750 First St. NE • Ste. 900 • Washington, D.C. 20002 Office: 202-384-1520 • Website: www.wmsc.gov

WMSC Commissioner Brief: W-0264 – Improper Roadway Worker Protection – Foggy Bottom-GWU Station – January 16, 2023

Prepared for Washington Metrorail Safety Commission meeting on April 9, 2024

Safety event summary:

A Roadway Worker In Charge (a Structures Supervisor) entered the roadway without protection, and without following all required steps of Metrorail's third-rail electrical safety process, after communicating with a Power Desk Controller regarding a power outage that was required for their work area.

The Roadway Worker In Charge had reported the crew's location on the Foggy Bottom-GWU Station platform to the Rail Traffic Controller for planned track bed cleaning work and requested their planned protected work area from east of Foggy Bottom-GWU Station to west of Rosslyn Station. The Rail Traffic Controller properly did not grant permission to enter the roadway due to continuing vehicle movement in the area.

Metrorail's third rail power procedures require communication between the Roadway Worker In Charge, Power Desk, and Rail Traffic Controllers to ensure safe energization and de-energization of power. The communication during this event, including when the Roadway Worker In Charge spoke with the Power Desk Controller to initiate the third rail power outage request associated with this work area, did not comply with the process. The Roadway Worker In Charge also attempted to "downgrade" the electrical protection from a "red tag" power outage – when breakers are racked out to further reduce the risk of accidental re-energization of third rail power – to a "supervisory" power outage – when the power is remotely de-energized using Metrorail's Advanced Information Management (AIM) SCADA system. The Rail Traffic Controller informed the Roadway Worker in Charge to contact the Power Desk, and the red tag outage process was initiated.

In accordance with Metrorail procedure, the Power Desk Controller informed the Rail Traffic Controller when the breakers had been racked out to ensure power would remain de-energized. However, the Power Desk Controller then informed the Roadway Worker In Charge that they could "commence hot sticking activities." Only the Rail Traffic Controllers, not Power Desk Controllers, can provide permission and protection to enter the roadway. Rail vehicle movement continued in the area, including the vehicle assigned to this work zone, Prime Mover 38, which moved into the area after this communication, and other vehicle movement. The Roadway Worker In Charge entered the roadway based on the exchange with the Power Desk Controller and proceeded to "hot stick" (check to verify that third rail power was de-energized). The Power Desk logs for the switch order state that two locations were checked – C2 089+21 (a location west of Foggy Bottom Station within a red hot spot identified in Metrorail's Quick Access Guide) and C2 145+19 (a location just west of Rosslyn Station) – however, there is no record of the phone or radio communication that would have been required to communicate that information. Metrorail procedures require the hot sticking of all sections of third rail within the work area.

The Rail Traffic Controller identified that the Roadway Worker In Charge had entered the roadway without permission or protection when the Power Desk Controller issued the power outage red tag identification number to the Roadway Worker In Charge, and the Roadway Worker In Charge reported to the Rail Traffic Controller that those steps had been completed.

After the Rail Traffic Controller properly identified this safety issue, they had further conversations with the Power Desk Assistant Superintendent, Power Desk Controller, and Roadway Worker In Charge, informed the Roadway Worker In Charge to remain clear of the roadway, and subsequently directed the Roadway Worker In Charge to turn in the red tag. However, when the Power Desk Controller asked the Roadway Worker In Charge whether all equipment and personnel were clear of the roadway, even after the Rail Traffic Controller had again instructed the crew at 1:57 a.m. and 2:17 a.m. to remain clear of the roadway, the Roadway Worker In Charge said at 2:22 a.m. that no, personnel were not clear. At 2:31 a.m., the Roadway Worker In Charge turned in the red tag to the Power Desk Controller.

In addition to the deviations from the safety processes described above, the investigation also identified inconsistencies in how the process is explained within Metrorail's SOP 2 to ensure that protection is in place.

For a red tag power outage, "the PDC shall authorize the RWIC to carry out hot stick activities to confirm the respective de-energization of third rail power with the RTC." The next step listed is that "The RWIC shall contact the RTC to ensure RWP protections are in place to enter the roadway to hot stick all gaps and confirm the third rail is de-energized." For a supervisory power outage, "the PDC shall advise the RWIC to separately contact the RTC to arrange hot sticking activities." The next step listed is that "The RWIC shall contact the RTC to ensure RWP protections are in place (i.e. ETO) to enter the roadway to hot stick all gaps and confirm the third rail is de-energized."

Investigative interviews also identified that the work crew had not completed their Roadway Job Safety Briefing as required prior to requesting access to the roadway.

Probable Cause:

The probable cause of this event was not following Metrorail's existing roadway worker protection requirements, and unclear communication practices between field personnel and the Power Desk. Contributing to this event was the unclear language of Metrorail's SOP 2.

Corrective Actions:

Metrorail issued a Safety Bulletin regarding roadway access authorization and the associated authorities of Power Desk Controllers and Rail Traffic Controllers (note: a separate safety event investigation report covers the January 29, 2023 event also referenced in this February 8, 2023 Safety Bulletin as relating to entering the roadway without protection after communicating with the Power Desk Controller. The other event involved a supervisory power outage).

Metrorail updated SOP 2 to standardize the language for supervisory and red tag third rail power outages. (scheduled completion date May 2024)

Metrorail updated the General Orders and Track Rights System (GOTRS) steps used to validate the process to match the revised SOP 2 language. (scheduled completion date May 2024)

Metrorail provided refresher Roadway Worker Protection training to the Roadway Worker In Charge.

Example of other related open CAPs:

- CAP C-0212 (replaced C-0037) addresses safe third rail power procedures. Under this CAP, Metrorail has developed the Power Desk and associated processes. The expected completion date is August 2024.

WMSC staff observations:

Metrorail did not conduct the post-event toxicology testing for this safety event as required by its procedures for those who may have contributed to the event. Neither the Roadway Worker In Charge nor the Power Desk Controller were removed from service. The WMSC is conducting an audit that includes Metrorail's fitness for duty programs.

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

FINAL REPORT OF INVESTIGATION A&I E23030

Date of Event:	01/16/23
Type of Event:	O-23: Improper Roadway Worker Protection (RWP)
Incident Time:	01:48 hours
Location:	Foggy Bottom, Track 2
Time and How received by SAFE:	01:54 hours Mission Assurance Coordinator (MAC)
WMSC Notification Time:	02:45 hours
Responding Safety Officers:	N/A
Rail Vehicle:	N/A
Injuries:	None
Damage:	None
Emergency Responders:	None
SMS I/A Number	20230116#105522

Foggy Bottom Station – Improper RWP

January 16, 2023

Table of Contents

Abbreviations and Acronyms

AIMS	Advance Information Management System
ARS	Audio Recording System
CAP	Corrective Action Plan
CCTV	Closed-Circuit Television
GOTRS	General Orders and Track Rights System
ETO	Exclusive Track Occupancy
MSRPH	Metrorail Safety Rules and Procedures Handbook
NOAA	National Oceanic and Atmospheric Administration
PDAS	Power Desk Assistant Superintendent
PDC	Power Desk Controller
PM	Prime Mover
RJSB	Roadway Job Safety Briefing
RTC	Rail Traffic Controller
RTRA	Office of Rail Transportation
ROCC	Rail Operations Control Center
RWIC	Roadway Worker in Charge
SAFE	Department of Safety
SMS	Safety Measurement System
WMATA	Washington Metropolitan Area Transit Authority
WMSC	Washington Metrorail Safety Commission

Executive Summary

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

On January 16, 2023, a Roadway Worker In Charge (RWIC), along with contractors, were scheduled to complete track bed cleaning at Foggy Bottom Station on track 2. To initiate the work zone setup, the RWIC contacted the Rail Operations Control Center (ROCC) Radio Rail Traffic Controller (RTC) and requested activation of their General Orders and Track Rights System (GOTRS) work zone at 00:51 hours. The request included a red tag power outage and Exclusive Track Occupancy (ETO) protection at Foggy Bottom Station on track 2. The RWIC informed the Radio RTC that Prime Mover (PM) 38 was coming from Brentwood Yard and they needed PM38 at Foggy Bottom Station, track 2 for their work assignment. The RTC acknowledged and repeated the request details back. They then instructed the RWIC to stand by and stand clear of the roadway.

At 01:02 hours, the RTC contacted the Power Desk Assistant Superintendent (PDAS) to initiate the power outage for the RWIC's work assignment. The PDAS verified the switch order identification number and contacted the Power Desk Controller (PDC) to inform them that switching could begin. After the breakers were verified as racked out, the PDC contacted the RTC and notified them that they could give the RWIC permission to hot stick. At 01:20 hours, the PDC then contacted the RWIC and advised them that they could "commence hot sticking activities." Following this phone conversation, the RWIC entered the roadway and hot sticked the third rail at two locations. However, the RWIC failed to contact the Radio RTC to verify that ETO protection was established before entering the roadway. The RWIC completed hot sticking and received their Red Tag from the PDC at 01:43 hours, before the violation was identified. The violation was identified by the Radio RTC after they were contacted by the RWIC and notified that they had their Red Tag. The Radio RTC then instructed the RWIC to turn in their Red Tag to the Power Desk and to clear the roadway. There were no injuries or damage from this event.

The probable cause for this Improper RWP Event was a failure to follow established procedures by the RWIC. After being notified that the power was deenergized, they were required to contact the RTC to confirm that RWP protections were in place before entering the roadway. Contributing factors to the event were a miscommunication between the PDC and RWIC and unclear language in SOP 2 that resulted in the RWIC believing they had permission to enter the roadway.

Incident Site

Tunneled Track with several red hot spot locations in the protected work zone.

Field Sketch/Schematics

Figure 1: This was the approximate protected work zone location.

Purpose and Scope

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

Investigative Methods

The investigative methodologies included the following:

- Site assessment through video and documents review.

- Formal Interviews – SAFE interviewed four individuals as part of this investigation. The interviews included persons present at, during, and after the incident, those directly involved in the response process, and representatives from the Washington Metrorail Safety Commission (WMSC). SAFE interviewed the following personnel:

    - RWIC
    - Radio RTC
    - Button RTC
    - Power Desk Controller

- Informal Interviews – Collected through conversations with individuals during the investigation to provide background and supporting information. Written statements were reviewed from personnel present during the event.

- Documentation Review – A collection of relevant work history information and process documentation contained in Metro systems of record. These records include:
    - Metrorail Safety Rules and Procedures Handbook (MSRPH)
    - National Oceanic and Atmospheric Administration (NOAA)
    - RWIC's 30 Work History
    - RWIC Training Record

- General Orders and Track Rights System (GOTRS)
- Roadway Job Safety Briefing (RJSB) Form
- ROCC Incident Report

- System Data Recording Review – A collection of information contained in Metro Data Recording Systems. This data includes:
  - Audio Recording System (ARS) playback include OPS 2 Radio, Telephone
  - AIMS Playback

Investigation

On January 16, 2023, a RWIC, along with contractors, was scheduled to complete track bed cleaning at Foggy Bottom Station on track 2. At 00:50 hours, the RWIC contacted the Radio RTC to request their red tag power outage, and ETO protection at Foggy Bottom Station on track 2. The RWIC informed the Radio RTC that PM38 was coming from Brentwood Yard, and they needed PM38 at Foggy Bottom Station, track 2 for their work assignment. At that time, the Radio RTC told the RWIC to contact the Power desk and to stand by for ETO protection. The RWIC informed the Radio RTC that was not necessary for a red tag power outage but contacted the PDC anyway. When speaking on the phone, the PDC informed the RWIC they did not need to contact them for a red tag power outage. At 01:04 hours, the Radio RTC contacted the PDAS to give them the red tag for the RWIC's work assignment. At 01:18 hours, the PDAS contacted the PDC to inform them that the switch order was authorized. The PDC contacted the power crew and instructed them to execute the switch order. At 01:20 hours, the PDC contacted the RWIC and advised them that they could, "commence their hot sticking activities."

There are 10 red tag and/or supervisory power outages per night per Operations line.

After speaking with the PDC, the RWIC entered the roadway and hot sticked the third rail gaps without contacting the Radio RTC to confirm ETO protection was established as required in SOP 2. Only after the RWIC receives confirmation from the RTC that ETO protection is in place, are they granted permission to enter the roadway. SOP 2 prescribes some differences in the way Supervisory and Red Tag requests are executed; however, both require that some form of RWP protection be in place before entering the roadway.

At 01:43 hours, the PDC contacted the RWIC to issue them their red tag. The GOTRS Switch Order indicates Chain Markers C2 089+21 and C2 145+19 were provided as the hot stick locations; however, the phone or radio call that contains that information was not found in the Audio Recording System (ARS). Shortly after, the RWIC contacted the Radio RTC to inform them that they had possession of their red tag. At 01:48 hours, the Radio RTC contacted the PDC to inquire how the RWIC was issued their red tag when they never granted them ETO protection. The Radio RTC informed them ETO protection was never granted because they had one unit that needed to use the interlocking to cross over from track 2 to track 1. The RWIC was advised to stand by and stand clear. At 02:31 hours, the RWIC turned in their red tag to the PDC.

There are two elements to hot sticking contained within SOP 2. For a red tag power outage, "the PDC shall authorize the RWIC to carry out hot stick activities to confirm the respective de-energization of third rail power with the RTC." The next step listed is that "The RWIC shall contact the RTC to ensure RWP protections are in place to enter the roadway to hot stick all gaps and confirm the third rail is de-energized".

For a supervisory power outage, "the PDC shall advise the RWIC to separately contact the RTC to arrange hot sticking activities." The next step listed is that "The RWIC shall contact the RTC to

ensure RWP protections are in place (i.e. ETO) to enter the roadway to hot stick all gaps and confirm the third rail is de-energized."

Chronological Event Timeline

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

Time	Description
00:50:56 hours	RWIC: Contacted the Radio RTC to request red tag outage, ETO protection, at Foggy Bottom, Track 2 and they had a PM38 coming from Brentwood Yard. [Ops. 2]
00:51:30 hours	Radio RTC: Gave a 100% repeat back, instructed the RWIC to stand by and stand clear, and contact the Power Desk. [Ops. 2]
00:52:37 hours	RWIC: Gave 100% repeat back. [Ops. 2]
00:52:55 hours	RWIC: Contacted the Power Desk and was informed they did not have to make a request to the Power Desk for a red tag. [Phone]
00:54:13 hours	RWIC: Contacted the Radio RTC via landline and informed them they did not have to contact the Power Desk for a red tag, only for a supervisory. They only have to make the request to ROCC and wait. When they called the Power Desk, they were told they did not have to call right now. [Phone]
01:02:15 hours	Radio RTC: Contacted the Power Desk Assistant Superintendent to give them the switch order information for the RWIC's work zone. [Phone]
01:04:13 hours	Power Desk Assistant Superintendent: Contacted the PDC to permit the Switch Order execution procedure by TRPM to begin. [Phone]
01:07:50 hours	Power Unit: Contacted the Power Desk Controller to request permission to rack out breakers. [Phone]
01:13:04 hours	Power Unit: Contacted the Power Desk Controller to provide block tag for racked out breakers. [Phone]
01:18:24 hours	Power Desk Controller: Contacted the RTC to inform them that all the breakers for the RWIC's red tag had been racked out and they could grant them permission to hot stick at their discretion. [Phone]
01:20:05 hours	Power Desk Controller: Contacted the RWIC to inform them all the breakers were racked out at their location, and they could, "commence hot sticking activities." [Phone]
01:23 hours	PM38 arrives to work location. [Ops.2]
01:43:18 hours	Power Desk Controller: Contacted the Power Desk Assistant Superintendent to initiate a Step 5 for the red tag. [Phone]
01:43:30 hours	Power Desk Controller: Contacted the RWIC to issue them their red tag. [Phone]
01:44:13 hours	RWIC: Contacted the Radio RTC to inform them they were in possession of their red tag. Radio RTC informed them to stand by for their ETO protection. [Ops. 2]
01:48:48 hours	Radio RTC: Contacted the Power Desk to ask if the red tag was ready. The Power Desk informed them the tag was issued to the RWIC. Power Desk gave them permission to hot stick and the RWIC hot sticked and then gave them chain markers. At that point, they issued the red tag. The Radio RTC informed the Power Desk Controller they never gave the RWIC ETO protection to hot stick. The Power Desk Controller then stated the RWIC is still supposed to contact the ROCC for permission to enter the roadway. [Phone]
01:57:01 hours	Radio RTC: Informed the RWIC to continue to stand by and stand clear. [Ops.2]

Time	Description
01:57:24 hours	Radio RTC: Contacted the Power Desk Assistant Superintendent to ask who provided the CMs for the red tag that was provided to the RWIC. They informed them they were unaware because that information does not come to them. It's the Power Desk Controller that receives the CMs and they instruct the RWIC to contact the ROCC for roadway. [Phone]
02:13:45 hours	Power Desk Assistant Superintendent: Contacted the Radio RTC to ask if the RWIC was going to turn in the red tag. The Radio RTC informed them the RWIC will have to turn in the red tag, but they will not restore power to that red tag. [Phone]
02:17:10 hours	Radio RTC: Instructed the RWIC to give them landline. [Ops. 2]
02:17:40 hours	RWIC and RTC discussed the event and the RTC advised the RWIC that they accessed the roadway without permission or protection. The RWIC was advised to expect a call from their supervisor and to turn in their Red Tag. [Phone]
02:22:46 hours	RWIC: Contacted the Power Desk Controller because they were instructed to turn in their red tag. The Power Desk Controller asked if all equipment and personnel were clear for the roadway. The RWIC stated no and they would call them back. [Phone]
02:31:29 hours	RWIC: Contacted the Power Desk to turn in their red tag. [Phone]
02:33:04 hours	RWIC: Contacted the Radio RTC and asked if their supervisor called. They mentioned they turned in the red tag as well. [Phone]

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

Automated Information Management System (AIMS)

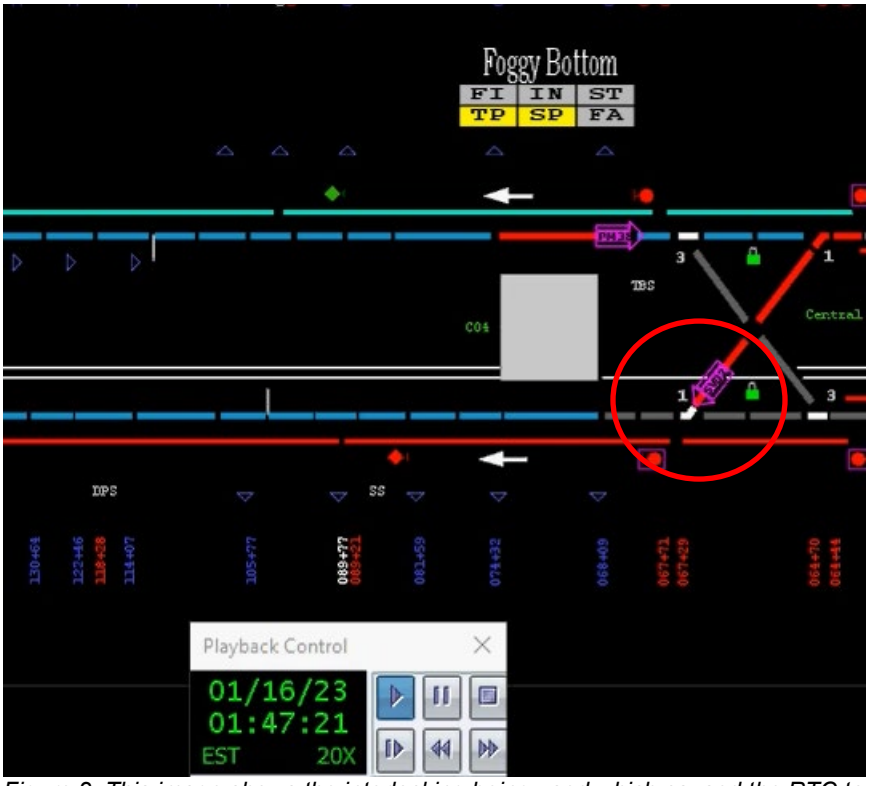


Figure 2: This image shows the interlocking being used which caused the RTC to not grant ETO protection.

Interview Findings

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

RWIC

During the interview, the RWIC stated when they initially requested their red tag power outage the Radio RTC kept telling them to contact the Power Desk and they knew that was not necessary but still contacted them. The PDC informed the RWIC they did not need to call for a red tag power outage. The RWIC stated once the PDC authorized them to hot stick their gaps, they proceeded and entered the roadway. The RWIC acknowledged they failed to confirm ETO protection was established with the Radio RTC before entering the roadway to hot stick. The RWIC mentioned that there are different procedures to follow in order to request power be deenergized and hot sticking for a supervisory power outage compared to red tag power outage. The Radio RTC did not initially grant the RWIC ETO protection because there was one more rail vehicle that needed to use the interlocking to cross over from track 2 to track 1. The RWIC completed a RJSB while they waited for their red tag.

PDC

The PDC stated once the PDAS contacted them, they started to execute the switching order. During the interview, the PDC mentioned how they understood how the RWICs can be confused when they state they may commence hot sticking activity. The PDC felt the impacted departments should be included in the development process for SOP development and revision.

Weather

On January 16, 2023, at the time of the incident, NOAA recorded the temperature as 30°F, with clear skies. This happened in an area of tunnel track and weather was not a contributing factor in this incident (Weather source: NOAA) – Location: Washington, DC.)

6.8.10 The PDC shall confirm via AIM the correct breakers were opened and match the Switch Order details. If accurate, the PDC shall complete GOTRS SO Step 3: De-Energization.

6.8.11 The PDC shall authorize the RWIC to carry out Hot-Stick activities to confirm the respective de-energization of the Third Rail power with the RTC.

6.8.12 The RWIC shall contact the RTC to ensure RWP protections are in place to enter the Roadway to Hot-Stick all gaps and confirm the Third Rail is de-energized.

6.8.13 The RWIC shall complete Hot-Stick, and inform the PDC of:

- Unit Number(s);
- Track ID; and
- Chain Markers.

6.8.14 The PDC shall complete GOTRS SO Step 4: Hot-Stick and enters the required information.

6.8.15 The PDC shall call the PDAS to advise Hot-Stick is complete.

6.8.16 The PDAS shall verify Hot-Stick locations and completes GOTRS Step 5: Verification and informs the PDC of the Red Tag Identification Numbers.

6.8.17 The PDC shall notify the RWIC of the relevant Red Tag ID numbers for their work area and states that the RWIC is now in possession of the Red Tags. The PDC shall then complete GOTRS SO Step 6: Issue Red Tag.

6.8.18 Upon receipt of the Red Tag Identification Number, the RWIC shall contact the RTC and confirm possession of the Red Tag Identification Number(s).

6.8.19 Once GOTRS Switch Order Execution Step 6 is complete, the RTC shall confirm GOTRS Request Close-Out Step, "De-energization Complete/RWIC notified" has been automatically completed.

Figure 3: This image shows the step in SOP 2 for hot sticking for a red tag power outage that the RWIC failed to follow.

6.6.12 The PDC shall advise the RWIC to separately contact the RTC to arrange hot sticking activities

6.6.13 The PDC shall confirm with the RTC that the requested Supervisory outage is now active.

6.6.14 The RTC shall confirm via AIM that the Supervisory Third Rail Power Outage for the GOTRS RID defined work area has been activated.

6.6.15 The RWIC shall contact the RTC to ensure RWP protections are in place (i.e. ETO) to enter the Roadway to Hot-Stick all gaps and confirm the Third Rail is de-energized.

Figure 4: This image shows the different hot sticking language in SOP 2 for a supervisory power outage.

5.13.7 Exclusive Track Occupancy (ETO)

Exclusive Track Occupancy (ETO) may be issued only by the Rail Traffic Controller to employees who holds a current Level 4 RWP qualification.

ETO may be used as a method of establishing working limits on controlled track where the track within working limits shall be placed under the control of one RWIC by either:

a. Authority issued to the RWIC by the RTC who controls train movements on the track, or
b. The RWIC causing fixed signals at each entrance to the working limits to display an aspect indication "Stop." (Local Signal Control)

5.13.7.1 Action Required Prior to Issuance

The Rail Traffic Controller must not issue ETO authority until:

a. The affected track is clear of movements that are not part of the workgroup, AND
b. Controlled signals leading to and within the affected track are set to display a Stop indication, AND
c. Blocking devices are applied to the controls of switches and signals leading to the affected track.

These signals must not be displayed for movement leading to the affected track.

5.13.7.2 Establishing ETO Limits

Each end of the ETO limits must be defined by one of the following physical features:

a. Clearly identifiable Chain Marker Location
b. A fixed signal that displays an aspect indicating "Stop."
c. Station, or other physical characteristic location.
d. Track barricade or flagman at a designated location.

5.13.7.3 ETO Set-Up

ETO working limits supplemental protection must be placed prior to beginning scheduled work. This supplemental protection includes the placement of shunts accompanied by two (2) red lanterns or e-flares placed a minimum of 500' beyond the outside of the work area to define the working limits, as well as "End Work Area" mats placed at both ends of the work area.

Figure 5: This image explains why the Radio RTC did not initially grant the RWIC ETO protection because another unit was crossing off to track 1 using the interlocking in the RWIC's protected work zone.

Roadway Worker In Charge (RWIC) Responsibilities:

RWIC Personal Protective Equipment:

- WMATA approved certified and working radio
- Accurate watch
- Approved, certified and working Hot Stick or Voltage Awareness Device (VAD), as required
- Whistle
- High-voltage electrical safety gloves, as required

Core Supervisory Functions:

1. Rules compliance, oversight and safety within the working limits at ALL times, as per WMATA SOPs and MSRPH, employing sound and safe judgement, including escorting contractors and visitors
2. Refer to the Third Rail Power Section of MSRPH SOP 28 if any power outages are necessary.
3. Sole responsibility for overseeing set up of all On-Track safety protection: Exclusive Track Occupancy (ETO), Inaccessible Track (IT), FT and Advanced Mobile Flagger (AMF)
4. Ensures all work zones are set up to provide appropriate level of protection for Roadway Workers.
5. Establish 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 into their work zone.
6. Ensures all Roadway Workers receive the RJSB prior to entering the Roadway.
7. Responsible for all Roadway Workers, communications and equipment within the specified working limits.
8. Responsible for overseeing set up of any piggyback work zone in accordance with the MSRPH.
9. RWIC will remain within the working limits while Roadway Workers are on the Roadway or have an assigned and Level 4 qualified RWIC in their temporary absence.
10. Monitors correct radio operation channels (OPS) while on the Roadway at all times. Will use a cell phone in emergency situations if needed.
11. Clears all Roadway Workers and equipment from the work zone to a place of safety when communications with ROCC are disrupted in any way.
12. RWIC is the only authorized person to:
    - Approve all work crew(s), rail vehicles and equipment to occupy the working limits
    - Remove any person who is deemed unsafe from the Roadway

Figure 6: This image shows some of the core responsibilities established for RWIC in the MSRPH.

Clear View: Interlocking	C-03	C-04	064+00	068+00
Foggy Bottom Station	**C-04**	**C-04**	**068+00**	**074+00**
Clear View	C-04	C-05	074+00	084+00
Clear View: Curve	C-04	C-05	084+00	089+00
Turbulent Air Vortex	C-04	C-05	089+00	121+00
Blind Spot: Curve	C-04	C-05	121+00	135+00
Clear View	C-04	C-05	135+00	139+00

Figure 7: This image shows the known red hot spots in the RWIC's work zone according to the RWP Quick Access Guide.

Human Factors

Evidence of Fatigue

We evaluated conditions at the time of the incident to distinguish whether evidence of fatigue was present. No video of the involved person was available to ascertain whether evidence of fatigue was present. The RWIC reported feeling fully alert at the time of the incident. The RWIC reported experiencing no symptoms of fatigue in the time leading up to the incident.

Fatigue Risk

We evaluated incident data for fatigue risk factors. No significant risk was identified. The incident time of day did not suggest an increased risk of fatigue-related impairment. The RWIC reported keeping a regular sleep schedule in the days leading up to the incident. The RWIC worked night shift in the days leading up to the incident. The RWIC was awake for 6.8 hours at the time of the incident The RWIC reported being off in the 24 hours preceding the incident. The off-duty period was 38 hours which provides an opportunity for 7-9 hours of sleep. This was more than the RWIC's usual workday sleep durations. The RWIC reported no issues with sleep.

Work History

- The RWIC did not work any overtime in the two weeks leading up to the incident.
- The RWIC was disciplined in 2021 for an RWP violation. The RWIC entered the roadway without securing foul time to set up their work area as required.

Training and Certifications (RWIC)

- Completed RWP Safety Standdown in September 2022.
- Completed RWP Requalification Level 4 practical assessment in November 2022.
- Completed RWP Level 4 CBT in November 2022.

Post-Incident Toxicology Testing

Post-Incident Toxicology Testing was not conducted for this event.

Findings

- The RWIC was scheduled to work under a red tag power outage with ETO protection.
- The Radio RTC did not initially grant ETO protection because a roadway maintenance machine needed to use the interlocking to cross over from track 2 to track 1.
- The PDC authorized the RWIC to commence hot sticking activities.
- The RWIC failed to contact the Radio RTC for permission to enter the roadway to complete their hot sticking activities.
- The phone call from the RWIC to the PDC that relayed the chain markers that were hot sticked was not found in the voice recording system.
- There is different hot sticking language for a supervisory power outage compared to red tag power outage; however, both require permission from the RTC to enter the roadway.

Immediate Mitigation to Prevent Recurrence

- The RWIC's work assignment was cancelled for the night.
- The RWIC will have to complete RWP Level 4 refresher training.

Probable Cause Statement

The probable cause for this Improper RWP Event was a failure to follow established procedures by the RWIC. After being notified that the power was deenergized, they were required to contact the RTC to confirm that RWP protections were in place before entering the roadway. Contributing factors to the event were a miscommunication between the PDC and RWIC and unclear language in SOP 2 that resulted in the RWIC believing they had permission to enter the roadway.

Recommended Corrective Actions

Corrective Action Code	Description	Responsible Party	Estimated Completion Date
105522_SAFE CAPS_SAFE_001	Standardize language for both supervisory and red tag power outages within SOP 2.	SAFE	05/31/2024
105522_SAFE CAPS_SAFE_002	Update GOTRS SOP 2 steps to match revised language in SOP 2	SAFE/IT	05/31/2024
105522_SAFE CAPS_SAFE_003	Issue Safety Bulletin regarding PDC and RTC roadway authorization.	SAFE	Completed
105522_SAFE CAPS_TRST_001	The RWIC will have to complete RWL Level 4 refresher training.	TRST	Completed

Drafted By: SAFE 703 – 03/11/2023
Reviewed By: SAFE 71 – 03/16/2023
Approved By: SAFE 71 – 03/17/2023

Appendices

Appendix A – Interview Summaries

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

RWIC

The RWIC is a Structural Supervisor and WMATA employee with 24.5 years of experience, with 10 years as a Structural Supervisor. The RWIC previously worked as a Custodian and Custodian Supervisor. The RWIC is RWP Level 4 certified and will have to recertify by November 2023. The RWIC mentioned feeling fully alert during their work shift. The RWIC mentioned not having any personal commitments that may interfere with their opportunity to get quality sleep. The RWIC works the 22:00 – 06:00 shift.

The RWIC stated their work assignment on the night of the incident was track bed cleaning at Foggy Bottom Station, track 2. The RWIC had a red tag power outage with ETO protection to complete their work assignment. The RWIC mentioned when they initially radioed to the Radio RTC to request their red tag, there was a discrepancy because the Radio RTC was telling the RWIC to contact the Power desk and the RWIC was trying to tell them that was not necessary for a red tag power outage. The RWIC mentioned there is a difference when you request a red tag power outage compared to a supervisory power outage. The RWIC stated the difference with the new SOP 2 procedures is when you request a supervisory power outage the Radio RTC gives you ETO protection and you can start setting up your work zone with the power up and when you request a red tag you have to wait for Power desk to contact you to hot stick. The RWIC stated that normally the Radio RTC gives you ETO protection and then the Power Desk calls you to hot stick your gaps but that didn't happen. The RWIC later realized that didn't happen because another unit still needed to use the interlocking to cross over to track 1. The RWIC completed a RJSB with the contractors while they waited for the red tag. The PDC authorized the RWIC to commence hot sticking activities and the RWIC proceeded to enter the roadway and hot stick their gaps. The RWIC stated the PDCs should not authorize hot sticking activities if they are not aware whether a RWIC has ETO protection or not. The RWIC then called the PDC with their gaps and the PDC issued them their red tag. The RWIC then called the Radio RTC to inform them that they were in possession of their red tag. The Radio RTC then instructed them to stand by and stand clear. The RWIC mentioned the new SOP 2 procedures slows down the work time in the field. The RWIC stated with the new procedures the RWICs are responsible for duties that Power personnel used to do, hot sticking[1]. During the interview, the RWIC expressed concerns with the communication between the Radio RTCs and PDCs, the training they received for the new SOP 2 procedures, and the time it takes to complete the new RJSB form.

PDC

The PDC is a WMATA employee with 9 years of experience, with 1.5 years as a PDC. The PDC previously worked as a Bus Operator. The PDC is RWP Level 2 certified and will have to recertify by June 2023. The PDC last certified as a PDC in February 2023. The PDC mentioned feeling fully alert during their work shift. The PDC mentioned not having any personal commitments that

[1] In previous versions of SOP 2, the Power Crew that executed the power operation would hot stick after opening breakers and then the RWIC would hot stick at the work location.

Drafted By: SAFE 703 – 03/11/2023
Reviewed By: SAFE 71 – 03/16/2023
Approved By: SAFE 71 – 03/17/2023

may interfere with their opportunity to get quality sleep. The PDC was working the 22:00 – 06:00 shift the week of the incident.

The PDC stated the typical duties for a PDC on the midnight shift included overseeing the de-energization and re-energization of third rail power, supervising AC tags, and maintenance crews doing power-related work on the railroad. The PDC stated it was a normal workday. The PDCs work alone but communicate with work personnel via telephone and radio. The PDC stated they are restricted to ten or less power outages a night per operations channel. It's typically a mixture of supervisory and red tag power outages. The PDC stated they were very familiar with the SOP 2 procedures. The PDC was asked if they thought the new SOP 2 procedures were safer and more efficient than the last SOP procedures and their response was, "no." The PDC stated in the old SOP 2 procedure there was a Power crew that completed the hot sticking activities but now it's the RWIC's responsibility in the new SOP 2 procedures. They mentioned how the RWICs could be confused when the PDCs inform them they can commence hot sticking activities. The PDC suggested that the red tag procedures mirror the same steps as a supervisory tag. The PDC stated they completed a 2 hour training regarding the policy changes of SOP 2. The PDC felt there should be more involvement by front line and various departments when developing SOPs. The PDC and Buttons RTC speak periodically throughout the night. The PDC stated it would not be feasible to contact the RTCs to make sure ETO was granted for every work area. There is no way for the PDC to know ETO protection was granted until they get to the close out screen.

Button RTC [2]

The Button RTC is a WMATA employee with 1.5 years of experience and a half year as a Button RTC. This is the only position this employee has worked at WMATA. The Button RTC is RWP Level 2 certified and will have to recertify in December 2023. The Button RTC was not removed from service to complete a post incident testing. The Button RTC mentioned feeling fully alert at the time of the incident. The Button RTC worked the 22:00 – 06:00 hours shift the week of the incident. The Button RTC did not have any personal or non-work related circumstances affecting their sleep. The Button RTC stated during the overnight shift they make sure the various work zones are set up and make sure the necessary units get to their work locations. The Button RTC stated there's only 10 supervisory and/or red tag power outage per night on their line. The Button RTC felt very familiar with SOP 2 but thought there should be additional training. The Button RTC did not feel like they were able to ask job-specific questions during the training they received.

Radio RTC[3]

The Radio RTC is a WMATA employee with 4.5 years of experience. The Radio RTC has only worked as an RTC. The Radio RTC is RWP Level 4 certified and will have to recertify by October 2023. The Radio RTC last recertified as a RTC in March 2022. The Radio RTC was not removed from service for post incident testing. The Radio RTC stated they felt fully alert at the time of the incident. The Radio RTC stated they usually get 7 hours of sleep on workdays and there is nothing affecting their chance to get good sleep. The Radio RTC stated they are responsible for most of the paperwork that needs to be completed during the overnight shift. The Radio RTC mentioned being very familiar with SOP 2 but thought there were various levels of understanding of the new SOP 2 procedures among all personnel. The Radio RTC felt that additional training would help parties involved but did not provide specifics about which aspects of the SOP were misunderstood.

[2] The interview recording failed and IT was unable to recover it. Summary was prepared from Investigator's notes.
[3] The interview recording failed and IT was unable to recover it. Summary was prepared from Investigator's notes.

Appendix B – Roadway Job Safety Briefing

WMATA Roadway Job Safety Briefing Form

This form must be completed legibly and accurately and be retained and made available for inspection for a period of 90 days.

Part 1: General Job Briefing

1	Date: 1/15/23	Time: :	RWIC: [redacted]
	RWIC Call #: [redacted]		RWIC Cell Phone #: [redacted]
2	Safety Contact: PPE		
	RWP Rule: SOP 28 COS		
3	Work Location: Foggy Bottom		
	Job Task(s): TBC		
4	Worksite, Electrical, Chemical, or Environmental Hazards: Poor lighting Road Noise		
5	PPE Inspected: ☑	Electronic Device Policy Reviewed: ☑	Radio Certification Date Inspected: ☑
	RWP Stickers Inspected: ☑	Tools and Equipment Inspected: ☑	Radio Checks Performed: ☑
	What Specialized PPE Will Be Used? Hearing Protection		
6	Emergency Response Plan: Contact Rail/MOC 962-1926		

Part 2: RWP Briefing: This section must be filled out before any Roadway Workers enter the Roadway.

**Track Time On/Off: __:__ / __:__ , __:__ / __:__ , __:__ / __:__ **

7	Rail Line: C	Track Number(s): 2	Track Access Guide (TAG) Speed:
	Working Limits Chain Markers: M5+19 C064+70		
	OPS Radio Channel: 2	OPS Phone Number: [redacted]	
	Place of Safety: Catwalk/L/Platform		Time Needed to Reach Place of Safety:
	Are There Red Hot Spots Within Your Working Limits? Yes ☑ No ☐		
	Red Hot Spot Chain Markers: C0+00 + 68+00 80+00 85+00 89+00 131+00 121/00 135+00	Red Hot Spot Hazard(s): Switch/Work, Curve Curve Turbulent Curve	
8	Form of RWP: IT ☐ ETO Authority ☐ Local Signal Control ☐ AMF ☐ FT ☐		
	RWP Notes: All PPE Required		
9	Advanced Mobile Flagger Call #(s) or Last Name(s):		
	Advanced Mobile Flagger Placement:		
	Watchman/Lookout Placement:		
	Required Site Distance:	Watchman/Lookout Rotation Schedule:	
10	Will There be a Speed Restriction on the Adjacent Track? Yes ☐ No ☑		
	How Will the Speed Restriction be Implemented?		
11	Will Class 2 Vehicles be Part of the Working Limits? Yes ☑ No ☐		
	# of Class 2 Vehicles: 1	Type of Class 2 Vehicles: PM 88	

FORM-SAFE-SRM-001-00 52.002 06/22

Attachment 1 of 2: This is the first page of the completed RJSB form.

WMATA Roadway Job Safety Briefing Form

This form must be completed legibly and accurately and be retained and made available for inspection for a period of 90 days.

Part 2: RWP Briefing, continued:

12	Power Outage: Red Tag ☑ Supervisory ☐		Hot Sticking Chain Markers: 089+21 145+19	
	Red/Supervisory Tag #: 2023016508-A			
	Red/Supervisory Tag Holder: [redacted]			
	Insulated Mat(s) Color Blue ☑ Red ☐ Green ☐ Orange ☑ Yellow ☐			
	WSAD Certification Due	WSAD Serial #/Asset ID	WSAD Certification Due	WSAD Serial #/Asset ID
	3 / 10 / 23	T0009876	/ /	
	/ /		/ /	
13	Will a Piggyback Crew(s) be Working Within Your Working Limits? Yes ☐ No ☐			
	Crew Leader/EIC Call #(s):		Piggyback Work Area Chain Markers:	
	Piggyback Work Assignment(s):			

Part 3: Good Faith Challenge: The following must be read aloud by the RWIC to the Roadway Workers.

"WMATA guarantees each Roadway Worker the right to challenge, in good faith, the effectiveness of the Roadway Worker Protection being provided. The Roadway Worker making the challenge, and those that are sympathetic to the challenge, shall remain clear of the roadway until the challenge has been resolved."

RWP Issues:	Worker Name(s):
	Was the GFC Issue Resolved? Yes ☐ No ☐

Part 4: Roadway Worker Acknowledgement

"I understand and agree with all aspects of the Roadway Job Safety Briefing I just received. 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 WORKERS HAVE THE RIGHT AND RESPONSIBILITY TO INITIATE A GOOD FAITH CHALLENGE WHEN NECESSARY

Roadway Worker Signature	Employee ID #	Roadway Worker Signature	Employee ID #	Crew Leader/EIC Signature	Crew Leader/EIC Employee ID #
[redacted]	[redacted]	[redacted]	[redacted]		
[redacted]	[redacted]				
[redacted]	[redacted]				
[redacted]	[redacted]				
[redacted]	[redacted]				
[redacted]	[redacted]				
[redacted]	[redacted]				
[redacted]	[redacted]				
[redacted]	[redacted]				

Part 5: RWIC Signature(s)

Additional RWIC Comments:		
RWIC Signature: [redacted]	RWIC Employee ID #: [redacted]	Date: 1 / 16 / 2023
Relieving RWIC Name:	Relieving RWIC Employee ID #:	
Relieving RWIC Signature:	Date/Time: / / , :	
Relieving RWIC Call #:	Relieving RWIC Cell Phone #:	

FORM-SAFE-SRM-001.00

Attachment 2 of 2: This is the second page of the completed RJSB form.

Appendix C – General Rights & Track Rights System

GOTRS - GENERAL ORDERS & TRACK RIGHTS SYSTEM
Track Rights Request

Request Summary

Request Number:	202221702307	**Track Access:**	True
Dates Requested:	01/16/2023 00:00 to: 01/16/2023 04:00	**Clear In Ten:**	False
Request Status:	Closed	**Equipment on Track:**	0
Requestor:	[redacted]	**Allow Piggybacks:**	True
Requestor Organization:	TRST/STRUC	**In Piggyback:**	No
Switch Order:	Closed (2023016508)	**Power Outage:**	Red Tag
Lock Out / Tag Out:	No	**Additional AC:**	
Request Title:	STMN Systemwide PM C05-C04		

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:	TBC and Drains
Work Type:	Other
Meeting Location:	C05
PB Meeting Location:	
Tools and Equipment:	PPE, Hand Tools, Safety Equipment
Equipment on Track:	

	Track 2	
Actual Work Area:	C145+19	C069+70
Protected Work Area:	C150+19	C064+70

Hot Stick Info. Third Rail Gaps:

From	To	Track ID
C064+70	C089+21	2
C089+77	C145+19	2

Date & Time

Start: 01/16/2023 00:00 **End:** 01/16/2023 04:00

Contacts

Entered by **Requestor**

As of 01/25/2023 07:08
1 of 6

Attachment 1 of 6: This is the completed GOTRS for the work assignment.

GOTRS - GENERAL ORDERS & TRACK RIGHTS SYSTEM
Track Rights Request

Request Summary

Request Number:	202221702307	**Track Access:**	True
Dates Requested:	01/16/2023 00:00 to: 01/16/2023 04:00	**Clear In Ten:**	False
Request Status:	Closed	**Equipment on Track:**	0
Requestor:	[redacted]	**Allow Piggybacks:**	True
Requestor Organization:	TRST/STRUC	**In Piggyback:**	No
Switch Order:	Closed (2023016508)	**Power Outage:**	Red Tag
Lock Out / Tag Out:	No	**Additional AC:**	
Request Title:	STMN Systemwide PM C05-C04		

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

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

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

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

Support

SUPPORT GROUP	Crew Size
TRST/STRUC	2
ESCORT GROUP	**Crew Size**
TRST/TRACK	1
SMNT/PWR	2

Request Change History

Date	Event
10/26/2022 19:11	Request was replicated from Request 202221702300.
12/30/2022 17:47	Request was edited. Field(s) changed: Maximo Work Order.
01/06/2023 18:35	Request was edited. Field(s) changed: Location. Location: Track 2 Actual: C145+19 C064+70 Protected: C150+19 C059+64 to Track 2 Actual: C145+19 C069+70 Protected: C150+19 C064+70.
01/09/2023 15:58	Request status was changed to Approved
01/16/2023 02:26	Work Prep was completed.

As of 01/25/2023 07:08
2 of 6

Attachment 2 of 6: This is the completed GOTRS for the work assignment.

GOTRS - GENERAL ORDERS & TRACK RIGHTS SYSTEM
Track Rights Request

Request Summary

Request Number:	202221702307	**Track Access:**	True
Dates Requested:	01/16/2023 00:00 to: 01/16/2023 04:00	**Clear In Ten:**	False
Request Status:	Closed	**Equipment on Track:**	0
Requestor:	[redacted]	**Allow Piggybacks:**	True
Requestor Organization:	TRST/STRUC	**In Piggyback:**	No
Switch Order:	Closed (2023016508)	**Power Outage:**	Red Tag
Lock Out / Tag Out:	No	**Additional AC:**	
Request Title:	STMN Systemwide PM C05-C04		

Request Change History

Date	Event
01/16/2023 02:34	Work Prep was edited. Field(s) changed: Unit #, Requestor Comment. Unit #: [redacted]. Requestor Comment: RWIC-[redacted] to RWIC-[redacted].
01/16/2023 02:37	Work Prep was edited. Field(s) changed: Unit #, Requestor Comment. Unit #: [redacted] Requestor Comment: RWIC-[redacted] to RWIC-[redacted]
01/16/2023 04:20	Work Prep was edited. Field(s) changed: Equipment. Equipment: PM26-B99 Yard to PM45-C99 Yard.
01/16/2023 04:54	Work Prep was edited. Field(s) changed: Equipment. Equipment: PM45-C99 Yard to PM38-B99 Yard.
01/16/2023 05:51	Request status was changed to Opened
01/16/2023 08:23	Request status was changed to Closed

Request Group

Request Number	Description

Piggyback

No active piggybacks found

Switch Order

SO #:	**2023016508**
SO Status:	Closed
Lock Out/ Tag Out:	No

Location & Equipment Requested

C05TB (C145+19) C04TB (C069+70) TRK 2

Remarks:

Red Tag Information

Tag #:	Red Tag

As of 01/25/2023 07:08
3 of 6

Attachment 3 of 6: This is the completed GOTRS for the work assignment.

GOTRS - GENERAL ORDERS & TRACK RIGHTS SYSTEM
Track Rights Request

Request Summary

Request Number:	202221702307	**Track Access:**	True
Dates Requested:	01/16/2023 00:00 to: 01/16/2023 04:00	**Clear In Ten:**	False
Request Status:	Closed	**Equipment on Track:**	0
Requestor:	[redacted]	**Allow Piggybacks:**	True
Requestor Organization:	TRST/STRUC	**In Piggyback:**	No
Switch Order:	Closed (2023016508)	**Power Outage:**	Red Tag
Lock Out / Tag Out:	No	**Additional AC:**	
Request Title:	STMN Systemwide PM C05-C04		

De-Energization

Equipment Location	Equipment
C04TB	44
C04TP	34
C04TP	32
C05TB	42

Energization

Equipment Location	Equipment
C04TB	44
C04TP	34
C04TP	32
C05TB	42

Close-Out Summary

Final Status:		Closed
RWIC has contacted RTC to establish working limits:		01/16/2023 00:51
Authorize Switch Order Execution:		01/16/2023 01:02
De-Energization Completed/RWIC notified:		01/16/2023 01:43
Hot Sticking:	Waived Reason: Other Comment: Chain markers given to the power desk	01/16/2023 03:21
Permission is given to setup worksite:		step not done
RTC authorization to start work is given to RWIC:		step not done
PDC confirmed working limits are clear:		01/16/2023 02:32
RTC confirmed working limits are clear:		01/16/2023 03:23
Energization by PDC completed:		01/16/2023 04:44
Work Stopped by RTC:		01/16/2023 08:23

As of 01/25/2023 07:08
4 of 6

Attachment 4 of 6: This is the completed GOTRS for the work assignment.

GOTRS - GENERAL ORDERS & TRACK RIGHTS SYSTEM
Track Rights Request

Request Summary

Request Number:	202221702307	**Track Access:**	True
Dates Requested:	01/16/2023 00:00 to: 01/16/2023 04:00	**Clear In Ten:**	False
Request Status:	Closed	**Equipment on Track:**	0
Requestor:	[redacted]	**Allow Piggybacks:**	True
Requestor Organization:	TRST/STRUC	**In Piggyback:**	No
Switch Order:	Closed (2023016508)	**Power Outage:**	Red Tag
Lock Out / Tag Out:	No	**Additional AC:**	
Request Title:	STMN Systemwide PM C05-C04		

Attachment 5 of 6: This is the completed GOTRS for the work assignment.

GOTRS - GENERAL ORDERS & TRACK RIGHTS SYSTEM
Track Rights Request

Request Summary

Request Number:	202221702307	**Track Access:**	True
Dates Requested:	01/16/2023 00:00 to: 01/16/2023 04:00	**Clear In Ten:**	False
Request Status:	Closed	**Equipment on Track:**	0
Requestor:	[redacted]	**Allow Piggybacks:**	True
Requestor Organization:	TRST/STRUC	**In Piggyback:**	No
Switch Order:	Closed (2023016508)	**Power Outage:**	Red Tag
Lock Out / Tag Out:	No	**Additional AC:**	
Request Title:	STMN Systemwide PM C05-C04		

Close-Out Summary

Reason: Poor radio communications

Rail Traffic Controller Comment:

Assistant Operations Manager Comment:

Requestor Comment:

Delays

Attachment 6 of 6: This is the completed GOTRS for the work assignment.

Appendix D – Switch Order

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
GENERAL ORDERS AND TRACK RIGHTS SYSTEM
SWITCH ORDER

SWITCHING ORDER: 2023016508 STATUS: Closed

LOCATION & EQUIPMENT REQUESTED: C05TB (C145+19) C04TB (C069+70) TRK 2

DATES NEEDED: 01/16/2023 THRU 01/16/2023 TIME FROM: 00:00 TO: 04:00

DATE APPROVED: 01/11/2023 TIME APPROVED: 13:18

LOCK OUT / TAG OUT: No

EQUIPMENT CONFIRMED DE-ENERGIZED BY UNIT:

OUTAGE REQUESTED BY: [redacted] OF: TRST/STRUC PHONE: [redacted]

EMERGENCY CONTACT: [redacted] EMERGENCY CONTACT PHONE: [redacted]

TAG #: 2023016508-A RAIL SUPPORT REQUEST: 202221702307

GIVEN TO: 697 OF: TRST/STRUC ON: 01/16/2023 AT: 01:43

CLEARED BY: 697 OF: TRST/STRUC ON: 01/16/2023 AT: 02:32

REMARKS:

CANCELLATION DATE: TIME: REASON:

DE-ENERGIZED							ENERGIZED						
DESK OPR	Unit #	DATE	TIME	LOCATION	EQUIPMENT	TAG PLACED	DESK OPR	Unit #	DATE	TIME	LOCATION	EQUIPMENT	TAG REMOVED
[redacted]	1380	1/16/2023	01:16	C04TB	44	199	[redacted]	1365	01/16/2023	04:44	C04TB	44	199
[redacted]	1379	1/16/2023	01:13	C04TP	34	2111		1365	01/16/2023	04:02	C04TP	34	2111
[redacted]	1379	1/16/2023	01:13	C04TP	32	2112		1365	01/16/2023	04:02	C04TP	32	2112
[redacted]	1360	1/16/2023	01:18	C05TB	42	1748		1365	01/16/2023	04:44	C05TB	42	1748

Switch Order 2023016508 Execution Steps

Step 1 Start Switch Order Execution - Completed
Recorded by [redacted] at 01/16/2023 01:04

Step 2 Verified crew is on location with Switch Order and PPE **Completed**
Recorded by [redacted] at 01/16/2023 01:06

As of 01/30/2023 11:57
1 of 2

Attachment 1 of 2 - GOTRS Switch Orders Page 1 of 2.

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
GENERAL ORDERS AND TRACK RIGHTS SYSTEM
SWITCH ORDER

Step 3 De-Energization - Completed
Recorded by [redacted] at 01/16/2023 01:18

Step 4 Hot Sticking - Completed
Recorded by [redacted] at 01/16/2023 01:43

Step 5 Verification - Completed
Recorded by [redacted] at 01/16/2023 01:43
Comments:

Step 6 Issue Red Tag - Completed
Recorded by [redacted] at 01/16/2023 01:43

Step 7 Clear Red Tag - Completed
Recorded by [redacted] at 01/16/2023 02:32

Step 8 Permission received from Power Desk Assistant Superintendent to energize - Completed
Recorded by [redacted] at 01/16/2023 03:52
Comments:

Step 9 Energization - Completed
Recorded by [redacted] at 01/16/2023 04:44

Switch Order 2023016508 De-Energize Circuit Testing

Track 2 C089+21 tested by 697 and X
Recorded by [redacted] at 01/16/2023 01:42

Track 2 C145+19 tested by 697 and X
Recorded by [redacted] at 01/16/2023 01:43

Attachment 2 of 2: GOTRS Switch Order page 2. Hot Sticking Chain Markers Highlighted

Appendix E – Safety Bulletin: Power Disconnected: Differences between RTC and PDC Roadway Authorizations

SAFETY BULLETIN | RAIL | SB 23-02-B Version #: 1 Issue Date: 2/8/23

Power Disconnected: Differences Between RTC and PDC Roadway Authorizations

OVERVIEW

Roadway Worker Protection (RWP) is intended to provide personnel with a uniform method of establishing on-track protection while minimizing the dangers and hazards of working on the roadway. Third-rail power outages, in conjunction with establishing working limits, are frequently used to protect from the hazards associated with performing work where the third rail is present.

There have been two recent RWP violations involving roadway workers performing hot sticking activities prior to receiving proper roadway access authorization and protection.

- On January 16 & 29, 2023: Roadway workers entered the roadway prior to establishing working limits via Exclusive Track Occupancy/Inaccessible Track (ETO/IT). After receiving notification from the Power Desk Controller (PDC) to hot stick, the Roadway Worker in Charge (RWIC) failed to contact the Rail Traffic Controller (RTC) to ensure that working limits protection was established (SOP 2, Section 6.8.12 – Third Rail Power Energization and De-energization Procedures).

DETAILS AND ACTIONS

In both January incidents, the RTC could not grant working limits (ETO/IT) to the RWIC at the initial request time due to rail vehicle movement within the area. One incident involved a Third Rail Red Tag Power Outage, and the other involved a Third Rail Supervisory Power Outage.

RTC Authorization

An RTC must verify that all Class 1 rail vehicles (electric vehicles) are clear of the affected area and protect the area affected by the third rail outage by displaying red signals and establishing prohibit exits before authorizing the removal of third rail power. These protections must be established anytime third rail power is removed to prevent routing of electric vehicles inadvertently into a de-energized track section.

Upon receiving authorization from the PDC to hot stick, the RWICs involved in these incidents did not verify with the RTC that working limits had been established before entering the roadway.

Section 5.10.2 of the Metrorail Safety Rules and Procedures Handbook (MSRPH) requires a RWIC to receive permission from the ROCC before entering the roadway. Authority to enter the roadway is not considered in effect until the RWIC requests authority and the RTC has established and confirmed such protections.

<< continues on next page >>

For questions regarding this Safety Bulletin or other safety-related issues, contact the Safety Hotline at 202-249-SAFE (7233).

M metro SAFE Department of Safety

PDC Authorizations
While utilizing a third rail power outage in conjunction with ETO or IT, notification from the PDC to hot stick **does not** mean the roadway worker has permission to access the roadway. While RWP and third rail power outages are closely related and are often used together, authorization to enter the roadway may only come from the RTC.

Interim Mitigation
When a PDC verbally notifies the RWIC to perform hot sticking activities, they shall emphasize that the notification to hot stick **does not authorize roadway entry** until the RWIC ensures that the RTC has established their working limits.

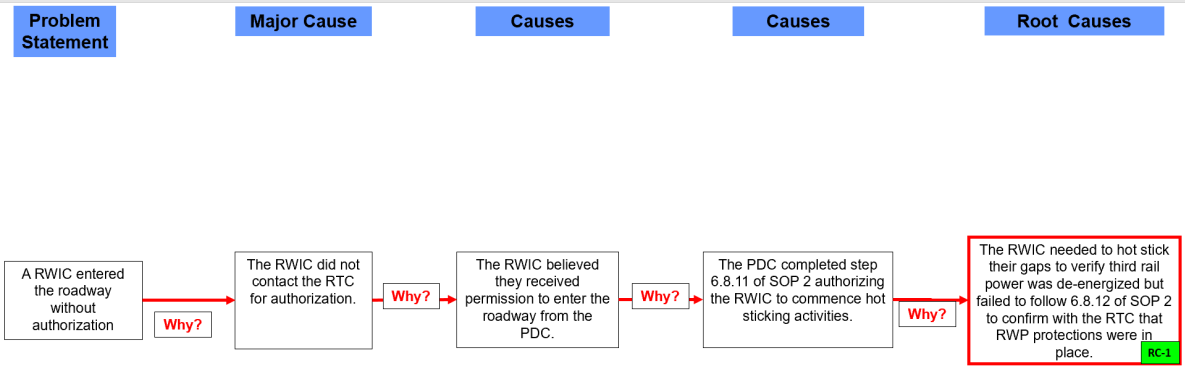
Resources
All RWP rules and procedures can be found in Section 5 of the MSRPH. Additionally, detailed procedures related to ETO and Third Rail Power and De-energization can be found in the following SOPs, which can also be found on MetroDocs:

- SOP 410-ROCC-ROC-04-00: Roadway Worker Protection – Exclusive Track Occupancy
- SOP 2: Third Rail Power Energization and De-energization Procedures

For questions regarding this Safety Bulletin or other safety-related issues, contact the Safety Hotline at 202-249-SAFE (7233).

metro SAFE Department of Safety

Appendix F – Why Tree



Root Cause Analysis