO LOCAL SIGNAL [ ] AMF [ ] FT [ ]

REQUEST FROM ROCC: BLOCK CALLS [X] CANCEL AUTOMATIC SIGNALS [X] PROHIBIT EXITS [X]

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 [X] NO POWER OUTAGE [ ]

RED TAG NUMBER: [ ] RED TAG HOLDER: [ ]

WATCHMAN/LOOKOUT ASSIGNED: Yes [ ] No [X] 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 [X] 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): [ ] PIGGY BACK WORKZONE CM(s): [ ]

PIGGY BACK WORK ASSIGNMENT: [ ]

NUMBER OF RMM(s): [ ] RMM OPERATIONS IN WORK ZONE: [ ]

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

WEATHER CONDITIONS	[ ]	TRIPPING HAZARDS / UNEVEN WALKING SURFACES	[X]
TRACK GRADE AND VISIBILITY	[ ]	POOR LIGHTING / TUNNEL AND VENT SHAFT(S)	[X]
HAZARDS ASSOCIATED WITH RAIL VEHICLE MOVEMENT	[ ]	TRAIN / CURVE SPEED(s)	[ ]
WORK SITE CONDITIONS AND ACTIVITIES	[X]	ETS BOX(s) LOCATIONS	[ ]
EMERGENCY PROCEDURES	[ ]	EQUIPMENT AND TOOL SAFETY	[X]
ADJACENT TRACK PROTECTION	[X]	ROTATION AND RELIEF PROCEDURES	[ ]

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

Attachment 6 – Page 1 of 3

WMATA ROADWAY JOB SAFETY BRIEFING FORM

DATE: 4/8/21 TRACK TIME ON/OFF: ____/____

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

RWIC's CELL PHONE NUMBER: [redacted] RADIO OPS CHANNEL: 1

SAFETY RULE OF THE DAY: Wear All PPE

WORK ASSIGNMENT: Repair Stairs DIRECTION OF TRAFFIC: INBOUND [X] OUTBOUND [X]

RAIL LINE: (A) B C D E F G J K L N TRACK 1 X 2 X 3 ___ WORK LIMITS CHAIN MARKER(s): 271+00 – 283+00

PLACE OF SAFETY: Shaft

TYPE OF PROTECTION(s): IT ____ ETO AUTHORITY X ETO LOCAL SIGNAL ____ AMF ____ FT ____

REQUEST FROM ROCC: BLOCK CALLS [X] CANCEL AUTOMATIC SIGNALS [X] PROHIBIT EXITS [X]

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 X 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 X 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): ____ PIGGY BACK WORKZONE CM(s): ____

PIGGY BACK WORK ASSIGNMENT: N/A

NUMBER OF RMM(s): ____ RMM OPERATIONS IN WORK ZONE: ____

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

WEATHER CONDITIONS	[ ]	**TRIPPING HAZARDS / UNEVEN WALKING SURFACES**	[✓]
TRACK GRADE AND VISIBILITY	[✓]	**POOR LIGHTING / TUNNEL AND VENT SHAFT(S)**	[✓]
HAZARDS ASSOCIATED WITH RAIL VEHICLE MOVEMENT	[✓]	**TRAIN / CURVE SPEED(s)**	[ ]
WORK SITE CONDITIONS AND ACTIVITIES	[✓]	**ETS BOX(s) LOCATIONS**	[ ]
EMERGENCY PROCEDURES	[ ]	**EQUIPMENT AND TOOL SAFETY**	[ ]
ADJACENT TRACK PROTECTION	[✓]	**ROTATION AND RELIEF PROCEDURES**	[ ]

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

Attachment 6 – Page 2 of 3

WMATA ROADWAY JOB SAFETY BRIEFING FORM

ROADWAY WORKERS HAVE THE RIGHT AND RESPONSIBILITY TO INITIATE A GOOD FAITH CHALLENGE WHEN NECESSARY

Inspect PPE [X] Inspect RWP Sticker [X] Inspect Radio(s) Certification Due Date [X] Perform Radio Check(s) [ ]

ROADWAY WORKER ACKNOWLEDGEMENT

I understand and agree with all aspects of the Roadway Job Safety Briefing I just received. I feel I am adequately protected from any train movement or roadway hazards. I understand I have a responsibility to conduct myself in a safe manner at all times.

Roadway Worker Signature	Employee/Contractor ID #	Crew Leader(s) Signature/ID#		Radio Call #
[redacted]				

RWIC COMMENTS: _____

RWIC SIGNATURE [redacted] DATE/TIME: 4/8/21/3:00

RELIEVING RWIC: _____ DATE/TIME: _____

GOOD FAITH CHALLENGE INFORMATION

EMPLOYEE(s) NAME: _____ EMPLOYEE(s)# _____ DATE/TIME _____

RWP ISSUE(s) _____ ISSUED RESOLVED: Yes___ No___

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

Attachment 6 – Page 3 of 3

Appendix F – ROCC Radio RTC Refresher Training

ROCC
Rail Operations Control Center

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]	Sun / Mon	4/10/21

RTD Date*	Incident Date	Incident Type
N/A	N/A	Review of Owl Shift Operations

Rule/Violation	Post Incident?	Date Cleared Medical
N/A	N/A	N/A

Brief Synopsis of Incident or Reason Out

This refresher served as a proactive catalyst for operational logistics on the owl shift. All owl shift RTC's will receive this refresher training.

Area Below for ROCC Manager Conducting Refresher Use Only

Dates of Training: April 10, 2021

Instruction Provided:	S.O.P #28 Protecting Work Zones, Verification of breakers, RTC Teams and accountability, Clearing work zones, Setting up work zones, Red Tag execution, COVID cleaning at work zones (delays in GOTRS), System opening and closing procedures, Off-duty times and power restoration and foul time activities shall be completed prior to relinquishing control of console, E-line power restoration activities shall be done together from E-07 to E-10

How could incident have been prevented?

N/A Refresher training provided to prevent incidents from occurring

RTC	**Signature & Date**	[redacted] 4-10-2021
ROCC Manager [redacted]	**Signature & Date**	[redacted] 4-10-21

Created February 2, 2021

Attachment 7 – Page 1 of 1.

Appendix G – Roadway-Worker-In-Charge (RWIC) Safety Bulletin

Washington Metropolitan Area Transit Authority
Department of Safety and Environmental Management

Safety Alert

SA #21-06a **June 2021**

ROADWAY-WORKER-IN-CHARGE (RWIC) Responsibilities

A trend has emerged recently among Roadway Worker Protection (RWP) incidents where the Roadway-Worker-In-Charge (RWIC) was found to be in non-compliance with work zone requirements or performing tasks outside the scope of the RWIC's responsibilities.

Consequently, the purpose of this Safety Alert is to clarify and reinforce the RWIC's responsibilities. The RWIC performs a critical safety function and therefore, must focus solely on their responsibilities as reflected in the RWP Quick Access Guide and Metro's Safety Rules and Procedures Handbook (Section 5 – RWP, clause 5.10.2 Roadway Worker in Charge).

The core RWIC functions are summarized as follows:

1. **Responsible for the safety of all Roadway Workers within the working limits at all times.**
2. **Ensures proper transfer of authority to the incoming RWIC before leaving the working limits.**
3. **Ensures the Roadway Job Safety Briefing (RJSB) is provided to all Roadway Workers before their entry onto the Roadway.**
4. **Establishes protections within the working limits to provide Ample Time/Warning for workers to move to a place of safety before the arrival of a rail vehicle within their working limits.**
5. **Responsible for Roadway Workers' compliance with all rules, procedures and work instructions within the working limits**
6. **Responsible for all tools, equipment, and materials within specified working limits.**

Remember, there is no such thing as a "downgrade" to RWP compliance.
All the requirements associated with establishing a workzone in accordance with the RWP program must be complied with to ensure the safety checks and balances are in place to keep you and your teammates safe while working on the roadway.

RWIC Authority
Once an area or zone has been given to the RWIC, the ROCC nor anyone else has jurisdictional authority. Unless there is an emergency and the area deemed safe by the RWIC to relinquish back to the ROCC, the RWIC has ultimate authority and responsibility for the area or zone where they have been placed in charge. No movement of equipment or assignments to personnel can be given unless the RWIC determines it is safe and provides authorization. All personnel are required to respect the RWIC's focus on the safety of the crew. Requesting a RWIC to leave the working limits requires either a transfer of authority to another RWIC or clearing of the work area.

If you have any questions regarding this Safety Bulletin, please reach out for SAFE via the Safety Hotline at 301-955-7150.

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Appendix H – Interview Summaries

Rail Operations Control Center (ROCC)

ROCC Radio RTC

The ROCC Radio RTC is a WMATA employee with one year of service with approximately two months of experience as an RTC. The WMATA employee certified as an RTC on February 22, 2021, and their RWP Level 2 certification expires May 31, 2021. This employee has no history of sleep issues to report.

Based on the SAFE interview, the ROCC Radio RTC stated they were in the role of the ROCC Radio RTC at the time of the Improper RWP incident and reported that they were fully alert. A PLNT-RWIC had GOTRS rights for a Supervisory Power Outage with ETO RWP at Tenleytown Station, Tracks 1 and 2. After the PLNT-RWIC hot-sticked and confirmed third rail power was de-energized, the PLNT-RWIC reported to the ROCC Radio RTC that both tracks are down for safety only and there will be no equipment or personnel on the roadway. The ROCC Radio RTC granted the PLNT-RWIC permission to start work and instructed for them to contact the ROCC if personnel need to enter the roadway. Since the PLNT-RWIC was engaged in work activities in the vent shafts and not being on the roadway, the ROCC Radio RTC thought it was ok for the RWIC not to setup their safety equipment. The ROCC Radio RTC stated they did not know the vent shafts and emergency egress shafts did not have handrails or protective railings and was considered part of the roadway. The ROCC Radio RTC did not ask if the area the PLNT-RWIC was working in was protected by handrails or protective railings because it's common for RWICs to downgrade from supervisory power outages and not setup equipment, so nothing stood out to them about the request. The ROCC Radio RTC was unaware of a playbook for the ROCC to utilize as a checklist to ensure quality. The ROCC Radio RTC expressed that they felt the training they received was sufficient enough for them to do their job.

Additionally, the ROCC Radio RTC stated they can ask their manager for help with the training if they felt they needed more help or training. Since this incident, the ROCC Radio RTC had safety conversations with ROCC personnel to prevent a reoccurrence. During the RTC training process, the instructor infrequently went over previous Lessons Learned incidents to use as guidance for after graduation. During the interview, SAFE went over ROCC Lessons Learned for Improper Use of FT Protection developed on September 18, 2020, discussing the work crew who downgraded from supervisory power to non-power outages. The ROCC's corrective actions for this incident were to enforce whatever the scheduled GOTRS rights protection indicated and not allow personnel to downgrade. The ROCC Radio RTC stated they were unaware of the ROCC's Lessons Learned and corrective actions developed on September 18, 2020. Additionally, SAFE went over ETO requirements per MSRPH 5.13.5 and What is the Roadway per MSRPH 5.4.1 with the RTC.

Office of Plant Maintenance (PLNT)

Sheet Metal Technician AA - RWIC

The Sheet Metal Technician AA is a WMATA employee with 15.5 years of service. The Sheet Metal Technician AA held various job grade levels (i.e., Grades D, C, B, A, and AA). The Sheet Metal Technician AA, RWP Level 4 certification expires October 31, 2021. This employee has no history of sleep issues to report.

The Sheet Metal Technician AA was assigned as the RWIC when the improper RWP event occurred on April 9, 2021, at approximately 02:10 hours. The nature of work was to repair the Tenleytown Station, FA10 Vent Shaft, and Emergency Egress stairs. The PLNT-RWIC indicated they performed an RJSB before work commenced, and all crew members were wearing proper PPE. The PLNT-RWIC performed the RJSB outside the vent shaft, and there was a total of five personnel in the work crew, which included all WMATA, PLNT employees. After the PLNT-RWIC reported to the ROCC that they hot-sticked and confirmed third rail power had been de-energized, the PLNT-RWIC received permission from the ROCC to enter the roadway, setup up equipment, and start work. The PLNT-RWIC expressed to the ROCC that both tracks were down for safety only, and there will be no equipment or personnel on the trackbed, and the work crew will only be working in the FA-10 Vent and Emergency Egress Shaft. The PLNT-RWIC never indicated to the ROCC that the vent shaft and emergency egress area they worked in did not have handrails or protective railings. The PLNT-RWIC indicated that they are familiar with the requirements of WMATA, Section 5 – RWP Manual, 5.4.1 "What is the Roadway," but made the decision to deviate from procedures and not setup ETO, RWP based on not needing access to the trackbed and the PLNT-RWIC indicated they never expected for a rail vehicle to come through their work zone. The decision was made to cancel the Supervisory Power Outage with ETO, RWP, and downgrade their protection form on the job site. The PLNT-RWIC expressed that they felt the training received from PLNT management and the training department was not sufficient enough for them to do their job. However, the PLNT-RWIC indicated that they could ask their manager for help with the training if they felt they needed more help or training.