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WMSC Commissioner Brief: W-0083 – Fatality – Navy Yard Station – December 16, 2020

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

Safety event summary:

A Metrorail customer who had been sitting on a bench in the Navy Yard Station stood up and walked toward the edge of the platform as a Green Line train approached the station. CCTV video shows the person entering the roadway approximately 400 feet down the platform from where the train was about to enter the station. The person briefly lay motionless between the running rail and the platform edge. It appears from CCTV video reviewed by the WMSC that the person may have entered the roadway deliberately, however it cannot be conclusively determined, so it remains possible that the person could have fallen unintentionally.

The train entered the station at 44 mph and slowing, with the Master Controller in B5 braking mode (the second-highest level of braking). The Train Operator did not activate emergency braking via either the Master Controller or the emergency brake “mushroom” button.

The person attempted to climb back up to the station platform as the train approached their location, however Train 505 struck the person. The train was moving approximately 19.4 mph at the time of the collision.

The train stopped approximately 75 feet beyond the location where the person was struck.

Customers on the train were offloaded to the station platform, with customers in cars that had not yet reached the platform walked through the train so that they could exit directly to the platform.

Probable Cause:

The probable cause of this event was a customer entering the roadway. Contributing to this fatality was Metrorail’s lack of training and oversight to ensure train operators enter stations at appropriate speeds and react appropriately to unexpected events or obstructions such as a person who has fallen onto the roadway.

Corrective Actions:

Metrorail repaired the front-end cowling of Train 505’s lead car, 7164.

WMSC staff observations:

RTRA training had specified that trains in manual mode should enter the station at 37 mph to 42 mph.

After this event, and in relation to Corrective Action Plans (CAPs) Metrorail developed in response to WMSC findings unrelated to this event, Metrorail instituted a maximum station entry speed of 40 mph. It is important that Metrorail monitor this and other safety rules through robust ride checks, efficiency testing and on-the-job training that Metrorail has committed to following other investigations.

Staff recommendation: Adopt final report.

Washington Metro Area Transit Authority

Department of Safety and Environmental Management (SAFE)

FINAL REPORT OF INVESTIGATION A&I E20497

Date of Event:	12/16/2020
Type of Event:	Person Struck by Train
Incident Time:	06:45 hrs.
Location:	Navy Yard Station, Track 1
Time and How received by SAFE:	06:47 hrs. SAFE On-call Phone
WMSC Notification Time:	07:18 hrs. WMSC On-call Phone
Responding Safety Officers:	WMATA SAFE: Yes WMSC: No Other: N/A
Rail Vehicle:	Train ID 505 **L7164**-65x7015-14x7174-75x7215-16T
Injuries:	Fatality
Damage:	None
Emergency Responders:	SAFE, DCFEMS, RTRA, CMNT, MTPD, and PLNT.
SMS I/A Incident Number:	20201216#90813MX

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Abbreviations and Acronyms

AIMS	Advanced Information Management System
ARS	Audio Recording Service
CCTV	Closed Circuit Television
CENV	Vehicle Program Services
DCFEMS	District of Columbia Fire and Emergency Medical Services
DCOCME	Office of the Chief Medical Examiner
ER	Event Recorder
FT	Foul Time
MC	Master Controller
MOC	Maintenance Operations Center
MSRPH	Metro Safety Rules Procedures Handbook
MTPD	Metro Transit Police Department
OSC	On-scene Commander
PLNT	Plant Maintenance
ROCC	Rail Operations Control Center
ROIC	Rail Operations Information Center
RTC	Rail Traffic Controller
RTRA	Office of Rail Transportation
SOP	Standard Operating Procedure
VMDS	Vehicle Monitoring and Diagnostic System

Executive Summary

On Wednesday, December 16, 2020, an unidentified person transitioned to the platform level via the escalator and appeared to be in a disoriented state and unsteady on their feet. The unidentified person sat on a bench and later stood to their feet at 06:44:45 hrs. After standing, the unidentified person wandered near the edge of the platform and subsequently fell to the roadway approximately 215 feet from the 8-car marker at 06:45:20 hrs.

At approximately 06:45:40 hrs., a Green Line train [Train ID 505 consist **L7164**-65x7015-14x7174-75x7215-16T] on Track 1 traveling outbound in the direction of Branch Ave Station, entered Navy Yard Station platform limits and made contact with a person on the roadway. The Train Operator of Train ID 505 notified the Rail Operations Control Center (ROCC) Radio Rail Traffic Controller (RTC) of the event. The Radio RTC acknowledged the transmission, made the respective calls to Rail Operation Information Center (ROIC), ROCC Assistant Superintendent, and proceeded to dispatch an Office of Rail Transportation (RTRA) Supervisor. Persons aboard Train ID 505 were walked through the trailing cars and exited onto the Navy Yard Station platform assisted by RTRA personnel. There were no reported injuries to persons aboard the train or WMATA personnel. RTRA removed the Train Operator from service for post-incident toxicology testing and subsequent MTPD interview.

An RTRA Supervisor onboard Train ID 505 contacted the Radio RTC to assist as directed. At 6:46:40 hrs., the Radio RTC acknowledged the RTRA supervisor and designated them as the On-scene Commander, implemented SOP 1A, and instructed the RTRA supervisor to offload the customers to the platform. The Radio RTC also dispatched an additional RTRA supervisor.

Based on Advanced Information Management System (AIMS) Playback, at 06:46:32 hrs., the Buttons RTC de-energized third rail power on Track 1. The ROCC Assistant Superintendent notified the District of Columbia Fire and Emergency Medical Services (DCFEMS), and the Maintenance Operation Control (MOC) Assistant Superintendent notified Metro Transit Police Department (MTPD) at approximately 06:46 hrs.

At 06:53:25 hrs., MTPD arrived at Navy Yard Station; the Radio RTC appointed the MTPD officer as the On-Scene-Commander (OSC) and appointed the RTRA Supervisor as the RTRA Forward Liaison. At approximately 06:54:25 hrs., DCFEMS arrived on the scene.

The unidentified person sustained fatal injuries and was pronounced deceased at the scene at 07:20 hrs. The District of Columbia (D.C.) Medical Examiner's Office (DCOCME) arrived on the scene and initiated their investigation at 08:09 hrs.

At approximately 08:48 hrs., MTPD requested third rail power be re-energized to move Train ID 505 in the direction of Greenbelt Yard to conduct their investigation and once completed, MTPD cleared the incident scene and relinquished control to RTRA at 09:53 hrs.

The Office of Plant Maintenance Department (PLNT) personnel were standing by on the platform and were permitted to enter the roadway under Foul Time (FT) Roadway Worker Protection (RWP) to disinfect the roadway in preparation for mainline restoration. At 10:23 hrs., third rail power was re-energized at Navy Yard Station, Track 1, and normal service resumed on the mainline.

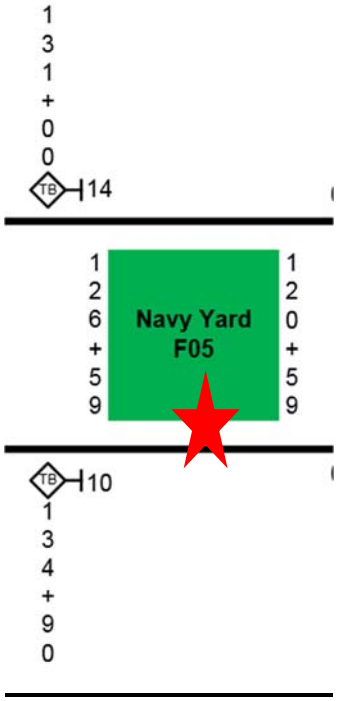
The probable cause of the Navy Yard Station person struck by train event, was a person fell onto the roadway and unintentionally placed themselves in the train's dynamic envelope. As the person attempted to exit the roadway, Train ID 505 consequently struck them.

An analysis of data collected from the record systems, staff incident report reviews, and Closed-Circuit Television (CCTV) review determined no safety deficiencies related to any WMATA station facility or rail vehicle failures contributed to the person being struck by the train. A review of VMDS revealed, the Train Operator of Train ID 505 did apply the master controller to B5, but did not apply the emergency stop pushbutton before striking the unidentified person. The Train Operator was not in compliance with MSRPH Operating Rules 3.91 *"Rail vehicles shall not be operated so as to collide with another vehicle, bumping post, or obstruction. Train Operators shall report any couplings that may have resulted in equipment damage to either the ROCC or the Interlocking Operator. Train Operators shall activate the emergency stop pushbutton (mushroom) any time a train must be stopped to prevent a collision with any object or when the train fails to respond to a call for normal braking from the Master Controller (MC)."*

Incident Site

Navy Yard Station, Track 1

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 the person Struck by Train incident notification at Navy Yard Station on December 16, 2020, SAFE launched a cross-functional investigation into this event. SAFE team members worked with relevant WMATA subject matter experts to review the incident's facts and data.

The investigative methodologies included the following:

- Physical Site Assessment.

- Formal Interviews – As of the date of the submittal of the final report, SAFE was unable to interview the Train Operator due to being out on leave for an undetermined amount of time.

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

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

- System Data Recording Review – A collection of information contained in Metro Data Recording Systems. This data includes:
    - Audio Recording System (ARS) playback [Radio and Phone Communications]
    - Advance Information Management System (AIMS) playback Review
    - Closed-Circuit Television (CCTV) Review

Investigation

On Wednesday morning, December 16, 2020, an unidentified person transitioned to the platform level via the escalator and appeared to be in a disoriented state and unsteady on their feet. The unidentified person sat on a bench and later stood to their feet at 06:44:45 hrs. After standing, the unidentified person wandered near the edge of the platform and subsequently fell to the roadway approximately 215 feet from the 8-car marker at 06:45:37 hrs.

Photo 1 – Location where the person fell off the platform, approximately 215 feet from the 8-car marker.

At 6:45:41:01 hrs., a Green Line train [Train ID 505 consist **L7164**-65x7015-14x7174-75x7215-16T] on Track 1 traveling outbound in the direction of Branch Ave Station, entered Navy Yard Station platform limits "at 44 mph in the B5 braking position" per Vehicle Program Services (CENV) data analysis. Based on a Navy Yard Station CCTV playback review, the unidentified person fell between the running rail and area of refuge. The unidentified person remained motionless until 06:45:47 hrs. The unidentified person then attempted to climb back up to the station platform as Train ID 505 traversed Navy Yard platform limits.

According to the Train Operator's written statement upon arriving at Navy Yard and saw a unidentified person on the roadway trying to climb back up on the platform. The Train Operator blew the horn and dumped the train.

Based on CCTV playback and CMOR IIT data, the Train Operator of Train ID 505 subsequently struck the unidentified person at 06:45:53 hrs. At 6:45:57.05 hrs., the consist came to a complete stop 142 feet from the 8-car marker.

Photo 2 – Train Operator of Train ID 505 came to a complete stop approximately 142 feet from the 8-car marker.

The Train Operator of Train ID 505 notified the ROCC Radio RTC of the event. The Radio RTC acknowledged the transmission, made the respective calls to ROIC, ROCC Assistant Superintendent, and proceeded to dispatch an RTRA Supervisor. Customers aboard Train ID 505 were walked through the trailing cars and exited onto the Navy Yard Station platform assisted by RTRA personnel. There were no reported injuries to persons aboard the train or WMATA personnel.

An RTRA supervisor onboard Train ID 505 contacted the Radio RTC to assist as directed. At 6:46:40 hrs., the Radio RTC acknowledged the RTRA supervisor and designated them as the On-scene Commander, implemented SOP 1A, and instructed the RTRA supervisor to offload customers to the platform; additionally, the Radio RTC dispatched an additional RTRA supervisor. Based on AIMS Playback, at 06:46:32 hrs., the Buttons RTC de-energized third rail power Navy Yard Station, Track 1.

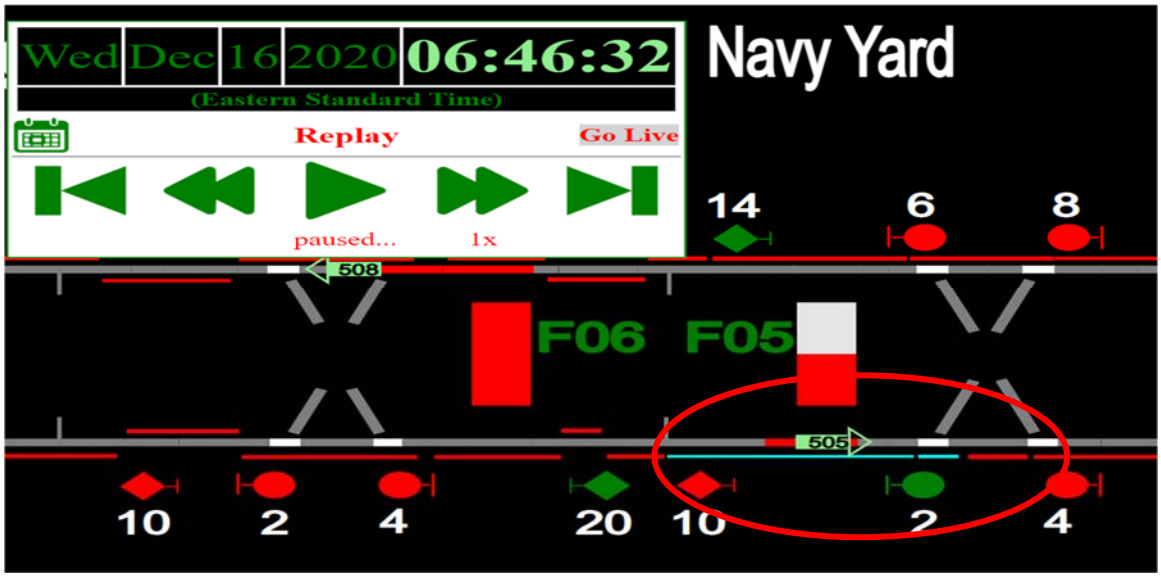


Photo 3: AIMS indication shows third rail power de-energized at Navy Yard Station, Track 1.

The ROCC Assistant Superintendent notified the DCFEMS, and the MOC Assistant Superintendent notified MTPD at approximately 06:46 hrs.

At 06:53:25 hrs., MTPD arrived at Navy Yard Station; the Radio RTC appointed the MTPD officer as the OSC and appointed the RTRA Supervisor as the RTRA Forward Liaison. At approximately 06:54:25 hrs., DCFEMS arrived on the scene.

The unidentified person sustained fatal injuries and was pronounced deceased at the scene at 07:20 hrs. The DCOCME arrived on the scene and initiated their investigation at 08:09 hrs.

At approximately 08:48 hrs., MTPD requested third rail power be re-energized to move Train ID 505 in the direction of Greenbelt Yard. Upon clearing Train ID 505 from the platform limits to conduct their investigation, MTPD cleared the incident scene and relinquished control to RTRA at 09:53 hrs.

PLNT personnel were standing by on the platform and permitted to enter the roadway under foul time (FT) to disinfect the roadway in preparation for mainline restoration. At 10:23 hrs., third rail power was re-energized at Navy Yard Station, Track 1, and normal service resumed on the mainline.

An analysis of data collected from the record systems, interviews with staff, and CCTV review determined no safety deficiencies related to any WMATA station facility, vehicle, or human factor components contributed to the person being struck by the train.

SAFE conducted a site assessment and determined there was no slip or trip hazards present that would have contributed to this event. All platform emergency notification equipment was working as designed.

Chronological Event Timeline

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

Time	Description
06:45:57 hrs.	[Radio] Train ID 505 Train Operator: Emergency, emergency, emergency
06:46:03 hrs.	[Radio] The Radio RTC: Go to Central over.
06:46:05 hrs.	[Radio] Train ID 505 Operator: Person struck by the train, Navy Yard Station, Track 1.
06:46:10 hrs.	[Radio] Radio RTC confirmed the report of a person struck by a train.
06:46:25 hrs.	[Ambient] Radio RTC informed the ROIC specialist and the ROCC Assist. Superintendent of the Person struck by a train at Navy Yard Station, Track 1.
06:46:32 hrs.	[AIMS] Third rail power was de-energized Navy Yard Station, Track 1.
06:46:40 hrs.	[Radio] A RTRA supervisor onboard Train ID 505 contacted Radio RTC and offered assistance.
06:46:51 hrs.	[Radio] Radio RTC acknowledged the RTRA supervisor and designated them as the On-scene Commander and implemented SOP 1A.
06:47:30 hrs.	[Radio] RTRA supervisor located the person under the lead Car 7164.
06:47:48 hrs.	[Radio] Radio RTC: Instructed the RTRA supervisor to offload the customers to the platform.
06:48:10 hrs.	[Radio] Radio RTC dispatched an additional RTRA supervisor.
06:53: 25 hrs.	[CCTV] An MTPD officer arrived on the scene.
06:54:25 hrs.	[CCTV] The DCFEMS arrived on the scene.
07:20:24 hrs.	[CCTV] The Person was removed from the roadway by the DCFEMS.
07:20:45 hrs.	The person was pronounced dead at the scene by the DCFEMS physician.
08:09:30 hrs.	[CCTV] DCOCME arrived at the scene.
08:37:11 hrs.	[CCTV] DCOCME removed the person from the platform.

Note: Times above may vary from other data based on clock settings.

Office of Chief Mechanical Officer (CMOR) Incident Investigation Team (IIT)

Event Recorder (ER) Data Graph/Sequence of Events

Based on CMOR IIT analysis of the downloaded VMDS and ER. Details from the data analysis are as follows:

Time	Description
6:45:40:03 hrs.	The Train Operator of Train ID 505, Lead Car 7164, MC, placed in the B5 position, traveled at 44.8 mph, 75.2 feet before entering Navy Yard Station, Track 1.
6:45:41:01 hrs.	The Train Operator of Train ID 505, Lead Car 7164, entered Navy Yard Station, Track 1, at 44.3 mph with the MC in the B5 position.
6:45:57:08 hrs.	The Train Operator of Train ID 505, Lead Car 7164, struck a person on the roadway.
6:45:57.05 hrs.	The Train Operator of Train ID 505 came to a complete stop 142 feet from the 8-car marker, and Zero speed energized.
6:46:17:08 hrs.	The Train Operator of Train ID 505, Lead Car 7164, keyed down.

Based on CMOR IIT data analysis, the Train Operator did not activate the emergency pushbutton.

Note: Times above may vary from other data based on clock settings.

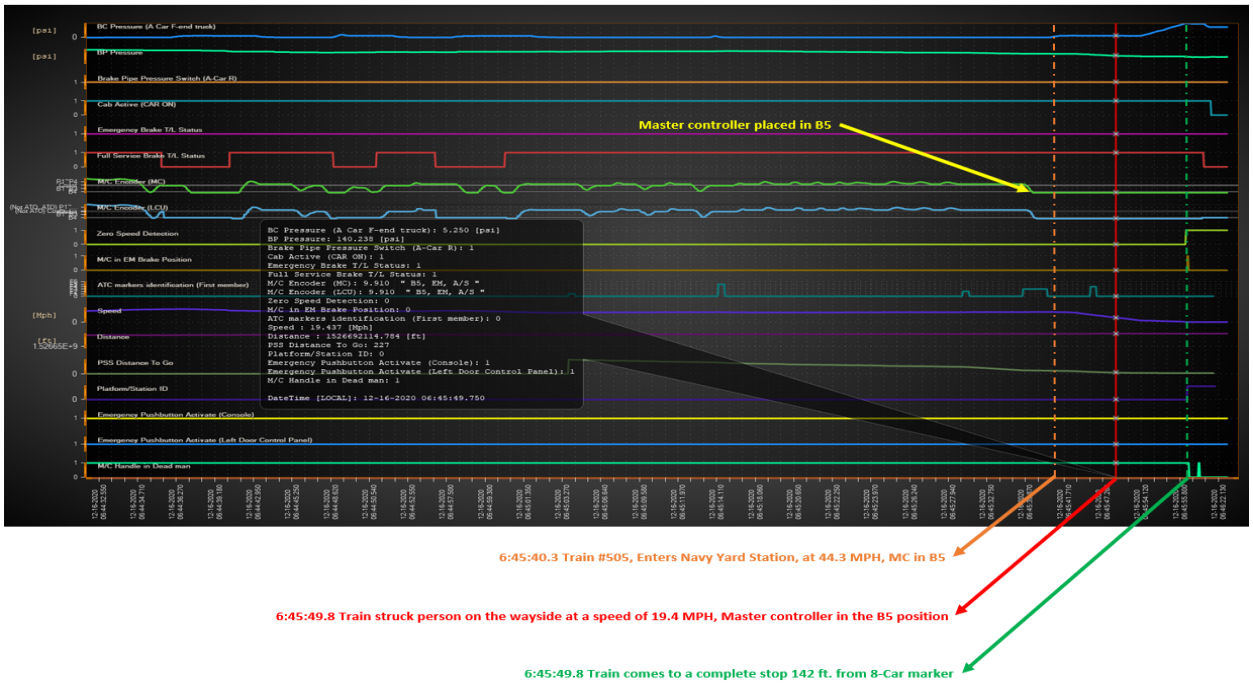


Diagram 1- ER Graphical Analysis

Office of Car Maintenance (CMNT)

CMNT technicians inspected the incident consist for damage and found front lower left cowling damaged on Lead car 7164. CMNT personnel repaired the front-end cowling and painted the affected surface. CMNT technicians performed MC operational checks on the incident consist and did not find any indications of an anomalous condition with the MC. CMNT personnel performed brake rate testing and determined the readings were within acceptable ranges.

Incident Report Findings

Based on the investigation launched into the Navy Yard person struck by train event, SAFE reviewed incident reports via Incident/Accident Safety Measurement System, which included the investigation team and relevant Metro management. These incident reports were reviewed over two days after the event and identified the following key findings associated with this event, as follows:

The Train Operator reported arriving at Navy Yard and saw a unidentified person on the roadway trying to climb back up on the platform. The Train Operator blew the horn and dumped the train.

Findings

- Based on CCTV playback, the person appeared to be disoriented and unsteady on their feet. The person wandered near the edge of the Navy Yard Station platform and subsequently fell to the roadway, losing consciousness for a short period.
- The person attempted to climb back to the platform as Train ID 505 was within the platform limits and was subsequently struck by Lead Car 7164.
- Based on CMOR IIT data analysis, the Train Operator of Train ID 505 did not activate the emergency console pushbutton or place the MC in an emergency state before striking the unidentified person.
- CMNT found Lead car 7164 Front lower left cowling damaged.
- The Train Operator of Train ID 505, Lead Car 7164, MC, placed in the B5 position, traveled at 44.8 mph, 75.2 feet before entering Navy Yard Station, Track 1.
- The Train Operator of Train ID 505, Lead Car 7164, entered Navy Yard Station, Track 1, at 44.3 mph with the MC in the B5 position.
- The Train Operator of Train ID 505 came to a complete stop 142 feet from the 8-car marker.
- Navy Yard Station has a 3.69% incline entering before entering the platform limits.
- The Train Operator was not in compliance with MSRPH Operating Rules 3.91 *"Rail vehicles shall not be operated so as to collide with another vehicle, bumping post, or obstruction. Train Operators shall report any couplings that may have resulted in equipment damage to either the ROCC or the Interlocking Operator. Train Operators shall activate the emergency stop pushbutton (mushroom) any time a train must be stopped to prevent a collision with any object or when the train fails to respond to a call for normal braking from the MC."*
- Based on the post-incident station inspection, SAFE did not identify any slip or trip hazards that may have contributed to this event.

Weather

At the time of the incident, NOAA recorded the temperature at 40° F and cloudy. SAFE has concluded that weather was not a contributing factor in this incident (Weather source: NOAA – Location: Washington, DC.)

Human Factors

Fatigue

The Train Operator's 30-day work schedule leading up to the incident was compliant with WMATA's *Policy/Instruction 10.6/1 Hours of Service Limitations for Prevention of Fatigue* and did not present a significant risk of impairment due to fatigue.

As of the date of this report, SAFE was unable to interview the Train Operator as a result of being out on leave for an undetermined amount of time. Therefore, there is no data to discount there were no personal factors present that would have increased the likelihood of fatigue-related impairment, i.e., no history of sleep issues.

Post-Incident Toxicology Testing

At the time of this incident, RTRA staff removed the Train Operator for post-incident testing. Based on SAFE's review of the Train Operator's test results, the Train Operator was in compliance with WMATA's *Drug and Alcohol Policy and Testing Program Policy Instruction 7.7.3/5.*

Probable Cause Statement

The probable cause of the Navy Yard Station person struck by train event, was a person fell onto the roadway and unintentionally placed themselves in the train's dynamic envelope. As the person attempted to exit the roadway, Train ID 505 consequently struck them.

SAFE Recommendations

There are no recommendations for this event because the person unintentionally placed themselves onto the roadway fouling the train's dynamic envelope.

Appendix A – Incident Statement

RTRA – Train Operator

The Train Operator is a WMATA employee with 13 years of experience as a Train Operator and six years of service in various positions, Bus Operator. The Train Operator record does not reflect any Safety Violations during the last three years. The Train Operator was certified on March 14, 2019 (QL-1).

The Train Operator's 30-day work schedule leading up to the incident was compliant with WMATA's *Policy/Instruction 10.6/1 Hours of Service Limitations for Prevention of Fatigue* and did not present a significant risk of impairment due to fatigue.

As of the date of this report, SAFE was unable to interview the Train Operator as a result of being out on leave for an undetermined amount of time. Therefore, there is no data to discount there were no personal factors present that would have increased the likelihood of fatigue-related impairment, i.e., no history of sleep issues.

Based on the Train Operator's written statement, the Train Operator recounted the following information on the incident:

The Train Operator reported arriving at Navy Yard and saw a white male on the roadway trying to climb back up on the platform. The Train Operator blew the horn and dumped the train. After that, the train made contact with the person on the roadway.