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WMSC Commissioner Brief: W-0099 – Improper Roadway Worker Protection - Takoma Station - Jan. 18, 2021

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

Revised for meeting on December 7, 2021

Safety event summary:

An Advance Mobile Flagger (AMF) assigned to warn Red Line trains of track inspectors on Track 2 between Takoma Station and Fort Totten Station instead positioned themself at the wrong end of the Takoma Station platform to speak to train operators moving toward Silver Spring Station.

Prior to the track inspectors entering the roadway at Fort Totten Station, the Roadway Worker In-Charge (RWIC) had reported to the Rail Operations Control Center (ROCC) controller that the AMF was in place at Takoma Station. This was based on the AMF confirming to the RWIC that they were in position as required at Takoma Station, Track 2. Data gathered during the investigation also demonstrates that the AMF had informed the RWIC that they were in position while the AMF was still on a train approaching Takoma Station. This was one of two AMF's being used for this inspection, with the intent of reducing the time inspectors spent waiting on a preceding station platform. This AMF had served as the AMF on the Brookland Station platform for the first part of the inspection from Rhode Island Ave. And Brookland stations. The inspectors then walked under the protection of another AMF from Brookland Station to Fort Totten Station, with this AMF expected to be in position at Takoma Station for the walk from Fort Totten Station to Takoma Station. In an interview, this AMF said they did not depart Fort Totten Station until the inspectors had arrived at the station.

CCTV video reviewed for this investigation shows the AMF was positioned at Takoma Station, Track 1, which would have meant warning trains moving away from the track inspectors.

When a train departed the Takoma Station platform toward the work crew, the AMF did not communicate to the RWIC, the Train Operator, or the ROCC that a train was approaching a work crew without the required protection.

The Train Operator of Train 106 who had departed toward Fort Totten Station passed the personnel on the roadway and then stopped their train.

In an interview, the RWIC stated that they saw the train approaching while the inspectors were on the roadway, and the inspectors moved to a place of safety.

The Train Operator then requested over the radio that the ROCC notify the track inspectors that the train was departing Takoma Station. The ROCC controller contacted the RWIC regarding the AMF who was supposed to be on the platform. The Train Operator reported to the ROCC that they did not see an AMF in place at Takoma Station, Track 2. The track inspectors were instructed to move to a place of safety and were picked up by the next train.

Probable Cause:

The probable cause of this event was Metrorail's lack of safety assurance and supervisory oversight to ensure that safety-critical procedures are followed, and inadequate physical characteristics training that is necessary to provide for full situational awareness.

Corrective Actions:

This and other improper roadway protection events involving an AMF will be incorporated into training on use of an AMF and performance of AMF duty.

AMF training will include physical characteristics training related to track orientation, and training regarding stopping work or train movement if an AMF think they are disoriented.

Metrorail will perform AMF site performance assessments and document evaluations.

The AMF was re-trained.

WMSC staff observations:

This event is one of several that the WMSC has observed that suggest there may be insufficient physical characteristics training for at least some Metrorail personnel to properly understand and identify critical elements of territory that they work on or may work on. This includes training for contractors Metrorail is now using as AMFs who may not be experienced in the WMATA Rail System. The WMSC is further assessing this issue through ongoing inspection and audit work.

The WMSC is also examining whether there may be an increased likelihood of improper roadway worker protection among work crews that utilize multiple AMFs rather than a single AMF.

WMATA is in the process of a roadway worker protection rules overhaul, including changes to forms of protection and processes. Extensive training for personnel will be required prior to implementation of this update.

This event also demonstrates the importance of fully utilizing all available data as required by the safety management system (SMS) approach embodied in WMATA's Public Transportation Agency Safety Plan (PTASP). Ongoing access to and review of CCTV video and other information can provide for improved supervisory oversight and monitoring, and can provide another layer of protection to identify safety issues like this one before the hazards result in consequences such as collision or injury.

Staff recommendation: Adopt final report.

Washington Metro Area Transit Authority

Department of Safety and Environmental Management (SAFE)

FINAL REPORT OF INVESTIGATION A&I E21018

Date of Event:	1/18/2021
Type of Event:	Improper Roadway Worker Protection
Incident Time:	10:36 hrs.
Location:	Takoma Station
Time and How received by SAFE:	11:06 hrs. Safe On-call Phone.
WMSC Notification Time:	12:43 hrs.
Responding Safety Officers:	WMATA SAFE: No WMSC: No Other: N/A
Rail Vehicle:	None
Injuries:	None
Damage:	None
Emergency Responders:	N/A

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Abbreviations and Acronyms

AMF	Advanced Mobile Flagger
ARS	Audio Recording Service
CCTV	Closed Circuit Television
CM	Chain Marker
ERT	Emergency Response Team
MSRPH	Metrorail Safety Rules and Procedures Handbook
NOAA	National Oceanic Atmospheric Administration
RJSB	Roadway Job Safety Brief
ROCC	Rail Operations Control Center
RTC	Rail Traffic Controller
RWIC	Roadway Worker in Charge
RWP	Roadway Worker Protection
SAFE	Department of Safety and Environmental Management
SMS I/A	Safety Measurement System Incidents/Accidents
TRST	Track and Structures

Executive Summary

On Monday, January 18, 2021, Track and Structures (TRST) personnel were performing a scheduled track inspection utilizing Advanced Mobile Flagger (AMF) protection. At approximately 10:35 hrs., the TRST personnel arrived at Fort Totten Station (Upper Level), Track 2. The Roadway Worker in Charge (RWIC) contacted the Radio Rail Traffic Controller (RTC) and requested permission to continue their track inspection from Fort Totten Station to Takoma Station, Track 2. The RWIC reported that their AMF was in place at Takoma Station; the Radio RTC instructed the RWIC to go direct to the AMF and confirm that the AMF was in position for flagging duties. The AMF confirmed with the RWIC on the radio that they were in position Takoma Station, Track 2.

The Radio RTC granted permission for the RWIC to continue their track inspection and instructed the RWIC to notify them when they change locations and clear the roadway. At approximately 10:39 hrs., revenue Train ID 106 Train Operator contacted the Radio RTC and reported passing TRST personnel on the roadway and that they did not see an AMF standing by the 8-car marker at Takoma Station, Track 2, after servicing the station. The Radio RTC requested the exact location of the TRST personnel on the roadway; the RWIC reported that personnel were standing by Chain Marker (CM) B2 297+00. The Radio RTC instructed the RWIC and all personnel to stand by in a place of safety in preparation for train pick up. The Radio RTC instructed Train ID 107 Train Operator to pick up TRST personnel at CM B2 297+00. At 10:44 hrs., the Train ID 107 Train Operator reported to the Radio RTC that they safely picked up personnel from the roadway. At 10:46 hrs., the Button RTC notified the Rail Operations Control Center (ROCC) Assistant Superintendent of the improper RWP.

The ROCC Assistant Superintendent notified the Department of Safety and Environmental Management (SAFE) of the improper RWP. The ROCC removed the AMF and associated personnel from service. TRST management transported the personnel for post-incident toxicology testing. No injuries were reported as a result of this event.

SAFE's investigative findings determined, the AMF reported that they were at Takoma Station platform Track 2 in position for flagging duties when they were standing by on the opposite side of the platform without providing the appropriate protection in association with the form of roadway protection.

The probable cause of the Improper Roadway Worker Protection (RWP) event was that the AMF positioned themselves on the wrong side of the platform. A contributing factor was the human performance difficulties experienced by the Advanced Mobile Flagger (AMF) when they informed the RWIC that they were in position, however they were not. Based on the AIMS Playback and radio communications timelines the AMF was still on board train ID 109 and not positioned at the 8-car marker as required. Upon arriving at Takoma Station the AMF lost their situational awareness, causing their failure to position themselves at the proper 8-car marker in the direction the Mobile Work Crew would be travelling. The AMF not being positioned at the 8-car marker allowed one train to pass by the Mobile Work Crew, subsequently resulting in the Improper

Roadway Worker Protection event. The AMF was not in compliance with Metrorail Safety Rules and Procedures Handbook (MSRPH) Train Roadway Worker Protection, section 5.13.6, "*Under the direction of the RWIC, the AMF will position themselves at the next station ahead (in the direction the mobile crew will be walking*). *The AMF will take their position at the end of the platform (8 car marker or end gate area) in the direction the train is traveling, and on the mobile crew is inspecting.*

Incident Site

Takoma Station

Field Sketch/Schematics

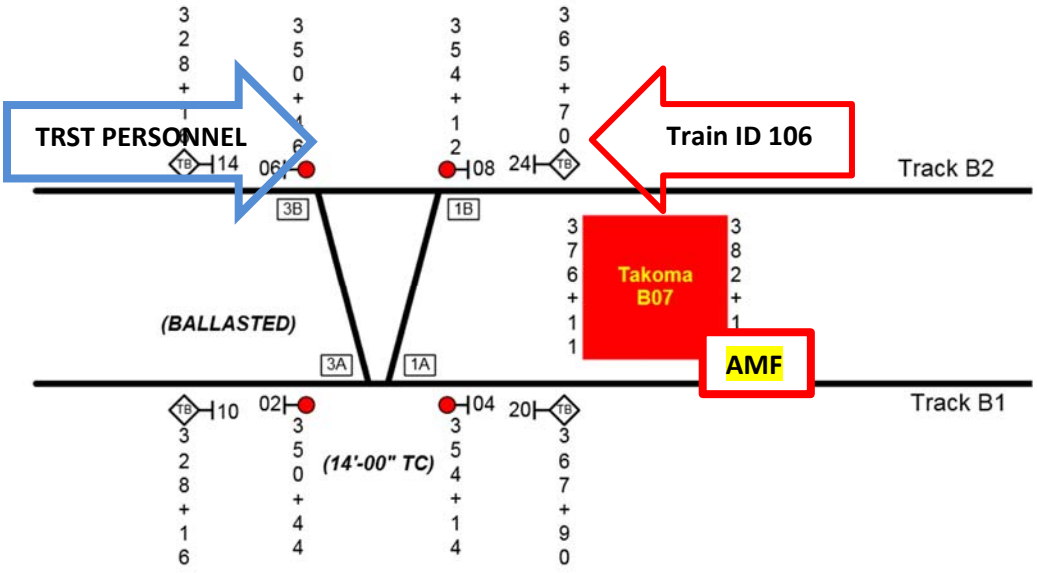

Figure 1 - Takoma Station (does not indicate the exact location of TRST personnel or Train ID 106).

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 Takoma Station on January 18, 2021, 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 facts and data associated with the incident.

Investigation Methods

The investigative methodologies included the following:

- Site Assessment

- Formal Interviews – Two individuals were interviewed as part of this investigation. Interviews will include persons directly involved in the event. The following individuals will be interviewed:
    - TRST RWIC
    - AMF

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

- Documentation Review – Collection of relevant work history information and process documentation contained in Metro systems of record. These records include:
    - Employee Training Procedures & Records
    - Certifications
    - 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)

Investigation

On Monday, January 18, 2021, the RWIC of a Track and Structures (TRST) mobile work crew contacted ROCC and requested permission to perform a scheduled track inspection from Rhode Island Avenue Station (B04) to Silver Spring Station (B08) utilizing Advanced Mobile Flagger (AMF) protection. The Radio RTC granted permission to the RWIC to perform their inspection and to notify them when they change locations and or clear the roadway. At approximately 10:35 hrs., the RWIC arrived at Fort Totten Station, Track 2. The RWIC contacted the Radio RTC and requested permission to continue their track inspection from Fort Totten Station to Takoma Station, Track 2. The RWIC reported that their AMF was in place at Takoma Station; the Radio RTC instructed the RWIC to go direct to the AMF and confirm that the AMF was in position for flagging duties.

The AMF confirmed with the RWIC on the radio that they were in position Takoma Station, Track 2. At 10:36 hrs., the Radio RTC granted permission for the RWIC to continue their track inspection and instructed the RWIC to notify them when they change locations and clear the roadway. At approximately 10:39 hrs., revenue Train ID 106 Train Operator contacted the Radio RTC and requested that the Radio RTC notify personnel on the roadway that they were departing Takoma Station, Track 2. The Radio RTC contacted the RWIC to ascertain the status of their AMF; the RWIC reported that the AMF was on the platform at Takoma Station, Track 2, Train ID 106 reported that they did not see an AMF standing by the 8-car marker at Takoma Station, Track 2 after they serviced the station.

The Radio RTC requested the exact roadway location of the TRST mobile work crew; the RWIC reported that personnel were standing by CM B2 297+00. The Radio RTC instructed the RWIC and all personnel to stand by in a place of safety in preparation for train pick up. The Radio RTC instructed Train ID 107 Train Operator to pick up TRST personnel at CM B2 297+00. At 10:44 hrs., the Train ID 107 Train Operator reported to the Radio RTC that they safely picked up personnel from the roadway. At 10:46 hrs., the Button RTC notified the Rail Operations Control Center (ROCC) Assistant Superintendent of the Improper Roadway Worker Protection.

Chronological Timeline of Events

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

Time	Details
10:35:33 hrs.	RWIC contacted the Radio RTC to request to continue their track inspection from Fort Totten Station to Takoma Station, Track 2. Radio RTC instructed the RWIC to establish communications with the AMF at Takoma Station. [Radio]
10:35:57 hrs.	RWIC and AMF established radio communications; AMF stated that they were standing by Takoma Station, Track 2, for flagging duties. [Radio]
10:36:00 hrs.	Radio RTC granted permission to the RWIC to continue their track inspection under AMF protection. [Radio]
10:39:32 hrs.	Train ID 106 requested the Radio RTC notify personnel in the roadway that they were departing Takoma Station. [Radio]
10:40:01 hrs.	The Radio RTC contacted the RWIC to ascertain the status of the AMF. The RWIC stated that the AMF was on the platform at Takoma. [Radio]
10:40:25 hrs.	Train ID 106 Operator reported that they did not speak with an AMF. [Radio]
10:44:51 hrs.	The Radio RTC contacted the RWIC and instructed the RWIC to provide a CM to get picked up by Train ID 107. [Radio]
10:46:25 hrs.	The Button RTC notified the Assistant Superintendent to report the improper RWP. [Phone]

SAFE investigations from the ARS include OPS 1, Button RTC Phone Communications, and ROCC Assistant Superintendent Phone Communications.

Interview Findings

Based on the investigation launched into the Improper Roadway Worker Protection, SAFE conducted two virtual interviews, including the investigation team and relevant Metro management. These interviews were conducted over one week after the event and identified the following key findings.

At the time of the incident, the RWIC utilized 2 AMF personnel to complete their track walk more efficiently. The RWIC was under the assumption that the AMF was on location at Takoma after radio confirmation.

Findings

- The AMF reported that they were standing by the 8-car marker at Takoma Station, however, the AMF was on the revenue Train ID 109 in approach to Takoma Station.
- AMF was standing by the 8-car marker on Track 1 instead of the 8-car marker on Track 2.
- When the AMF realized they were standing by on Track 1 they observed Train ID 106 departing Track 2 and did not make an attempt to notify the RWIC and report that they did not talk to the Train Operator as the train departed the station.

Weather

At the time of the incident, the temperature was 42° F and clear. SAFE has concluded that weather was not a contributing factor in this incident (Weather source: NOAA) – Location: Silver Spring, MD.)

Human Factors

Fatigue

Based on SAFE interview questions related to Fatigue Factors and a review of all employees' 30-day work history, SAFE determined, the employees' 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 employees 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

The probable cause of the Improper Roadway Worker Protection (RWP) event was that the AMF positioned themselves on the wrong side of the platform. A contributing factor was the human performance difficulties experienced by the Advanced Mobile Flagger (AMF) when they informed the RWIC that they were in position, however they were not. Based on the AIMS Playback and radio communications timelines the AMF was still on board train ID 109 and not positioned at the 8-car marker as required. Upon arriving at Takoma Station the AMF lost their situational awareness, causing their failure to position themselves at the proper 8-car marker in the direction the Mobile Work Crew would be travelling. The AMF not being positioned at the 8-car marker allowed one train to pass by the Mobile Work Crew, subsequently resulting in the Improper Roadway Worker Protection event. The AMF was not in compliance with Metrorail Safety Rules and Procedures Handbook (MSRPH) Train Roadway Worker Protection, section 5.13.6, "*Under the direction of the RWIC, the AMF will position themselves at the next station ahead (in the direction the mobile crew will be walking*). *The AMF will take their position at the end of the platform (8 car marker or end gate area) in the direction the train is traveling, and on the mobile crew is inspecting.*

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
90453_SAFECAPS_RTRA_001	AMF should undergo RWP re-training with emphasis on AMF procedures.
90453_SAFECAPS_OPMS_002	OPMS shall use past AMF RWP incident in training modules as how to properly apply the AMF mateiral.
90453_SAFECAPS_OPMS_003	OPMS shall ensure AMF training focuses on physical characteristics training, to include but not limited to track orientation. Training should also reinforce stopping movement/work if AMFs think they are disorientated until location confirmation is obtained via physical markers. AMFs should confirm their location over the radio by calling out the track marker at their assigned location.
90453_SAFECAPS_OPMS_004	OPMS shall include AMF site performance assessments, including documented evaluations.

Appendix A - Interview Summaries

Track and Structures (TRST

Track Inspector/Roadway Worker in Charge (RWIC)

The RWIC is a WMATA employee with 4 years of experience as a Track Inspector.

Based on the SAFE interview, the RWIC reported that they were performing a track inspection between Rhode Island Avenue Station and Silver Spring Station. The RWIC stated that upon completion of their Roadway Job Safety Brief (RJSB) they commenced their walk between Rhode Island Avenue and Brookland Stations. The RWIC stated that they utilized two AMF(s) to traverse between stations perform their inspection more efficiently; the RWIC reported that the AMF involved in the incident performed flagging duties at Brookland Station during their initial walk. When personnel arrived at Fort Totten Station, they contacted the Radio RTC to report that all personnel were clear of the roadway and requested that they continue their inspection between Fort Totten and Takoma Stations. The RWIC reported that they were instructed to communicate directly to the AMF to confirm that the AMF was on location at Takoma Station to notify Train Operators departing the station of personnel on the roadway. The RWIC reported that they contacted the AMF to confirm their location and the AMF reported that they were in place and ready for flagging duties. Upon receiving permission from the Radio RTC the RWIC stated that they walk 100 ft. from the roadway when they observed a revenue train in approach, the RWIC instructed all personnel to stand at a place of safety. The RWIC reported that the Train did not sound their horn, however when the train observed personnel on the roadway, they stopped their train. The RWIC reported that the Train Operator reported to ROCC that there was no AMF on the platform at Takoma Station. The RWIC reported that they were then instructed to clear the roadway. The RWIC stated that they trusted that their AMF was in place providing protection for personnel on the roadway

Advance Mobile Flagger (AMF)

The AMF is a WMATA employee with 1 year of experience as a Track Inspector.

Based on the SAFE interview, the AMF reported that when the personnel arrived at Fort Totten Station, they boarded a revenue train on Track 1 toward Takoma Station. The AMF stated that when the RWIC contacted them over the radio to ascertain if they were in place to perform flagging duties at Takoma Station Track 2. The AMF stated that they told the RWIC that they were on location and set up to perform AMF responsibilities, however, the AMF was still aboard the Train in approach to Takoma Station. The AMF reported that when they exited the train, they proceeded to stand by Track 1 instead of Track 2. The AMF reported that when they exited the train to standby Track 1, they did not notify the RWIC that they were on the platform due to stating earlier over the radio that they were in position. The AMF reported that when they realized they were standing on the opposite track they turned to walk to Track 2 and observed Train ID 106 departing the platform; the AMF reported that they did not make an attempt to contact the RWIC to notify them that the train was in approach. The AMF stated that moving forward they would ensure to notify the RWIC that they need more time to make it to the station ensuring they were properly set up.