

**FINAL REPORT OF INVESTIGATION A&I E17189**  
March 31, 2017  
RWP Event

*Adopted by the Metrorail Safety Commission at its meeting on May 14, 2019.*

Washington Metrorail Safety Commission  
777 North Capitol Street, NE, Suite 402  
Washington, DC 20002



**FINAL REPORT OF INVESTIGATION A&I E17189**

**SMS 20170331#61853**

<b>Date of Event:</b>	3/31/2017
<b>Type of Event:</b>	RWP Event
<b>Incident Time:</b>	12:50 hrs.
<b>Location:</b>	Between East Falls Church (K05) and Ballston (K04), Track 1
<b>Time and How received by SAFE:</b>	12:50 hrs. - SAFE Reported Incident and was on location
<b>Safety Officer Response:</b>	Yes - 12:50 hrs.- SAFE was On-Site
<b>Time of Safety Officer Arrival:</b>	N/A
<b>Time of Safety Officer Departure:</b>	N/A
<b>Rail Vehicle:</b>	L3113-3112.1118-1119.3028-3029T
<b>Injuries:</b>	None
<b>Damage:</b>	None
<b>Emergency Responders:</b>	None

**Executive Summary**

On Friday, March 31, 2017 at approximately 12:50 hrs. a West Falls Church Division Train Operator (T/O) was observed by SAFE personnel operating the train at speeds in excessive of 10 mph between East Falls Church (K05) and Ballston (K04), Track 1. Roadway workers were in a place of safety at the time of incident.

The T/O began their shift at K05 station, upon assuming train operations of Train ID 612 at K05 station; ROCC made announcements via radio transmission that personnel were on the roadway. However, it is un clear to SAFE if the announcements were made prior to the T/O assuming train operations of Train ID 612.

The T/O stated observing Four (4) workers near an access gate on Track 1. The T/O further stated, one (1) worker gave the proceed hand signal; the T/O then reportedly sounded the horn (4 short blast) and reduced train speed down to 10 mph until the consist completely passed the work crew.

Based on salient facts as part of this investigation, SAFE concludes that when the Train Operator assumed the operation of Train ID 612 at East Fall Church, the Operator was not briefed nor did the Operator intersect the radio announcement informing Train Operators of the Track Inspectors located between East Falls Church (K05 and Ballston

Stations (B04). As a result, the Train Operator operated past the Track Inspection crew in excess of 10 MPH.

WMATA revised the Roadway Worker Protection (RWP) on April 28, 2017 with Permanent Order R-17-03, adding an Advance Mobile Flagger (AMF) to the RWP procedures.

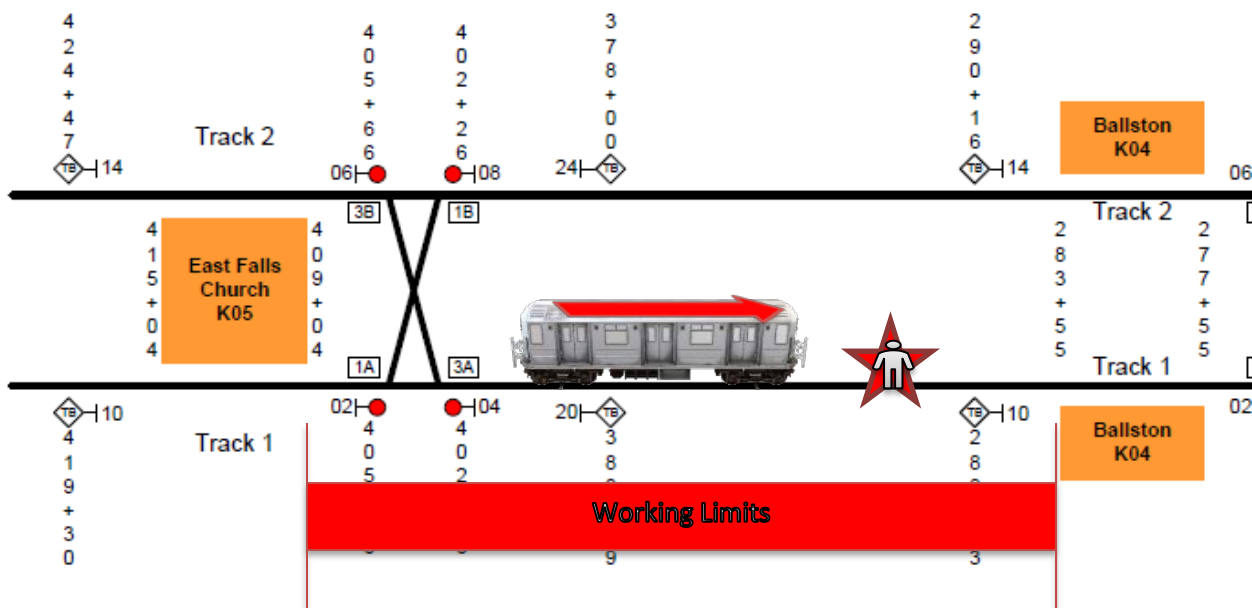
**Notification**

Title	Time	Comment:
FTA	14:42 hrs.	Email
TOC	14:42 hrs.	Email

**Incident Site**

Between East Falls Church (K05) and Ballston (K04), Track 1

**Field Sketch/Schematics**



## **Investigation**

SAFE personnel reported to Rail Operations Control Center (ROCC) via landline that Silver Line Train, Train ID 612, passed personnel on the roadway in excessive of 10 mph at Chain Marker (CM) K1-342+00. At the time of incident, SAFE was standing in a place of safety outside the fence line at K05 station near K1-342+00 on route 66.

The T/O began their shift at K05 station, upon assuming train operations of Train ID 612 at K05 station; ROCC made announcements via radio transmission that personnel were on the roadway. However, it is un clear to SAFE if the announcements were made prior to the T/O assuming train operations of Train ID 612.

### **Interview(s):**

#### **Office of Rail Transportation (RTRA)**

Train Operator

Per the T/O statement, while traveling towards Ballston (K04) Station on Track 1 in a curved section of track, the T/O stated observing Four (4) workers near an access gate on Track 1. The T/O further stated, one (1) worker gave the proceed hand signal; the T/O then reportedly sounded the horn (4 short blast) and reduced train speed down to 10 mph until the consist completely passed the work crew. The T/O stated being unaware that personnel were on the roadway prior to the event and then contacted ROCC via radio transmission questioning if there were any more personnel on the roadway since this was his first trip of the day.

#### **Vehicle Engineering (CENV)**

CENV was not requested to perform a VMS (Vehicle Monitoring System) download and analysis.

#### **Audio Recording System (ARS)**

ROCC Assistant Superintendent

Based on ARS playback, at 12:52 hrs., March 31, 2017, ROCC personnel contacted SAFE via landline telephone to report Train ID 612 reportedly passed personnel on the roadway between (K05) and (K04) stations in excess of 10 mph. ROCC further stated, the T/O of Train ID 612 assumed control of the aforementioned consist at K05 Station and did not operate the consist from Wiehle (N06).

### **Human Factors**

Post-Incident

The T/O was not removed from service for post-incident testing as a result of this event.

## Fatigue

Based on SAFE's review of the personnel involved 30-day work history, it was determined that the all personnel hours of service were in accordance with WMATA's *Fatigue Risk Management Policy 10.6* and *Hours of Service Limitations for Prevention of Fatigue Policy 10.7*.

## Communications Section (COMM)

Upon further inspection, COMM did not report any anomalies with the radio system in the affected area.

## Weather

At the time of the incident, the temperature was 48°F with rain and fog. SAFE has concluded that weather was not a contributing factor in this incident based on interview with the Train Operator (Weather source: National Oceanic Atmosphere Administration (NOAA) – Location: Falls Church, VA.)

## Findings

- The T/O was not notified personnel were on the roadway prior to leaving K05.

## Conclusion

Based on salient facts as part of this investigation, SAFE concludes that when the Train Operator assumed the operation of Train ID 612 at East Fall Church, the Operator was not briefed nor did the Operator intersect the radio announcement informing Train Operators of the Track Inspectors located between East Falls Church (K05 and Ballston Stations (B04). As a result, the Train Operator operated past the Track Inspection crew in excess of 10 MPH.

Since this incident, WMATA has made significant changes to the Roadway Worker Protection Section 5 within the Metrorail Safety Rules and Procedures Handbook (MSRPH) which includes implementation of an Advanced Mobile Flagger to provide more protection for personnel on the roadway.

## Immediate Mitigation to Prevent Re-Occurrence

- Train ID 612 was removed from service for post-incident investigation

## Corrective Action Plan

1. WMATA shall take the appropriate action to include but not limited the development an AMF within the Roadway Worker Protection Guide, and any other action deemed necessary to support prevention of repeated RWP event:
  - a. **WMATA revised the Roadway Worker Protection on April 28, 2017 with Permanent Order R-17-03. Refer to attachments 1-7.**

## **Attachments**



# Washington Metropolitan Area Transit Authority

ROADWAY WORKER PROTECTION MANUAL

## PERMANENT ORDER

**NO. R- 17-03 Advanced Mobile Flagger**

**Date:** Friday April 28, 2017

**TO:** All Personnel

Permanent Order R-17-03 identifies the introduction and procedures of the Advanced Mobile Flagger (AMF).

### Definitions:

**ADVANCED MOBILE FLAGGER (AMF)** – A person stationed at the end of a platform (8 car marker or end gate) in the direction in which a Class I/Class II Vehicle is normally traveling, equipped with a Flashing Amber Lantern/E-Flare and Orange Flag. The duties of the AMF are to notify all Class I/Class II vehicle operators that a Mobile Work Crew is on the tracks ahead of them.

#### **AMF Requirements:**

1. The AMF must be Roadway Worker Protection (RWP) Level 2 or Level 4 qualified.
2. The AMF receives direction from the Roadway Worker In Charge (RWIC) of the Mobile Work Crew to which they are assigned.
3. The AMF is required to follow Personal Protective Equipment (PPE) guidelines per the Minimum PPE Standard for On-Track Safety in the Roadway Worker Protection Manual (RWPM).
4. In addition to the PPE required, the following equipment is also required when performing the duties of an AMF:
  - WMATA Approved Flashing Amber Lantern/E-Flare and Orange Flag
  - WMATA Approved and Calibrated Working Radio
  - WMATA Approved Air Horn and Whistle

**FLASHING AMBER LANTERN/E-FLARE** – A signaling device which displays a flashing amber light.

**ORANGE FLAG** – A WMATA approved Orange Flag that acts as a signaling device. It measures 18in. x 18in.

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**Procedures:**

**RWIC (Roadway Worker in Charge) Procedures:**

1. The RWIC duties remain the same as published under Key Personnel in Section 1, Roadway Worker-In-Charge, as published in the RWPM.
2. In addition, the RWIC will assign and identify the employee in the Mobile Work Crew who will fulfill the duties of the AMF. While checking the AMF for the required WMATA approved PPE, the RWIC will also ensure that the AMF has the following equipment:
  - WMATA Approved Flashing Amber Lantern/E-Flare and Orange Flag
  - WMATA Approved and Calibrated Working Radio
  - WMATA Approved Air Horn and Whistle
3. The RWIC will direct the AMF to 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) in the direction the train is traveling, and on the track the Mobile Work Crew is inspecting.
4. Once the AMF has taken their position on the platform ahead of the Mobile Work Crew, they will place their Flashing Amber Lantern/E-Flare into its base and position it at the end of the platform (8 car marker or end gate) in the direction the train is traveling, and on the track their crew is inspecting. The AMF will hold the Orange Flag in their hand. The AMF will then notify the RWIC that they are in place and the Flashing Amber Lantern/E-Flare and Orange Flag has been positioned.
5. The RWIC will contact ROCC and request permission to enter the Roadway to complete Mobile Work Crew tasks (e.g. Track Inspections). The RWIC will also request from ROCC, the location of any trains on the track, which may currently be operating or stopped between the station where the AMF is positioned and the station where the RWIC is preparing to enter the Roadway. Once the ROCC gives the RWIC permission to enter the Roadway, normal RWP procedures will resume. The RWIC will note their "On Track Time" given by ROCC.
6. Once the RWIC, with their Mobile Work Crew, reaches the platform where the AMF is setup, the RWIC then follows this same process when sending the AMF to the next station.

NOTE: This process will be repeated until the Mobile Work Crew completes their assignment for the day and clears the roadway with ROCC.

**Advanced Mobile Flagger (AMF) Procedures:**

1. The AMF will be identified and assigned by the RWIC of the Mobile Work Crew.
2. The AMF is required to follow PPE guidelines per the Minimum PPE Standard for On-Track Safety in the RWPM.
3. In addition to the PPE required, the following equipment is also required when performing the duties of an AMF:
  - WMATA Approved Flashing Amber Lantern/E-Flare and Orange Flag

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- WMATA Approved and Calibrated Working Radio
  - WMATA Approved Air Horn and Whistle
4. 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) in the direction the train is traveling, and on the track the Mobile Work Crew is inspecting.
  5. Once the AMF has taken their position on the platform ahead of the Mobile Work Crew, they will place their Flashing Amber Lantern/E-Flare into its base and position it at the end of the platform (8 car marker or end gate) in the direction the train is traveling, and on the track their crew is inspecting. The AMF will hold the Orange Flag in their hand.
  6. The AMF must establish positive communication, i.e., via phone, radio, etc. to notify the RWIC that they are in place and the Flashing Amber Lantern/E-Flare and Orange Flag has been positioned.
  7. As the Class I/Class II vehicle approaches the AMF and their Flashing Amber Lantern/E-Flare and Orange Flag, the AMF is to ensure that the Class I/Class II Vehicle stops at their location. If the Class I/Class II Vehicle Operator does not blow two (2) short blasts of their mainline horn to acknowledge the presence of the AMF, the AMF must immediately give the WMATA Approved Hand Signal to stop utilizing the Orange Flag. The AMF must continuously give this Hand Signal utilizing the Orange Flag until the vehicle acknowledges them with two (2) short horn blasts, or comes to a complete stop.
  8. If the Class I/Class II Vehicle fails to stop at the AMF's location and is proceeding towards the Mobile Work Crew, the AMF must make an immediate transmission on the radio to the RWIC. AMF will advise the RWIC and all personnel to clear the Roadway immediately. The AMF will notify the RWIC that a Class I/Class II Vehicle is approaching them. The incident must also be reported to ROCC, at the first available opportunity, so that an investigation can commence.
  9. When the Class I/Class II Vehicle stops at the end of the platform (8 car marker or end gate), the AMF is to inform the Class I/Class II Vehicle Operator, verbally face-to-face, that there is a Mobile Work Crew ahead, by using the approved AMF Script, as follows:

**SCRIPT THE AMF WILL READ, FACE-TO-FACE, TO CLASS I/CLASS II VEHICLE OPERATOR**

"THERE IS A MOBILE WORK CREW AHEAD.

YOU MUST OPERATE YOUR CLASS I/CLASS II VEHICLE AT ONE-HALF OF YOUR REGULATED SPEED.

ONCE YOU DEPART FROM THE PLATFORM, YOU ARE REQUIRED TO BLOW YOUR MAINLINE HORN CONTINUOUSLY, USING SHORT HORN BLASTS. UPON OBSERVING THE MOBILE WORK CREW, FURTHER REDUCE YOUR SPEED TO 10 MPH. AND BE PREPARED TO STOP.

YOU MUST NOT PROCEED PAST THE WORK CREW UNTIL YOU RECEIVE THE PROPER WMATA APPROVED HAND SIGNAL TO PROCEED.

IF YOU DO NOT RECEIVE THE PROPER HAND SIGNAL, YOU MUST STOP.

AFTER YOU RECEIVE THE PROPER HAND SIGNAL TO PROCEED, YOU MUST OPERATE AT 10 MPH. UNTIL THE ENTIRE TRAIN HAS CLEARED THE PERSONNEL ON THE TRACK.

ONCE THE REAR OF YOUR CLASS I/CLASS II VEHICLE HAS PASSED THE ENTIRE MOBILE WORK CREW, YOU THEN MAY RESUME NORMAL REGULATED SPEED FOR YOUR CLASS I/CLASS II VEHICLE."

**WARNING:** The AMF will not give a Class I or Class II operator the permission to advance if "Foul Time" is in effect. The AMF will inform the Class I or Class II operator to follow the instructions from ROCC when "Foul Time" is in effect. Once "Foul Time" is relinquished by the RWIC, the AMF can instruct the Class I or Class II operator to proceed by using the above script.

#### **AMF Procedures for Locations with Connecting Rail Lines**

For an inspection commencing at A02 (Farragut North); while walking INBOUND on TRACK #2, **you must request Foul Time** from the platform at A02 CM A2 38+35, until you call clear on the outbound side of the C&A Connection on track #2 at CM A2 37+10.

For an inspection commencing at B06 (Fort Totten); while walking INBOUND on TRACK #1, **you must request ROCC OPS #1 Controller to HOLD ALL MOVEMENTS** from the E-line to the B-line operating through the B&E Connection at CM B1 262+25. This will be until you call clear on the inbound side of the B&E Connection on track #1 at CM B1 262+25.

For an inspection commencing at C13 (King Street); while walking OUTBOUND on TRACK #1 **you must request Foul Time** from the platform at C13 CM C1 557+75 until you call clear on the outbound side of C97 Interlocking at CM 571+60 on the J-line or C-line track #1.

For an inspection commencing at C07 (Pentagon); while walking INBOUND on TRACK #2, **you must request Foul Time** from the platform at C07 CM C2 256+30 until you call clear on the inbound side of C07 Interlocking CM C2 256+10 on the C-line or the L-line track #2.

For an inspection commencing at C05 (Rosslyn); while walking OUTBOUND on TRACK #1, **you must request Foul Time** from the platform C05 CM C1 144+75 until you call clear on the outbound side of C05 interlocking CM C1 147+00 on the K-line or C-line track #1.

For an inspection commencing at C14 (Eisenhower); you are walking INBOUND on TRACK #2, **you must request Foul Time** at C14. CM 592+00.

For an inspection commencing at D09 (Stadium), while walking OUTBOUND on TRACK #2.

**You MUST HAVE TWO AMFs** - ONE at G01 (Benning Road) and ONE at D10 (Minnesota).

For an inspection commencing at E07 (West Hyattsville); while walking INBOUND on TRACK #1, **you must request ROCC OPS #3 Controller to HOLD ALL MOVEMENTS** from the B-line to the E-line operating through the B&E Connection at CM E1 275+50. This will be until you call clear on the inbound side of the B&E connection track #1 CM E1 275+00.

For an inspection commencing at F03 (L'Enfant); while walking OUTBOUND on TRACK #1, **you must request Foul Time** from the platform F03 CM F1 51+25 until you call clear on the outbound side of F03 interlocking on the L-line or F-line track #1.

For an inspection commencing at K05 (East Falls Church); you are walking OUTBOUND on TRACK #1, **you MUST HAVE TWO AMFs** - ONE at K06 (West Falls) and ONE at N01 (McLean).

**NOTE:** All Chain Markers are approximate. Ensure the Mobile Work Crew is clear of the dynamic envelope of the connecting line before relinquishing Foul Time.

**Class I/Class II Vehicle Operator Procedures:**

1. As the Class I/Class II Vehicle Operator approaches a Flashing Amber Lantern/E-Flare and the AMF holding the Orange Flag, they **MUST** sound two (2) short blasts on their Mainline horn to acknowledge the presence of the AMF, and **MUST** come to a complete stop at the end of the platform (8 car marker or end gate).
2. The Class I/Class II Vehicle Operator will receive verbal face-to-face instructions from the AMF, using the script, included in this Permanent Order.
3. The Class I/Class II Vehicle Operator will depart the station at one-half the regulated speed and blow their Mainline horn continuously, using short horn blasts, until the operator observes the Mobile Work Crew.
  - a. The Class I/Class II Vehicle Operator **MUST REMAIN VIGILANT** and on the lookout for the Mobile Work Crew as communicated by the AMF.

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- b. Upon observing the mobile work crew, the Class I/Class II Vehicle Operator **MUST** reduce speed to 10 mph. and be prepared to stop.
4. If the Class I/Class II Vehicle Operator **DOES NOT** receive the proper WMATA Approved Hand Signal to proceed from the Mobile Work Crew, the Class I/Class II Vehicle Operator **MUST STOP IMMEDIATELY**.
5. Once the Class I/Class II Vehicle Operator reaches the location of the Mobile Work Crew Watchman/Lookout, and receives the WMATA Approved Hand Signal to proceed, the Class I/Class II Vehicle Operator will sound the Mainline horn, using two (2) short blasts, to acknowledge the Hand Signal being given by the Mobile Work Crew, then operate at a speed no greater than 10 mph past the entire Mobile Work Crew.  
NOTE: All operators are reminded they must adhere to permanent order T-16-07 "Introduction of 10MPH Speed Restriction on Tracks Where Workers Are Present".
6. Once the rear of the Class I/Class II Vehicle has passed the entire Mobile Work Crew, the Operator then may resume normal regulated speed for their Class I/Class II Vehicle.

**WARNING:** When "Foul Time" is in effect all operators must follow the instructions from ROCC.

**Rail Operations Control Center (ROCC) Procedures:**

Should any personnel report a close call during any Mobile Work Crew activity, ROCC must immediately take action to ensure all personnel are safe and in the clear. ROCC will direct all personnel that work will be suspended. ROCC will identify the train involved, wayside personnel and any other factors involved in the incident. ROCC will immediately notify SAFE and other departments, as required, so an investigation can commence.

**Approval of Permanent Order 17-03**

Chief Operating Officer  
Operations

Chief Safety Officer  
Department of Safety &  
Environmental Management

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