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WMSC Commissioner Brief: W-0085 – Improper Roadway Worker Protection – Fort Totten Station – December 12, 2020

Prepared for Washington Metrorail Safety Commission meeting on June 29, 2021

Safety event summary:

Just before a shift turnover in the Rail Operations Control Center (ROCC), a rail controller granted Foul Time protection to a Traction Power Maintenance (TRPM) crew that had just completed overnight work near Fort Totten Station and therefore needed to move to a different area to restore power ahead of the opening of the system for Saturday morning's revenue service. Foul Time protection is meant to ensure that no rail vehicle moves through the work area while the work crew is on the roadway. However, while the work crew was still on the roadway, a different rail controller who had taken over the desk gave permission to the equipment operator of a maintenance vehicle (prime mover) to move through the area where the work crew had foul time protection on the Green and Yellow Line tracks.

The controller apparently did not fully process the turnover, and removed all documented protections for the work crew on the roadway in the AIM system. The improper vehicle routing process began approximately 8 minutes prior to the vehicle entering the connector tracks, beginning prior to communications with the prime mover operator due to instructions from ROCC management, but the improper routing was not identified until the prime mover approached the work crew.

The work crew fled the roadway from the interlocking when they saw the Prime Mover's lights moving toward them, and entered the Tie-Breaker Station room. The equipment operator stopped the Prime Mover and checked with the work crew.

Probable Cause:

The probable cause of this event was a lack of situational awareness, a lack of attention to the indicators of personnel under foul time protection, and insufficient procedures to ensure controllers are fully aware of the status of the roadway in their area of responsibility when starting a shift.

Corrective Actions:

ROCC re-trained the rail controller who incorrectly provided the absolute block to a prime mover through a work zone.

ROCC developed and distributed a lessons learned document based on this and other instances of improper roadway worker protection.

ROCC management issued a memorandum instructing incoming controllers to establish radio communications with any personnel under Foul Time,

WMSC staff observations:

This event highlights the importance of training and ongoing operational oversight to ensuring safety. Metrorail may also consider specific processes to ensure that incoming controllers review all aspects of their territory and maintain full situational awareness.

Metrorail established staggered shifts (prior to the public health emergency) with controllers assigned to shifts starting on the hour or on the half hour without fully factoring in the number of controllers available during each part of that overlap given various controllers' assigned days off. This has created complex turnovers for some consoles in cases such as ongoing incidents.

Staff recommendation: Adopt final report.

Washington Metro Area Transit Authority

Department of Safety and Environmental Management (SAFE)

FINAL REPORT OF INVESTIGATION A&I E20487

Date of Event:	12/12/2020
Type of Event:	Improper Roadway Worker Protection
Incident Time:	05:33 hrs.
Location:	Fort Totten Station
Time and How received by SAFE:	05:43 hrs. Safe On-call Phone
WMSC Notification Time:	06:28 hrs.
Responding Safety Officers:	WMATA SAFE: No WMSC: No Other: N/A
Rail Vehicle:	None
Injuries:	None
Damage:	None
Emergency Responders:	N/A
SMS I/A	20201212#90730

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Abbreviations and Acronyms

AIMS	Advanced Information Management System
ARS	Audio Recording Service
CM	Chain Marker
MOC	Maintenance Operations Center
MSRPH	Metrorail Safety Rules and Procedures Handbook
NOAA	National Oceanic and Atmospheric Administration
PM	Prime Mover
ROCC	Rail Operations Control Center
RTC	Rail Traffic Controller
RTRA	Office of Rail Transportation
RWIC	Roadway Worker in Charge
SAFE	Department of Safety and Environmental Management
SMS I/A	Safety Measurement System Incidents/Accidents
TRPM	Traction Power Maintenance Department

Executive Summary

On Saturday, December 12, 2020, at approximately 04:33 hrs., the Roadway Worker in Charge (RWIC) of a Traction Power Maintenance Department (TRPM) crew located at Fort Totten Station contacted the Rail Operations Control Center (ROCC) midnight shift Radio Rail Traffic Controller (RTC) that they had turned in a red tag and released the work area where they were located on Track 1. The RWIC also requested to utilize Foul Time (FT) protection between Fort Totten Station Platform and Chain Marker (CM) E1 276+00 to close third rail breakers located in the E06 Tie Breaker Station (TBS) located at CM E1 276+00. The midnight shift Radio RTC instructed the RWIC to stand by for FT. At approximately 04:55 hrs., the Midnight shift Radio RTC contacted the RWIC and granted them FT providing red aspects at E05-02 signal and E06-62 signal; the RWIC was instructed to notify ROCC when all personnel were safely on the platform and clear of the roadway. At 05:06 hrs., during the required shift turn over, the midnight shift Radio RTC was relieved by a dayshift Radio RTC; the day shift Radio RTC was notified of personnel utilizing FT at Fort Totten Station Interlocking. At approximately 05:18 hrs., the day shift Radio RTC was relieved by an additional Radio RTC at 05:21 hrs., the midnight shift Radio RTC again during the required shift turn over notified the incoming additional Radio RTC that personnel were utilizing FT, which included Blue Block, Human Form and Prohibit exits at Fort Totten Station Interlocking.

At approximately 05:31 hrs., Prime Mover (PM) 41 standing by E06-62 signal contacted the additional Radio RTC requesting an absolute block to Greenbelt Yard for storage. The additional Radio RTC gave PM-41 an absolute block to College Park Station, verifying lunars at E06-62 signal and E06-02 signal. At 05:33 hrs., the RWIC of the TRPM crew contacted the additional Radio RTC to ascertain if they had instructed PM-41 to traverse their work location while they were on the roadway. The additional Radio RTC stated that they did not have a work area set up at that location. The additional Radio RTC asked for the precise location of the TRPM crew; the RWIC stated that they had cleared to the room in the TBS when they saw the lights of PM-41. The additional Radio RTC stated that they were not aware that personnel were on the roadway. The additional Radio RTC instructed PM-41 to stop their Unit. The RWIC reiterated that personnel were under FT to close breakers located at the TBS. The additional Radio RTC requested TRPM RWIC to relinquish their FT protection and granted PM-41 an absolute block to College Park Station.

Subsequently, the additional Radio RTC was removed from service and transported for post-incident testing. There were no injuries as a result of this incident.

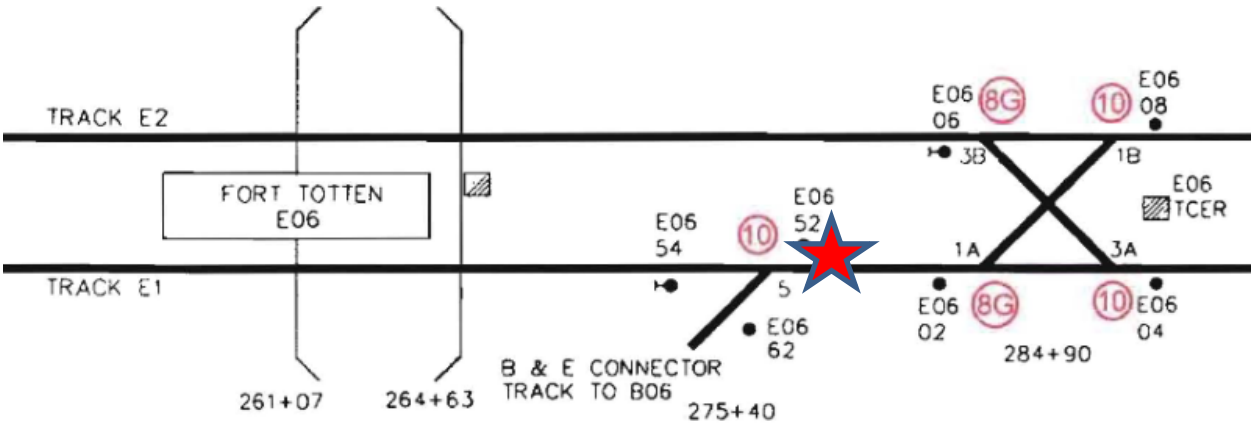
The probable cause of the Improper Roadway Worker Protection event at Fort Totten Station on December 12, 2020, was the additional Radio RTC failure to properly acknowledge the midnight shift RTC turnover, which included the FT protection, FT checklist, Blue Block, Human Form and Prohibit exits established for the TRPM work crew at the E06 TBS. The additional RTC was not in compliance with written rules and procedures regarding FT protection per Metrorail Safety Rules and Procedures Handbook (MSRPH) Roadway Worker Protection, Section 5.13.2, which requires no train movement in an area protected by FT.

PROTECTION COORDINATION	IT	ETO	AMF	FT
Personal Protective Equipment	R	R	R	R
Roadway Job Safety Briefing	R	R	R	R
Blue Block Traffic/Human Form	R	R	R	AR
Red Signals	R	R	NA	AR
Hot Stick/ Voltage Awareness Device	R	AR	NA	AR
Prohibit Exit	R	AR	NA	AR
ROCC Notification	R	R	R	R
Announcements	AR	AR	NA	AR
Adjacent Track Speed Restriction	AR	AR	AR	NA
Stop Train Movement	R	AR	AR	R
General Orders/Tracking Rights System (GOTRS) Work Limits	R	AR	NA	NA
Verify Shunt	R	AR	NA	NA
Warning Strobe and Alarm Device	R	AR	NA	NA
Physical Barrier	R	NA	NA	NA

Incident Site

Fort Totten Station, Track 1, CM E1 276+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 Process and Methods

Upon receiving notification of the Improper Roadway Worker Protection at Fort Totten Station on December 12, 2020, SAFE dispatched a cross-functional team to assess the scene and conduct the subsequent investigation. SAFE team members worked with relevant WMATA subject matter experts to review the incident's facts and data.

Investigation Methods

The investigative methodologies included the following:

- Physical Site Assessment.

- Formal Interviews – SAFE interviewed one individual as part of this investigation. Interviews will include persons present during and after the incident, those directly involved in the response process. SAFE interviewed the following individuals:
    - Additional Radio RTC

- Informal Interviews – Collected through conversations with individuals during the course of the investigation to provide background and supporting information.

- Documentation Review – A Collection of relevant work history information and process documentation contained in Metro systems of record. These records include:
    - Employee Training Procedures & Records
    - Certifications
    - The 30-Day work history review
    - Metrorail Safety Rules and Procedures Handbook (MSRPH)
    - National Oceanic Atmospheric Administration (NOAA) data review

- System Data Recording Review – Collection of information contained in Metro Data Recording Systems. This data includes:
    - Audio Recording System (ARS) playback (Radio and Phone Communications)
    - Advanced Information Management System (AIMS)

Investigation

On Saturday, December 12, 2020, at approximately 04:33 hrs., the RWIC of a TRPM crew located on the roadway at Fort Totten Station, track 1, contacted the midnight Radio RTC and reported that all personnel had completed their work on the roadway and returned a red tag to the Maintenance Operations Center (MOC). Additionally, the RWIC requested FT protection between CM E1 276+00 and Fort Totten Station to enter the E06-TBS to close the breakers associated with the red tag. The midnight shift Radio RTC instructed the RWIC to stand by for FT protection. At approximately 04:55 hrs., the midnight shift Radio RTC contacted the RWIC and granted them FT protection with red aspects at E05-02 signal and E06-62 signal. At 05:06 hrs., the midnight shift Radio RTC was relived by a dayshift Radio RTC; the day shift Radio RTC was notified during the required shift turn over of personnel utilizing FT at Fort Totten Station Interlocking. At approximately 05:18 hrs., the day shift Radio RTC was relieved by an additional Radio RTC at 05:21 hrs., the midnight shift Radio RTC again during the required shift turn over notified the

additional Radio RTC that personnel were utilizing FT, which included Blue Block, Human Form and Prohibit exits at Fort Totten Station interlocking.

At approximately 05:31 hrs., PM-41, a transport unit from a prior work location, contacted the additional Radio RTC and reported that they were standing by E06-62 signal requesting an absolute block to Greenbelt Yard for storage. The additional Radio RTC gave PM-41 an absolute block to College Park Station, verifying lunar aspects at E06-62 signal and E06-02 signal. At 05:33 hrs., the RWIC of the TRPM crew contacted the additional Radio RTC to asked if they had instructed PM-41 to traverse their work location while personnel were on the roadway. The additional Radio RTC stated that they did not have a work location in that area. The additional Radio RTC verified the precise location of the personnel on the roadway; the RWIC stated that they had cleared to the room in the TBS located at CM E1 276+00. The RWIC stated personnel cleared to the room in the TBS when they observed the lights for PM-41.

The additional Radio RTC stated that they were not aware that personnel were on the roadway. The additional Radio RTC instructed PM-41 to stop their Unit and requested their location. PM-41 reported that they were in Fort Totten Station Interlocking and had stopped their Unit when they observed personnel in the roadway. The RWIC reiterated that personnel were under FT protection to close breakers located in the TBS. The additional Radio RTC requested TRPM personnel to relinquish FT protection and granted PM-41 an absolute block to College Park Station. The RWIC and work crew remained inside the TBS and later requested FT protection to return to the Fort Totten Station platform, the Radio RTC, after establishing the Blue Block, Human form and prohibit exits, granted permission to the RWIC to access the roadway under FT and the RWIC subsequently cleared the roadway and relinquished their FT.

Chronological ARS Timeline

SAFE investigations from the ARS include OPS 3.

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

Time	Description
04:33:18 hrs.	The RWIC of a TRPM crew contacted the Radio RTC to report that they turned in their red tag to MOC and requested FT protection to close third rail breakers located in the TBS. The Radio RTC instructed personnel to stand by for permission. [Radio]
04:55:26 hrs.	The Radio RTC gave the RWIC FT protection between CM E1 276+00 and Fort Totten Station. [Radio]
05:06:04 hrs.	Incoming RTC relieved the outgoing RTC; personnel under FT included in the turnover process. [Ambient]
05:10:45 hrs.	A different RTC arrives to relieve the current Radio RTC. Personnel utilizing FT mentioned in the turnover process. [Ambient]
05:31:10 hrs.	PM-41 contacted the Radio RTC and notified them that they were standing by E06-62 signal and requested an absolute block to Greenbelt Yard for storage. [Radio]
05:32:22 hrs.	The Radio RTC gave PM-41 an absolute block to College Park Station. [Radio]
05:33:07 hrs.	The RWIC contacted the Radio RTC and asked if they allowed a Unit to traverse their work location. [Radio]
05:34:54 hrs.	PM-41 notified the Radio RTC that they were stopped in the Interlocking and stopped their Unit when they observed personnel on the roadway. [Radio]

05:36:15 hrs.	The RWIC relinquished FT protection and remained inside the TBS. The Radio RTC gave PM-41 an absolute block to College Park Station. [Radio]
05:48:45 hrs.	The RWIC requested FT protection to enter the roadway at CM E1-275+75 to return to the Fort Totten Station platform.
05:49:11 hrs.	The Radio RTC acknowledged the RWIC's request and instructed them to stand by stand clear.
05:52:16 hrs.	The Radio RTC contacted the RWIC and proceeded to call out the prohibit exits.
05:52:37 hrs.	The Radio RTC established the FT protection and granted permission to the RWIC to access the roadway and requested to be informed was the RWIC clear to the platform.
05:52:57 hrs.	The RWIC acknowledged the Radio RTC instructions.
06:03:00 hrs.	The RWIC contacted the Radio RTC and relinquished their FT at the Fort Totten Station platform.
06:03:08 hrs	The Radio TRC acknowledged the RWIC and gave them a clear time of 06:03 hrs.

Advanced Information Management System (AIMS)

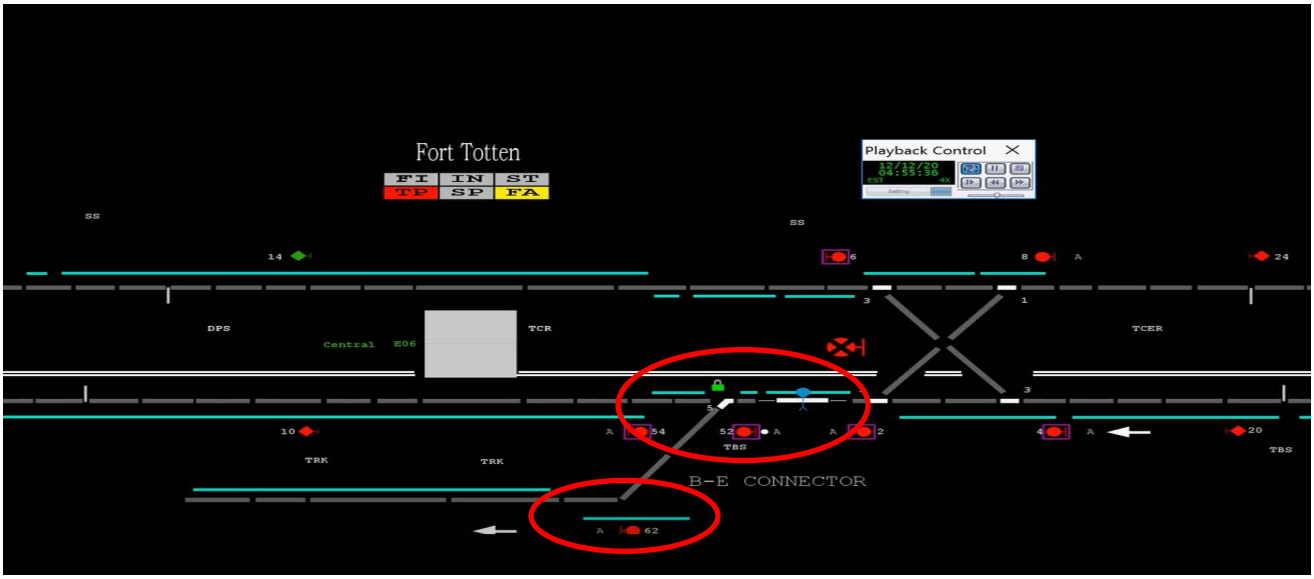


Photo 1: FT protection established at Fort Totten Station displaying E06-62 signal red and E06-52 signal prohibited (red aspect).

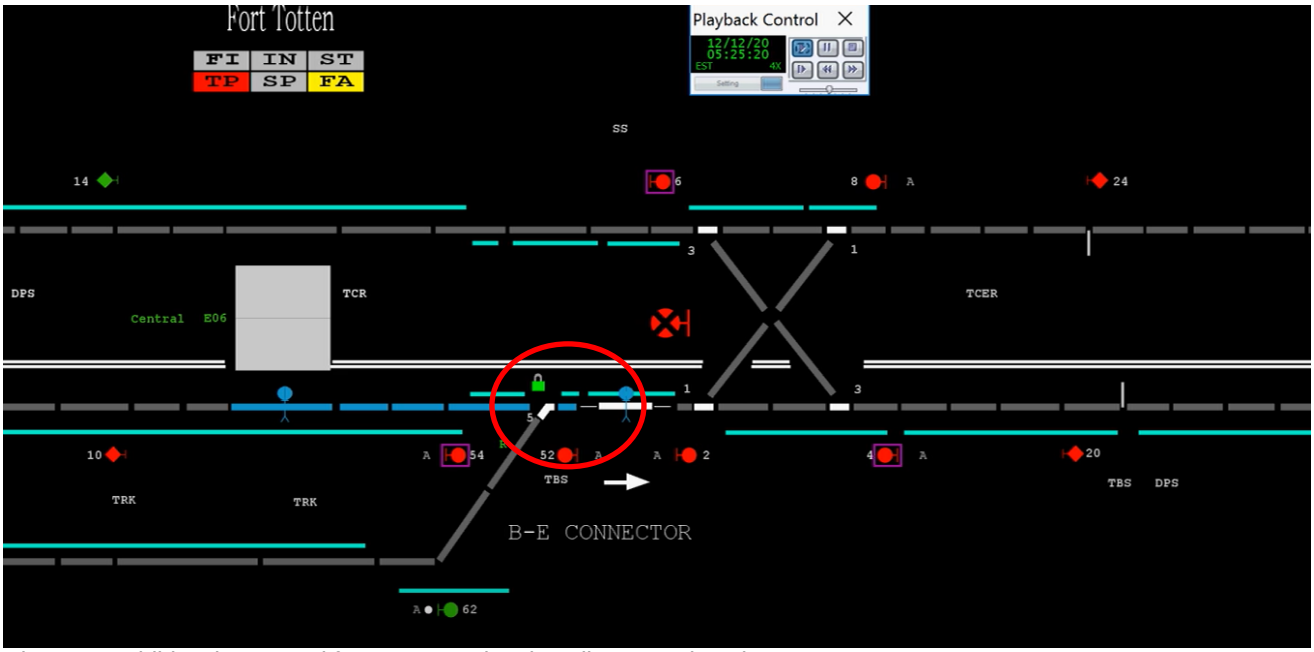


Photo 2: Prohibit exit removed from E06-52 signal to allow entry into the FT area.

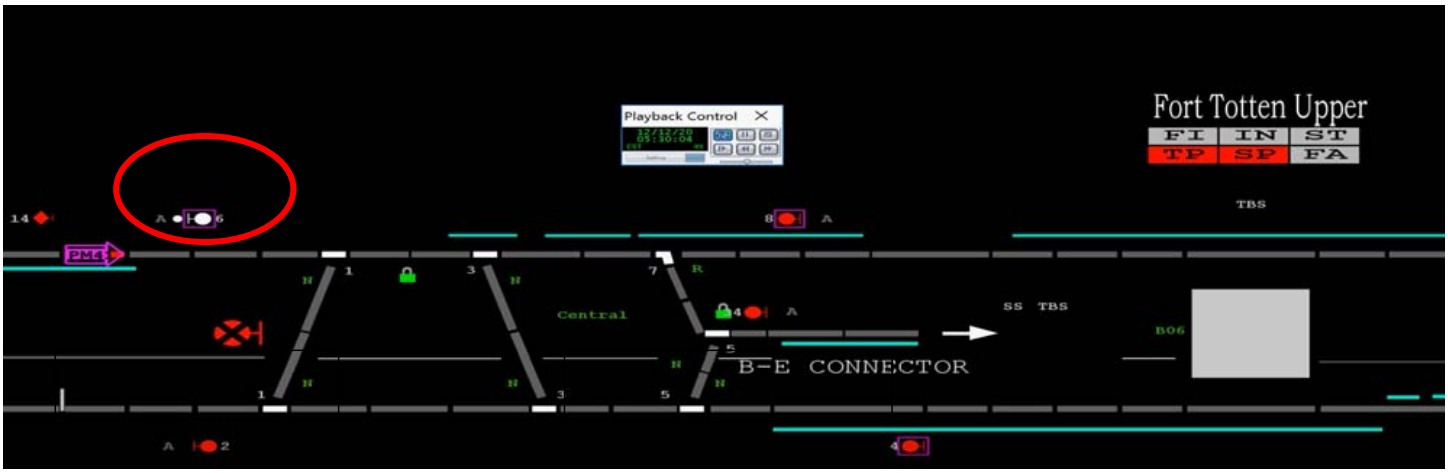


Photo 3: Lunar set at B06-06 signal to allow PM-41 to enter the connector track.

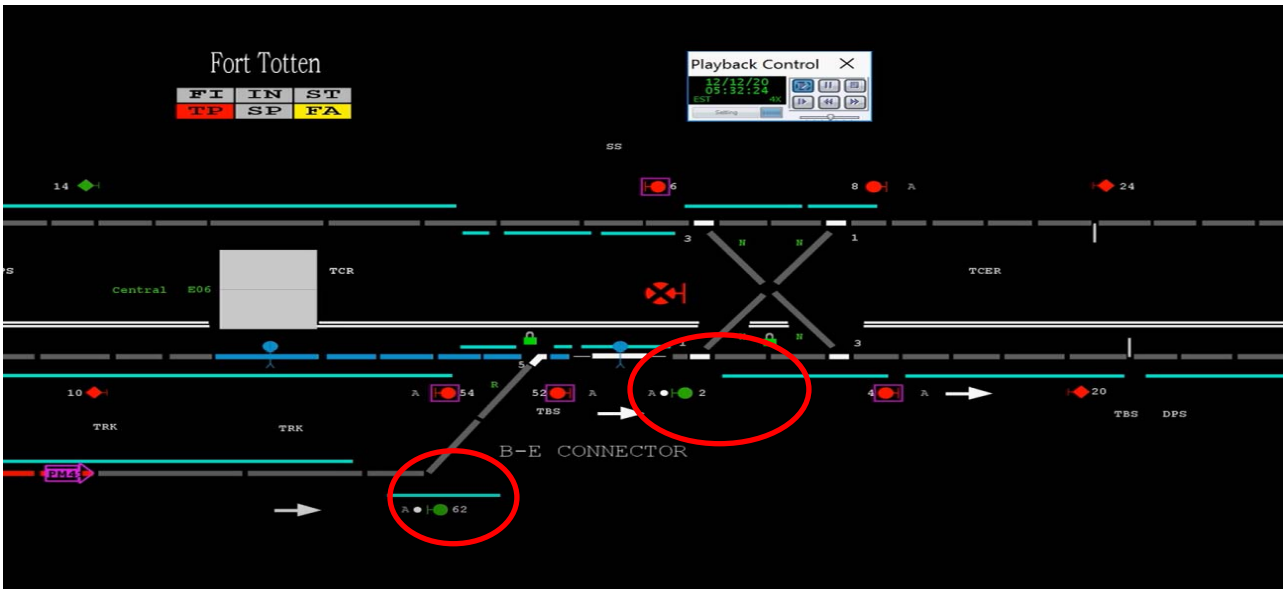


Photo 4: Lunar set at B06-06 signal to allow PM-41 to enter the connector track.

Findings

- FT was established during the midnight shift.
- A total of three different Radio RTCs were responsible for the area while under FT protection.
- Personnel under FT protection was discussed during each turnover.

Weather

At the time of the incident, NOAA recorded the temperature at 41° F and clear. SAFE has concluded that weather was not a contributing factor in this incident (Weather source: NOAA) – Location: Washington, DC.)

Human Factors

Fatigue

Based on SAFE interview question related to Fatigue Factors and a review of the Radio RTC's 30-day work history, SAFE determined, the employee's hours of service were in accordance with WMATA's *Fatigue Risk Management Policy 10.6/1* and *Hours of Service Limitations for Prevention of Fatigue Policy 10.6/1* and discounted Fatigue as a contributing factor for this event.

Post-Incident Toxicology Testing

After reviewing all employee post-incident testing results, SAFE determined that the Radio RTC (Additional) involved were not violating the Drug and Alcohol Policy and Testing Program 7.7. 3/5, therefore, being under the influence of a controlled substance has been excluded as a contributing factor.

Probable Cause Statement

The probable cause of the Improper Roadway Worker Protection event at Fort Totten Station on December 12, 2020, was the additional Radio RTC failure to properly acknowledge the midnight shift RTC turnover, which included the FT protection, FT checklist, Blue Block, Human Form and Prohibit exits established for the TRPM work crew at the E06 TBS. The additional RTC was not in compliance with written rules and procedures regarding FT protection per Metrorail Safety Rules and Procedures Handbook (MSRPH) Roadway Worker Protection, Section 5.13.2, which requires no train movement in an area protected by FT.

SAFE Recommendations

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. Refer to the SMS I/A module for additional information.

Corrective Action Code	Description
90730_SAFECAPS_ ROCC_001	Provide the additional Radio RTC re-training, emphasizing Roadway Worker Protection rules and procedures.
90730_SAFECAPS_ ROCC_002	Provide lessons learned to discuss the event and findings to include previous Improper Roadway Worker Protection involving ROCC personnel.
90730_SAFECAPS_ ROCC_003	Issue a memorandum instructing incoming RTC's to establish radio communications with any personnel under FT protection after turnover.

Appendix A - Interview Summaries

Rail Operations Control Center (ROCC)

Radio Rail Traffic Controller (Additional Radio RTC)

The Radio RTC is a WMATA employee with three years of experience as a Rail Traffic Controller and 13 years of service in various positions as Bus Operator, BTRA Supervisor, and RTRA Supervisor.

Based on the SAFE interview, the Radio RTC stated that they were due to assume duties as the Radio RTC at 05:30; the Radio RTC stated they arrived at ROCC at 05:15 hrs., to clean off the work station on the console prior to formally taking over the duties of the Radio RTC. The Radio RTC reported that another Radio RTC was already positioned on the console, and they were not assigned to the console but were instructed to remain as the Radio RTC on OPS 3 due to the staggered policy as a result of COVID-19 protocol; which requires RTC's to exit the Control Center 30 minutes earlier than assigned to prevent personnel from contacting each other. The Radio

RTC stated that the off-going RTC attempted to conduct a turnover and the Radio RTC stated that they were not there to assume the console at that time.

The Radio RTC assumed the Radio console on OPS 3 and stated that part of their turnover included a sheet of paper with third rail breakers written on the paper and the RTC notified them that there were TRPM personnel in the room utilizing FT protection. The Radio RTC reported that after receiving the turnover, they began to fill out their third rail breaker sheets to prepare the mainline for revenue service. The Radio RTC reported that they were receiving multiple phone calls from the MOC Supervisor on the power desk requesting the expedition of restoring third rail power due to an incident at Fort Totten Station. The Radio RTC reported they received a phone call from the Button RTC on the Red line console to inform them that PM-41 would be traveling thru the B+E Connector track for storage in Greenbelt Yard. The Radio RTC reported that they set E06-62 signal prior to communicating with the PM Unit due to instruction from ROCC management to set the lead in the connector track to prevent red signal overruns. The Radio RTC stated that after they set E06-62 they continued to complete the third rail breaker sheet. The Radio RTC reported that PM-41 contacted them on the radio requesting permission to enter the mainline; the Radio RTC proceeded to provide the PM Unit an absolute block to College Park Station. The Radio RTC reported that while PM-41 traversed Fort Totten Station interlocking, they reported that they observed a crew in the interlocking; the TRPM crew that was utilizing FT also contacted the Radio RTC and reported that they were under FT closing third rail breakers. The Radio RTC stated that they were under the impression that TRPM personnel were safely in the room closing third rail breakers and not on the roadway. The Radio RTC stated that they stopped the PM Unit and ascertained if there were any injuries. Upon receiving information that all personnel were clear, the Radio RTC reported that the Assistant Superintendent instructed them to have TRPM relinquish FT in order to have PM-41 continue to Greenbelt Yard.