



## **WMSC Commissioner Brief: W-0269 – Red Signal Overrun – Mount Vernon Sq. Station – July 11, 2023**

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

### **Safety event summary:**

A northbound Yellow Line train's speed commands dropped to zero as the train entered Mount Vernon Sq. Station on July 11, 2023, due to a red signal and train movement ahead. The Rail Traffic Controller provided the Train Operator with a permissive block which permitted the Train Operator to enter Stop and Proceed Mode, pull the train up to the end of the platform, and service the station (note: the radio communication did not include required 100% repeat backs by the Train Operator). This was the final stop for this train, as Metrorail now ends all northbound Yellow Line service at Mount Vernon Sq., utilizes the interlocking south of the station or the pocket track north of the station to move the trains to the opposite track, then operates those trains south to Huntington Station.

After the Train Operator offloaded the train at Mount Vernon Square Station on the northbound track, the Train Operator closed the train doors. The train still had zero speed commands, so Metrorail rules required the doors to remain open. The Train Operator then improperly moved the train forward toward the pocket track without speed commands. Metrorail's Stop and Proceed Mode Awareness Tool software does not require the Train Operator to acknowledge movement without speed commands a second time after servicing a station. At the time of the improper movement, the switch was aligned for a straight-through move, not for the intended movement of this train into the pocket track. The Train Operator stopped the train after passing the red signal governing the turnout for the pocket track. The front of the train stopped 12 feet beyond the red signal. The Rail Traffic Controller contacted the Train Operator due to a red signal overrun alarm on the Advanced Information Management (AIM) system display. This red signal overrun detection by the signal system automatically led to the other signals at the interlocking turning red, and the interlocking switching from automatic to manual operation.

Metrorail dispatched personnel to the scene, confirmed that the train had not reached the switch point, clamped the switch, and moved the train to a rail yard for inspection and investigation.

### **Probable Cause:**

The probable cause of this event was the train operator's failure to comply with established procedures for moving without speed commands.

### **Corrective Actions:**

Metrorail directed Rail supervisors to highlight to train operators the importance of rules requiring them to verify a proceed signal, correct rail alignment, and speed commands prior to moving a train.

Metrorail provided additional training to the train operator related to speed commands and rail alignment.

Example of other related open CAPs

- C-0181 addresses the Rail Operations Audit finding that elements of Metrorail have a culture that accepts noncompliance with written operational rules, instructions, and manuals. (Completion of final actionable item scheduled October 2024)



**WMSC staff observations:**

The Train Operator reported that Metrorail had not provided experience operating all types of railcars during initial training. The Train Operator had completed training approximately 6 months prior to this event. The differences among railcars did not directly contribute to this event.

The WMSC continues to oversee Metrorail's safety certification work related to Automatic Train Operation. Metrorail's Automatic Train Operation would not have prevented or reduced the severity of this event. Based on known safety risks, Metrorail is planning to require manual mode operation into and out of pocket tracks. Metrorail would also continue to require manual operation utilizing Stop and Proceed Mode to adjust a train on the platform to properly service a station when the train stops short of the end of the station platform.



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

**FINAL REPORT OF INVESTIGATION A&I E23474**

<b>Date of Event:</b>	July 11, 2023
<b>Type of Event:</b>	O-8: Red Signal Overrun
<b>Incident Time:</b>	06:51 hours
<b>Location:</b>	Mount Vernon Square Station, Track 1
<b>Time and How received by SAFE:</b>	06:56 hours MAC Desk
<b>WMSC Notification Time:</b>	07:26 hours
<b>Responding Safety Officers:</b>	SAFE OSI
<b>Rail Vehicle:</b>	Train ID 307 (L 3052-3053X3046-3047X3094-3095 T)
<b>Injuries:</b>	None
<b>Damage:</b>	None
<b>Emergency Responders:</b>	ATCM, RTRA, ERT
<b>SMS I/A Number</b>	20230711#109841

# Mount Vernon Square Station – Red Signal Overrun

July 11, 2023  
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## **Abbreviations and Acronyms**

<b>AIMS</b>	Advanced Information Management System
<b>ARS</b>	Audio Recording System
<b>ATCM</b>	Automatic Train Control Maintenance
<b>CCTV</b>	Closed-Circuit Television
<b>CM</b>	Chain Marker
<b>CMOR</b>	Office of Chief Mechanical Officer
<b>ER</b>	Event Recorder
<b>ERT</b>	Emergency Response Team
<b>MAC</b>	Mission Assurance Coordinator
<b>MSRPH</b>	Metrorail Safety Rules and Procedures Handbook
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>OSI</b>	Office of Safety Investigations
<b>RTC</b>	Rail Traffic Controller
<b>RTRA</b>	Office of Rail Transportation
<b>ROCC</b>	Rail Operations Control Center
<b>SAFE</b>	Department of Safety
<b>SMS</b>	Safety Measurement System
<b>SPOTS</b>	System Performance On Time System
<b>TRST</b>	Office of Track and Structures
<b>VMS</b>	Vehicle Monitoring System
<b>WMATA</b>	Washington Metropolitan Area Transit Authority
<b>WMSC</b>	Washington Metrorail Safety Commission

**Washington Metropolitan Area Transit Authority  
Department of Safety – Office of Safety Investigations**

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**Executive Summary**

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

On Tuesday, July 11, 2023, at 06:47 hours, Train ID 307, an inbound Yellow line train, entered Mount Vernon Square Station. While entering the station, Train ID 307 lost speed commands, and the Train Operator contacted the Rail Operations Control Center (ROCC) to request a permissive block to the 8-car marker and to initiate Stop And Proceed mode. The Train Operator was given a permissive block to the 8-car marker. The Train Operator serviced the station and then offloaded the train because the train was at its terminus location. Train ID 307 was going to be diverted to the pocket track and pulled back out on track 2 to return to revenue service towards Huntington Station. Prior to closing the doors, the Train Operator failed to ensure the train had speed commands. After closing the doors, they went to a point of power without ensuring they had a lunar signal and proper rail alignment.

As the train started moving, the Train Operator noticed signal E01-26 had a red aspect and stopped the train. By the time the train stopped, it was approximately 12 feet past the signal but short of the switch point. The Radio Rail Traffic Controller (RTC) observed a red signal overrun alarm on their screen and contacted the Train Operator. The Train Operator reported that they were beyond the signal. The Radio RTC notified appropriate personnel and resources were dispatched to the scene. This included personnel from the Office of Rail Transportation (RTRA), Automatic Train Control Maintenance (ATCM), the Emergency Response Team (ERT), and Office of Safety Investigations (OSI).

On arrival, ERT and ATCM entered the roadway to verify conditions were safe for movement, clamped the switch and granted permission to move the train back to the platform on track 1. Afterwards, the train was taken to Alexandria Yard for post-incident inspection.

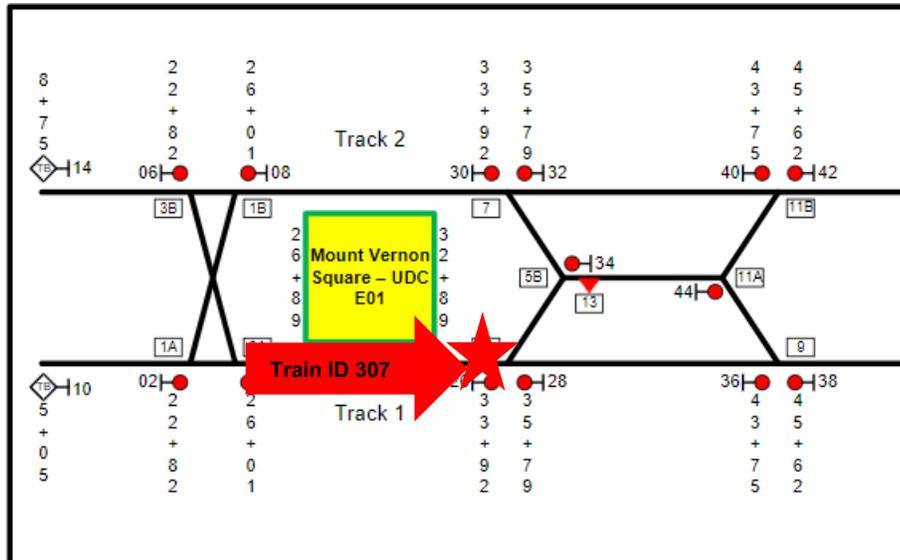
There were no damages or injuries as a result of this incident.

The probable cause for this Red Signal Overrun was that the Train Operator failed to follow established procedures for servicing a station and moving without speed commands. The ineffective functionality of stop and proceed mode was a contributing factor to the event.

**Incident Site**

Indoor station with a center platform and direct fixation tracks. There is a pocket track on the northbound end of the station and interlockings at both ends of the station.

## Field Sketch/Schematics



The above depiction is not to scale.

## 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 document review.
- Formal Interviews – SAFE interviewed two 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 individuals:
  - Train Operator
  - Buttons RTC
- 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)
  - Train Operator's Manifest
  - Train Operator's 30 Work History
  - Train Operator's Training Records
  - Train Operator Certifications

- System Data Recording Review – A collection of information contained in Metro Data Recording Systems. This data includes:
  - Audio Recording System (ARS) playback, including Ops. 3 Radio, Rail 1, Ops. 3 Phone
  - Closed-Circuit Television (CCTV)
  - Advanced Information Management System (AIMS) Playback
  - Oracle Report
  - Vehicle Monitoring System (VMS) Data
  - ROCC System Performance On-Time System (SPOTS) Report

## **Investigation**

On Tuesday, July 11, 2023, at 06:47 hours, Train ID 307, an inbound Yellow line train, entered Mount Vernon Square Station. While entering the station, Train ID 307 lost speed commands, and the Train Operator contacted the ROCC to request a permissive block to the 8-car marker and to initiate stop and proceed mode. The Train Operator was given a permissive block to the 8-car marker. The Train Operator serviced the station and offloaded the train because it was at the end of its scheduled run. Train ID 307 was going to be diverted to the pocket track and pulled back out on track 2 to return to revenue service towards Huntington Station.

During the interview, the Train Operator said the RTCs would usually advise them prior to Mount Vernon Square Station if they were going to cross them over to track 2 prior to entering Mount Vernon Square Station or stay on track 1 and pull into the pocket track after servicing the station. After closing the doors, the Train Operator went to a point of power without ensuring they had a lunar signal, speed readouts, and proper rail alignment. The Train Operator was aware that they were supposed to check their speed commands, lunar signal and make sure they had proper rail alignment. The Train Operator said that when they opened and closed the doors, they thought that canceled stop and proceed mode and they had speed commands. As the Train Operator started moving, they noticed the red signal, immediately stopped, and reported it to the ROCC.

The Train Operator was able to stop the train without fouling the switch point. Switch 5 was misaligned for the intended route and would have taken the train on a straight-through move, instead of the intended diverging route into the pocket track. Signal E01-26 was red on Train ID 307's arrival due to a previous movement of a train into the pocket track, returning on track 2. The Train Operator on track 2 had to clamp the switch so they could proceed with the customers on board.

There were no damages or injuries because of this incident.

The Event Scene Release (ESR) was issued by the WMSC via telephone at 07:01 hours. Personnel from Automatic Train Control Maintenance (ATCM), the Emergency Response Team (ERT), Office of Rail Transportation (RTRA), and Safety's Office of Safety Investigations (OSI) responded to the scene.

ERT and ATCM inspected the signal, switch and associated infrastructure and found no damages or defects. OSI conducted a field interview with the Train Operator and observed the inspection by ERT and ATCM. Once the switch was clamped, the train was moved back to the platform and then dispatched to Alexandria Rail Yard for post-incident inspection.

## Chronological Event Timeline

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

Time	Description
06:49:00 hours	<u>Train ID 307</u> : Contacted the Radio RTC but transmission was cutoff. [Ops. 3]
06:49:09 hours	<u>Radio RTC</u> : Gave Train ID 307 a permissive block to the 8-car marker, track 1, at Mount Vernon Square Station. <u>Train Operator</u> : Did not give a 100% repeat back. [Ops. 3]
06:50:28 hours	<u>Train ID 307</u> serviced the Mount Vernon Square Station. [SPOTS Report]
06:51:07 – 06:52:15 hours	<u>Radio RTC</u> : Contacted Train ID 307 to inquire if they were still properly berthed on the platform. <u>Train ID 307</u> : Responded that they were at the signal. <u>Radio RTC</u> : Asked if they were short of the E01-26 signal red because they were getting an indication that they passed the red signal. <u>Train ID 307</u> : Confirmed they passed the red signal. <u>Radio RTC</u> : Confirmed they copied and instructed them to stand by. [Ops. 3]
06:52:39 hours	<u>Buttons RTC</u> : Contacted MOC to request ATCM report to Mount Vernon Square Station for a red signal overrun. [Ops. 3 Phone]
06:52:59 hours	<u>ROCC Assistant Operations Manager (AOM)</u> : Contacted the ROCC Operations Manager to inform them of the red signal overrun. [Rail 1]
06:57:31 hours	<u>Radio RTC</u> : Granted Train ID 512's Train Operator to exit their train under foul time, to verify the position E01 #7 switch.
06:58:29 hours	<u>Buttons RTC</u> : Contacted MOC Desk again to request ATCM be sent to National Airport for switch 9 because they'll need to turn Yellow Line trains at National Airport. [Ops. 3 Phone]
07:00:00 hours	<u>Train ID 512 Operator</u> : Informed the Radio RTC that switch 7 was in a normal position. <u>Radio RTC</u> : Granted permission to clamp switch 7 for a straight-through move. [Ops. 3]
07:00:07 hours	<u>RTRA Supervisor</u> : Contacted the Buttons RTC and informed them they were en route to Mount Vernon Square Station. [Ops. 3 Phone]
07:00:14 hours	<u>MAC Desk</u> : Contacted the Safety Director On Call (SDOC) and informed them of the red signal overrun at Mount Vernon Square Station. [MAC Phone]
07:01:30 hours	<u>MAC Desk</u> : Contacted the WMSC to inform them of the red signal overrun and was provided the Event Scene Release. [MAC Phone]
07:03:33 hours	<u>On-Call Safety Director</u> : Contacted the MAC desk to ask additional follow-up questions. MAC informed them that the train was already offloaded. [MAC Phone]
07:06:28 hours	<u>AOM</u> : Advised the Operations Manager (OM) they were turning all Yellow Line trains around at L'Enfant Plaza. [Rail 1]
07:17:49 hours	<u>Safety Director On Call</u> : Informed the MAC Desk that SAFE personnel were en route to the scene and gave their contact information. [MAC Phone]
07:24:19 hours	<u>Buttons RTC</u> : Contacted MOC Desk to ask about ATC's arrival time. MOC Desk said they should be there in a few minutes. [Ops. 3 Phone]
07:41:35 hours	<u>ERT Unit</u> : Contacted the Buttons RTC to inform them they were on the scene of Mount Vernon Square Station because they were instructed to check the switch. <u>Buttons RTC</u> : Confirmed it was switch 5 because the AIMS screen was indicating an overrun red signal. <u>ERT Unit</u> : Informed them the train didn't reach the switch. [Ops. 3 Phone]

<b>Time</b>	<b>Description</b>
07:47:42 hours	SAFE arrived on the scene and provided the MAC with their call number. [MAC Phone]
07:58:28 hours	<u>Radio RTC:</u> Asked for the ATC Unit call number located at E-01. <u>ATC Unit:</u> Gave call number and the Radio. [Ops. 3]
08:00:31 hours	<u>ATC Unit:</u> Contacted the Buttons RTC to inform them they were at Mount Vernon Square Station. <u>Buttons RTC:</u> Informed the ATC Unit there was a red signal overrun, and they needed them to check switch 5. [Ops. 3 Phone]
08:01:45 hours	<u>SAFE OSI:</u> Contacted the MAC Desk and talked to Rail 1 Operations Manager about the incident and informed them they did not need to enter the roadway. [MAC Phone]
08:01:47 hours	<u>ERT Unit:</u> Informed the Radio RTC that they would be the RWIC and escort ATC and SAFE personnel to the roadway. [Ops. 3]
08:04:25 hours	<u>Radio RTC:</u> Granted the ERT Unit permission to enter the roadway to escort ATC and SAFE personnel for the purposes of the investigation. [Ops. 3]
08:06:34 hours	<u>ERT Unit:</u> Informed the Radio RTC that the train was not fouling the switch. [Ops. 3]
08:07:23 hours	<u>MAC Desk:</u> Contacted SAFE personnel to ask if they could let them know when Train ID 307 was safe to move so they could let Rail 1 know. [MAC Phone]
08:09:31 hours	<u>SAFE Unit:</u> Informed the MAC Desk Train ID 307 was safe to be moved to the platform and alight to the yard. [MAC Phone]
08:11:46 hours	<u>Buttons RTC:</u> Informed RTRA Supervisor once they had permission to move Train ID 307 they would transport it directly to Alexandria Yard. [Ops. 3 Phone]
08:12:40 hours	<u>ERT Unit:</u> Informed the Radio RTC that ATC Unit clamped 5A & 5B switch, all personnel were standing clear on the platform, and moving the train back to the platform was safe. <u>Radio RTC:</u> Gave a 100% repeat back. [Ops. 3]
08:22:04 hours	Train ID 307 cleared the Mount Vernon Square Station platform. [SPOTS Report]
08:25:51 hours	SAFE cleared the scene. [MAC Phone]

*\*\*Note: Times above may vary from other systems' timelines based on clock settings and reporting sources.*

# Advanced Information Management System (AIMS)

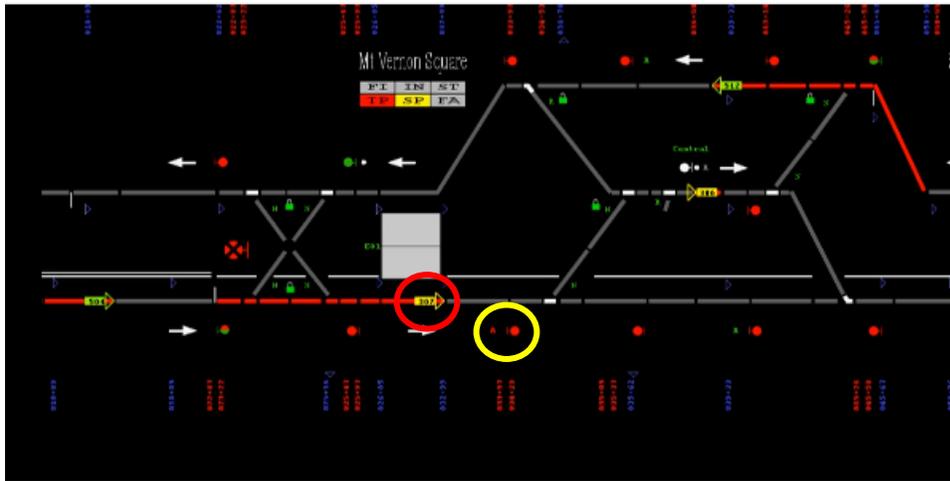


Figure 1: This image shows at 06:48 hours there was a red signal when Train ID 307 arrived at Mt. Vernon Square Station.

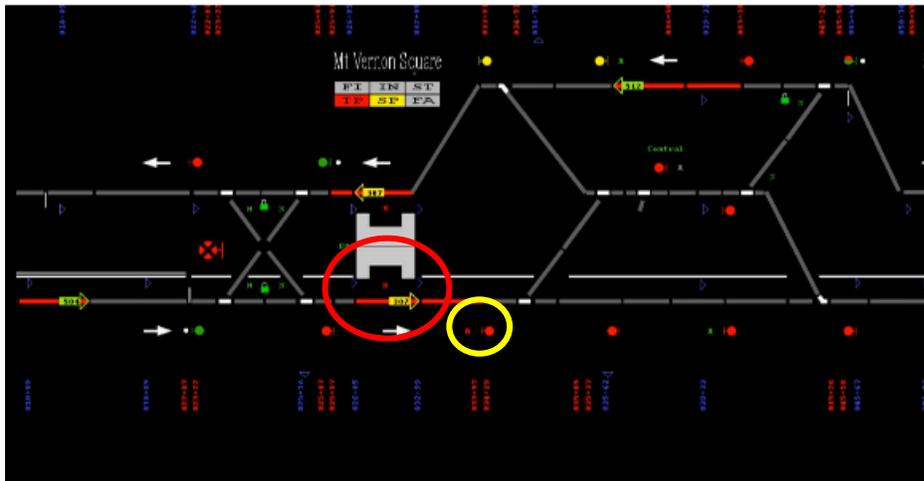


Figure 2: This image shows that at 06:50 hours the signal was still red as Train ID 307 serviced the station.

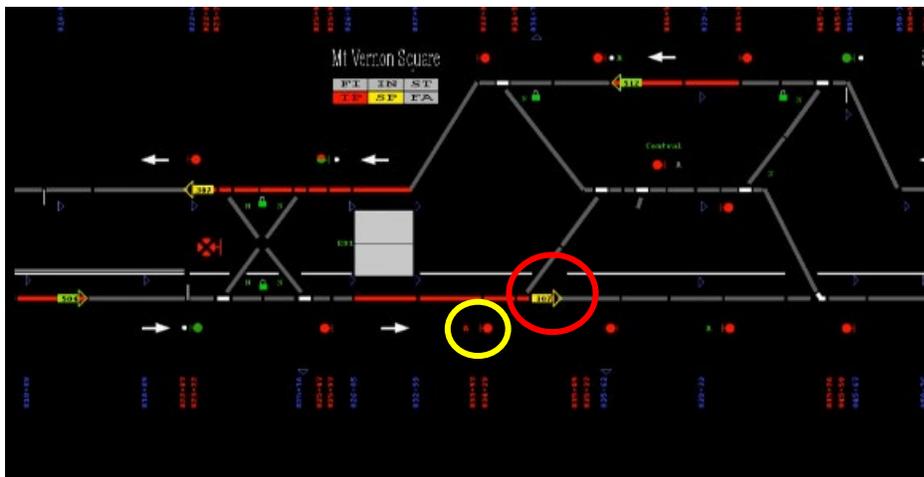


Figure 3: This image shows that at 06:51 hours Train ID 307 departed Mt. Vernon Square Station with a red signal.

## The Office of Chief Mechanical Officer (CMOR) / Vehicle Monitoring System (VMS)

Adopted from CMOR IIT report with minor formatting and grammatical edits:

"IIT completed the analysis of the data retrieved from train 307, cars (L 3052-3053X3046-3047X3094-3095 T), reported to have overrun signal E01-26 (status red) on 7/11/2023 on or about 6:50 at Mount Vernon Square Track #1.

Based on the VMS and ER data, there was no fault with the train that contributed to the cause of this incident. The train performed as designed, responding to the Brake/Power Commands entered through the Master Controller. Please note that speed commands were removed as train 307 approached Mount Vernon Square Station since signal E01-26 was red at the time of the incident. Train 307 stopped due to the loss of speed commands. Later, train 307 was given a permissive block to continue to move and berth the train at the station. Train 307 serviced Mount Vernon Square, doors were closed, master controller was placed on P5 and train moved without speed commands nor a confirmation of a clear block."

See timeline of events below:

Time	Description of Events
6:46:11	Train ID307, lost speed commands and eventually stopped.
6:47:52	Stop and proceed was initiated.
06:47:54	Master Controller was place in P5 and train 307 continued towards Mount Vernon Sq. Station(Central gave a permissive block for this purpose).
06:48:32	Train stopped at Mount Vernon Sq. and service the Station.
06:49:17	Doors were closed, Master Controller was placed in P5 and train 307 started to move without speed commands nor a permissive block.
06:49:27	Overran Red Signal E01-26, switch was place in the normal position and train ended up on track one instead of the spur track.



## SPOTS Report

### ROCS SPOTS REPORT

based on up-to-the-second operational performance data from the Rail Operations Control System  
 Current date/time: Wed Jul 12 12:30:10 2023

Select Platform:  and/or Select ID:  Leave blank to remove criteria  
 and/or Select 4-digit car number:  Leave blank to remove criteria  
 Select Date: Jul 11 2023 Select Times (0-24HRS): From 06:00 To 07:00

Generate Report

ID	Platform	length	dcode	Right door open	Right door close	dwell	Left door open	Left door close	dwell	Head Arrived	Tail cleared	cars	Headway door open to door open
514	E01-1	0	44							06:09:11	06:10:26	6165-6164.6110-6111.6059-6058.6070-6071	-
301	E01-1	8	28				06:12:11	06:12:36	25	06:11:30	06:13:16	7216-7217.7703-7702.7496-7497.7041-7040	-
515	E01-1	6	44				06:16:37	06:16:56	19	06:16:05	06:17:18	6013-6012.6181-6180.6007-6006	4.26
302	E01-1	6	28				06:18:48	06:19:08	20	06:18:15	06:19:38	6137-6136.6161-6160.6098-6099	2.11
501	E01-1	8	44				06:24:59	06:25:25	26	06:24:32	06:25:49	3055-3054.3109-3108.3050-3051.3070-3071	6.11
304	E01-1	8	28				06:31:40	06:32:10	30	06:31:07	06:32:40	7450-7451.7545-7544.7564-7565.7563-7562	6.41
502	E01-1	6	44				06:34:08	06:34:26	18	06:33:35	06:34:47	6126-6127.6081-6080.6060-6061	2.28
305	E01-1	6	28				06:38:12	06:38:40	28	06:37:27	06:39:12	6159-6158.6055-6054.6107-6106	4.04
503	E01-1	8	44				06:41:32	06:41:48	16	06:41:05	06:42:15	3148-3149.3151-3150.3254-3255.3068-3069	3.20
306	E01-1	6	28				06:43:57	06:44:18	21	06:43:19	06:44:53	3177-3176.3031-3030.2043-2042	2.25
707	E01-1	6	99				06:50:05	06:50:27	22	06:47:32	08:22:04	3053-3052.3046-3047.3095-3094	6.08

Figure 4: This report shows when Train ID 307 entered the station.

## Automatic Train Control (ATC)

*Adopted from Oracle Report:*

“Train ID 307 served the E01 station at 06:49:54 (Train Motion not motion with platform track circuit E1-27, and E1-33 occupied), manually opening and closing the doors. Signal 26 was red since 06:46:32. At 06:50:47, track circuit 5AAT indicates occupancy.” [See Appendix C](#)

## Office of Rail Transportation (RTRA)

*Adopted from RTRA report:*

The Train Operator was interviewed by the Division Superintendent, Assistant Superintendent, and RTRA Supervisor. The Train Operator told them they lost speed commands at the middle of the platform, contacted the ROCC for a block to the 8 car marker, and initiated stop and proceed mode. The ROCC gave them permission to move and waited about a minute for the block was given. The Train Operator did not notice a red signal as they entered the station. The Train Operator noticed the red signal after they went to a point of power. As a result of their administrative investigation, the Train Operator received discipline in accordance with the Collective Bargaining Agreement.

## Interview Findings

*As part of the investigation launched into the event, SAFE interviewed two people. 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.*

### Train Operator

- The Train Operator was completing their second roundtrip when the incident occurred.
- They were certified as a Train Operator in February 2023.
- The Train Operator mentioned during training that they never operated a legacy train, only 7000 series trains.<sup>1</sup>
- The Train Operator mentioned there were delays on the Yellow line before their incident.
- The Train Operator reported being unaware of the severity of what they had done.
- The Train Operator said they lost speed commands as they entered the station and entered stop and proceed mode.
- The Train Operator said they had speed commands before departing the platform.<sup>2</sup>
- The Train Operator acknowledged failing to check for a lunar signal and correct rail alignment before departing the platform.
- The Train Operator was unaware they stopped the train before the switch point; they were just focused on stopping the train after noticing the red signal.

### Buttons RTC

- The Buttons RTC said the Train Operator on track 2 at Mount Vernon Square Station, contacted the ROCC stating they had a red signal.
- The Buttons RTC saw an alert on the AIMS screen which prompted them to contact the Train Operator on track 1 to inquire if they overran the red signal.
- The Train Operator on track 1 initially said they did not overrun the signal.

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<sup>1</sup> Stop and Proceed mode functions the same on 7000-series and Legacy Series railcars. The Train Operator was able to initiate Stop and Proceed mode without issue.

<sup>2</sup> VMS Data does not support this statement. It is likely this statement is inaccurate.

- They instructed the Train Operator on track 2 to clamp the switch so they could proceed with the customers on board.
- The Buttons RTC is unaware if or when a Train Operator initiates stop and proceed mode if they do not request permission.

## Weather

On July 11, 2023, at 06:51 hours, NOAA recorded the temperature as 73.4° F, with clear skies, winds 7 mph, and 64.76% humidity. This occurred at an indoor station, so the weather was not contributing to this incident. (Weather source: NOAA) – Washington, DC.

## Related Rules and Procedures

MSRPH 6.31; Before initiating the Car's close door button, the Train Operator shall check the operating console for speed commands and check the roadway ahead of the train to ensure it is clear.

MSRPH 3.79: Train Operator shall not move trains with zero speed commands except after notifying ROCC or Terminal Supervisor and being given permission to move with zero speed commands and either a permissive block going with traffic or an absolute block going against traffic.

MSRPH 3.79.1: Upon losing speed commands on the platform, the operator may not adjust the train in the same direction of traffic to service the station without contacting ROCC or Terminal Supervisor for permission. After servicing the station, the operator must keep their train doors open, until such time when the operator has received speed commands, a proper signal aspect (Lunar or Flashing Lunar), along with contacting ROCC or Terminal Supervisor for permission to leave and an absolute block for the move if speed commands do not return.

GR 1.5: Failure to comply with the rules and procedures contained in this manual, in other operating manuals, in notices, and given by verbal instruction of supervisors is considered sufficient cause for discipline.

## Human Factors

### Fatigue

#### *Signs and Symptoms 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 Train Operator reported feeling fully alert at the time of the incident. The Train Operator 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 Train Operator reported keeping a regular sleep schedule in the days leading up to the incident. The Train Operator worked the day shift in the days leading up to the incident. The Train Operator was awake for 4.85 hours at the time of the incident. The Train Operator reported 7 hours of sleep in the 24 hours preceding the incident. The off-duty period was 14.95 hours, providing an opportunity

for 7-9 hours of sleep. This was more a comparable amount of sleep as the Train Operator's usual workday sleep durations. The Train Operator reported no issues with sleep.

### Post-Incident Toxicology Testing

WMATA's Drug and Alcohol Program determined that the Train Operator complied with the Drug and Alcohol Policy and Testing Program 7.7.3/6.

### Findings

- There were no mechanical issues found with Train ID 307.
- Train ID 307 lost speed commands as it entered Mount Vernon Square Station.
- The Train Operator closed platform doors and moved the train without speed commands, passing E01-26 signal.
- The RTC observed an alarm on their AIMS screen that a red signal was overrun and contacted the Train Operator.
- Train ID 307 did not foul the switch point. Train ID 307 was supposed to be entering the pocket track at the time of the incident, but the switch was still aligned for a straight-through move.

### Immediate Mitigation to Prevent Recurrence

- RTRA Management issued an RTRA Supervisor Notification to conduct discussions with Operators about the red signal overrun incident and the importance of verifying a lunar signal, correct rail alignment, and speed commands.
- The Train Operator was removed from service for post-incident testing according to SOP 102-01 section 6.1.5.1.6.
- Train ID 307 was removed from revenue service according to CMOR OAP 102.06 and transported directly to Alexandria Yard for VMS downloads.
- A return to Automatic Train Operations (ATO) will be an effective mitigation against Red Signal Overruns of this nature.

### Probable Cause Statement

The probable cause for this Red Signal Overrun was that the Train Operator failed to follow established procedures for servicing a station and moving without speed commands. The ineffective functionality of stop and proceed mode was a contributing factor to the event.

### Recommended Corrective Actions

<b>Corrective Action Code</b>	<b>Description</b>	<b>Responsible Party</b>	<b>Estimated Completion Date</b>
109841_SAFE CAPS_RTRA_ 001	Train Operator to complete retraining focusing on speed commands and proper rail alignment.	RTRA	Completed

## Appendices

### **Appendix A – Interview Summaries**

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

#### Train Operator

The Train Operator is a WMATA employee with twenty (20) years of experience, but less than a year as a Train Operator. The Train Operator previously worked as a Bus Operator. The Train Operator is RWP Level 2 certified and must recertify in August 2023. The Train Operator mentioned feeling fully alert while operating their train. The Train Operator stated there were no non-work-related circumstances affecting their opportunity to get good sleep. The Train Operator did not experience any mechanical issues while operating Train ID 307. The Train Operator was completing their second round trip when this event occurred.

The Train Operator was working their regular run on the day of the incident. During the interview, the Train Operator stated there were residual delays that morning on the Yellow line. The Train Operator stated they were concerned that they were not trained on all series of trains during training. When they did have training on the legacy trains, it was only to identify different parts, but they never operated the legacy trains during training. The trainers varied throughout their training. The Train Operator said if they are running on time, the RTC would typically bring them in on track 1 and then divert them into the pocket track. They mentioned that if they were running late, the RTCs would cross them over to track 2 before entering Mount Vernon Square. They mentioned that the RTC normally tells the Train Operators the gameplan before arriving at Mount Vernon Square Station, which did not happen when they were approaching Mount Vernon Square.

The Train Operator said that as they were entering Mount Vernon Square Station, they lost speed commands because a train coming out of the pocket track had their drop-back Train Operator on it. Once the train came out of the pocket track and berthed at the 8-car marker, the RTC gave them a permissive block to the 8-car marker. They went to the 8-car marker and offloaded their train because they were at the end of the line. The Train Operator said that after they closed the doors, sat back down, saw speed commands, and went to a point of power without verifying a lunar signal and proper rail alignments. Once they went to a point a power and started moving, they noticed the red signal and immediately stopped. The RTC contacted them and asked if they overran a red signal. The Train Operator confirmed they did pass the red signal.

#### Buttons RTC

The Buttons RTC is a WMATA employee with twenty-five (25) years of experience, with eight (8) years as a Rail Traffic Controller. The Buttons RTC previously worked as a Train Operator and Rail Supervisor. The Buttons RTC is RWP Level 4 certified and must recertify in August 2023—the Buttons RTC mentioned feeling fully alert the morning of the incident. The Buttons RTC stated that no non-work-related circumstances affected their opportunity to get good sleep.

The Buttons RTC said their role and responsibilities included strategizing on managing their line, setting signals, setting up protections, answering the telephone, as well as taking notes. The Buttons RTC said they always work as a pair, but there are some times when they have to work alone. The Buttons RTC said, “When the Operator on the opposite track stated they didn’t have a lunar and had a red signal, they saw a train and the signal was shunted. The Train Operator initially said they did not run the red signal. When the Train Operator shunted the red signal, it caused the train on the adjacent track to lose their lunar as a safety feature. They had the Train

Operator on track 2 clamp the switch so they could proceed with the customers on board. The Buttons RTC said they follow a checklist to help manage red signal incidents. The Buttons RTC said there is no one set procedure when bringing a train into Mt. Vernon Square Station when it is a terminus station, it all depends on the situation. The Buttons RTC said they are unaware if a Train Operator uses stop and proceed mode unless they request permission.

## Appendix B – Photographs



Figure 5: This image was taken from the passenger compartment of the lead car. It shows E01-26 signal.

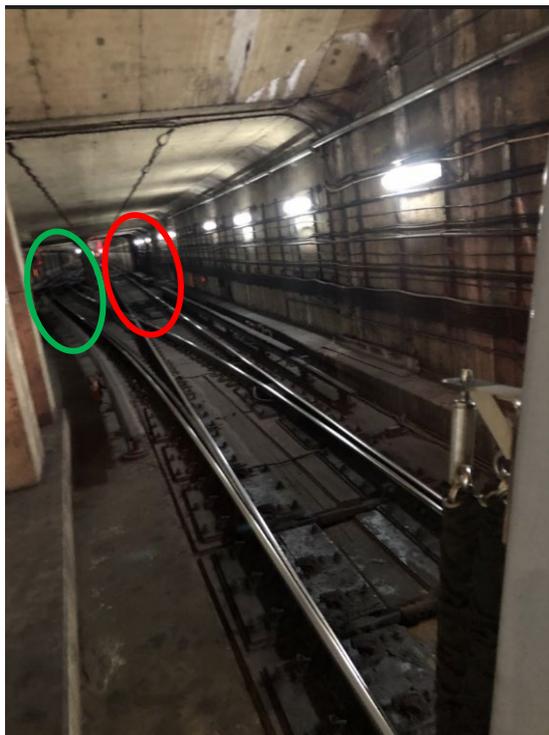


Figure 6: The green circle is where the Train Operator was supposed to go, and the red circle shows where the train was aligned for before it stopped.



Figure 7: This image shows the switch point from the Operator's cab bulkhead door.



Figure 8: This image shows the train stopped before the switch point of switch 5A.

# Appendix C – Oracle Report

	<b>Washington Metropolitan Area</b> <b>Transit Authority</b> <b>ENGA-ATCE</b>			Request: [REDACTED]				
	Date 07/17/2023							
	From [REDACTED]							
	To: [REDACTED]							
Location: E01		Time of incident: 06: 50		Date of incident: 07/11/23		Train ID:307		
Discription: Train ID 307 passed E01-26 signal red. track 1				Control of interlocking: Central				
Initial state as of: 06: 15: 00								
Name	State	Auto	Name	State	Auto	Name	State	Auto
5AAT	Vacant	----	E1-27	Vacant	----	5A	Unlocked	----
Signal 26	Stop	----	E1-33	Vacant	----	5B	Unlocked	----
5T	Vacant	----	E1-27	Vacant	----	Approach 26	Unlocked	----
Recorded Event Data:								
Time	Location	Status/Control	AIMS DESCRIPTION			Comments		
06:16:22	E01	Status	Train Number Input 1:301, 304, 305			From 06:16:22 to 06:42:03 300 series Train ID successfully serviced the platform and entered/ exit the pocket track at E01		
06:42:03	E01	Status						
06:16:22	E01	Status	Number Input 1: 515, 501, 502, 503			From 06:16:22 to 06:42:03 500 series Train ID successfully serviced the platform and departed to Sha-Howard U (E02)		
06:42:03	E01	Status						
06:42:42	E01	Status	Signal Train Destination 26-34 On			ROCC set the route signal 26 to 34. Switch 5 in reverse and switch 7 in Normal and Signal 26 is flashing lunar (for a cross over Track 1 to track 3)		
06:42:50	E01	Status	Switch Position 5 Reverse					
06:42:50	E01	Status	Switch Position 7 Normal					
06:42:51	E01	Status	Signal State 26 Clear					
06:42:51	E01	Status	Approach 26 Locked					
06:42:51	E01	Control	Signal 26 Inhibit Automatic Operation Set					
06:43:17	E01	Status	Track Circuit E1-27 Occupied			Train ID 306 is arriving at E01 platform and send his information to the Station through TWC		
06:43:35	E01	Status	Train Number Input 1 306					
06:43:35	E01	Status	Track 1 PSS Received			Train ID 306 is at E01 platform and successfully served E01		
06:43:46	E01	Status	Track Circuit E1-33 Occupied					
06:43:52	E01	Status	Track 1 Train Motion Not Motion					
06:44:18	E01	Status	Track 1 Door Close Both Sides					
06:44:32	E01	Status	Track Circuit 5AAT Occupied					

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Recorded Event Data:				
06:44:32	E01	Status	Track Traffic Direction 1N Normal	Train ID 306 moves from track 1 to track 3 (signal 26 to signal 34) Train 306 occupies pocket track <b>signal 26 is now RED</b>
06:44:32	E01	Status	Signal State 26 Stop	
06:44:32	E01	Status	Signal Train Destination 26-34 No	
06:44:35	E01	Status	Track Circuit 5T Occupied	
06:44:45	E01	Status	Track Circuit E3-37 Occupied	
06:44:46	E01	Status	Approach 26 Unlocked	
06:44:58	E01	Status	Track Circuit E1-33 Vacant	Track circuits at E01 platform (E1-27 and E1-33) are unoccupied <b>Signal 26 is RED</b>
06:45:02	E01	Status	Track Circuit 5AAT Vacant	
06:48:37	E01	Status	Signal 34 Request Route Request Route	
06:48:39	E01	Status	Signal Entrance 34 Received	ROCC sets route 34 to 30 (crossing over from Track 3 to track 2). Switches 5 and 7 are aligned to complete the request
06:48:40	E01	Control	Signal 30 Request Route Request Route	
06:48:48	E01	Status	Switch Position 5 Normal	
06:48:48	E01	Status	Switch Position 7 Reverse	
06:48:49	E01	Status	Signal State 34 Clear	Train ID 306 has a lunar at Signal 34 for a cross over move 34 to 30, track 3 to track 2
06:49:07	E01	Status	Track Circuit 5BT Occupied	
06:49:07	E01	Status	Signal State 34 Stop	
06:49:12	E01	Status	Track Circuit 7AAT Occupied	
06:49:24	E01	Status	Track Circuit E2-33 Occupied	
06:49:25	E01	Status	Approach 34 Unlocked	
06:49:31	E01	Status	Track Circuit E3-37 Vacant	Train ID 306 cleared the pocket track (track 3 is unoccupied)
06:47:29	E01	Control	Track Circuit E1-26 Occupied	Train ID 307 arrives at E01 platform and send his information to the Station through TWC
06:47:31	E01	Status	Track Circuit E1-27 Occupied	
06:49:36	E01	Status	Train Number Input 1 307	
06:49:36	E01	Status	Track 1 PSS Received	
06:49:36	E01	Status	Train Destination Code Input 1 28	
06:49:36	E01	Status	Train Length Input 1 6	
06:49:36	E01	Status	Train Motion Motion	
06:49:39	E01	Status	Route Lock Track 1 Unlocked	
06:49:37	E01	Status	Circuit 5BT Vacant	Train ID 306 clears the turn out and it is at the platform E01 track 2
06:49:42	E01	Status	Circuit 7AAT Vacant	
06:49:48	E01	Status	Track Circuit E2-33 Vacant	
06:49:49	E01	Status	Track Circuit E1-33 Occupied	Train ID 307 successfully services E01
06:49:54	E01	Status	Train Motion Not Motion	
06:50:03	E01	Status	Door Opening Mode Manual	
06:50:27	E01	Status	Door Close Both Sides	

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06:50:16	E01	Status	Signal 30 Request Route Request Route	
06:50:19	E01	Status	Switch Call 7 Call Normal	Switch 7 is called Normal, signal 26 still RED
06:50:25	E01	Status	Switch Position 7 Normal	
06:50:26	E01	Status	Route Lock Track 7 Locked	
06:50:42	E01	Status	Train Number Input 1 0	Train ID 307 departs E01 Platform in approach to signal 26. Signal 26 RED. Switch 5 Normal position
06:50:42	E01	Status	Train Destination Code Input 1 0	
06:50:42	E01	Status	Train Length Input 1 0	
06:50:47	E01	Status	Track Circuit 5AAT Occupied	Train 307 enters the interlocking Track 5AAT is occupied with Signal 26 RED
06:57:32	E01	Control	Signal 26 Set Auto Route Cancel Auto Ro	
06:57:32	E01	Status	Signal Automatic Routing 26 Automatic	
06:57:34	E01	Status	Signal Automatic Routing 26 Manual	
06:57:35	E01	Control	Signal 26 Inhibit Automatic Operation Cancel	
06:57:42	E01	Control	Signal 26 Set Auto Route Off	
08:15:31	E01	Status	Track Circuit 5AAT Vacant	When Train ID 307 departs incident area

**Alarm Status**

Circuit Power Failure: Yes  No  Processor Failure: Yes  No  Power Transfer: Yes  No

**CONCLUSION:**

- Train ID 307 served the E01 station at 06:49:54 (Train Motion Not Motion with Platform track circuit E1-27, and E1-33 occupied), manually opening and closing the doors. Signal 26 was red since 06:46:32. At 06:50:47, track circuit 5AAT indicates occupancy.

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# Appendix D – RTRA Report



## WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

INVESTIGATION REPORT		DIVISION Alexandria	GARAGE N/A	FILE NO.	
DATE OF OCCURRENCE July 11, 2023	TIME 6:52AM	VEHICLE NO. 3053-3046-3095	RUN # AX-24	SHIFT AM	BLOCK NO. 307
LINE Yellow	LOCATION Mt. Vernon Square 7 <sup>th</sup> St.-Convention Center		DESTINATION Mt. Vernon Square 7 <sup>th</sup> St.-Convention Center		
TYPE OF CASE MSRPH 1.3, 1.5, 3.67, 3.70, 3.79			REPORTED BY ROCC		
NAME OF EMPLOYEE INVOLVED [REDACTED]			EMPLOYEE NO. [REDACTED]		
NATURE OF OCCURRENCE Red Signal Overrun					
1. SUMMARY OF INVESTIGATION 2. EMPLOYEE STATEMENT 3. SUMMARY OF VIOLATIONS 4. ANALYSIS OF FACTS/EVIDENCE IN SUPPORT OF RULE VIOLATION 5. ASSESSMENT OF DISCIPLINE					
<p>1. On Tuesday July 11, 2023, Train Operator [REDACTED] worked run AX-24 on the Yellow Line. While in approach to Mt. Vernon Square 7<sup>th</sup> St.-Convention Center station track 1 she lost speed commands. She contacted ROCC to obtain a block to the platform and permission to enter stop and proceed mode to properly berth the train and service the station. Upon servicing the station, she continued without speed commands and overran red signal E01-26 with no damage to the switch or train. ROCC was contacted and confirmed that the overrun had occurred. She was removed from service and transported for post incident testing.</p> <p>2. Operator [REDACTED] in your incident report you stated, "My Train #307 entered the platform at Mt. Vernon Sq. didn't have speed commands at the beginning of platform. Called Central for a block to 8 car marker, got my block did stop and proceed and moved to the 8 car marker. Serviced the station opened the doors waited for my drop back to board. Look back for commands and closed the doors and sat in seat moved my train up to signal which I noticed was red went into brake mode and dumped the train passed the signal. Central called me to verify I had passed the signal and verify that I had passed signal E01 26 red."</p>					
ACTION TAKEN		10-DAY Suspension / Final Warning			
DATE: 7/20/2023	ACTION TAKEN BY: [REDACTED]		TITLE: Assistant Superintendent		
EMPLOYEE SIGNATURE [REDACTED]					
I certify that the above has been called to my attention, and I understand that my signature does not imply admission of guilt					
EMPLOYEE MAY WRITE A STATEMENT IN THIS SPACE Use Vacation For July 24, 25, 26 and July 31, August 1 and 2nd. 2023.					

4.21 (6/79)  
Green: Employee Division File

Orig: Office of Bus Service (BUSV) or RAIL  
Pink: Union

Yellow: Employee  
Gold: Marketing/MARK

068 00 0736 RI

Incident Date: 07/11/2023 Time: 06:51 hours  
Final Report – Red Signal Overrun Rev.1  
E23474

Drafted By: SAFE 703 – 09/01/2023  
Reviewed By: SAFE 704 – 09/08/2023  
Approved By: SAFE 71 – 09/15/2023

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY  
Investigation Report Continuation Sheet

3. Ms. [REDACTED] this incident has been investigated and the following rules and procedures were violated:

**GR 1.3:** Acceptance of employment signifies the individual's willingness to comply with all WMATA rules, regulations and orders; and to perform specific job duties and requirements in a safe, orderly and efficient manner.

**GR 1.5:** Failure to comply with the rules and procedures contained in this manual, in other operating manuals, in notices, and given by verbal instruction of supervisors is considered sufficient cause for discipline.

**OR 3.67:** Rail vehicles shall not be operated past or closer than 10 feet in approach of an interlocking signal or lamp displaying a red aspect, a red flag, or a dark interlocking signal, except at a bump post or entering a pocket track, or unless authorized by ROCC or the Interlocking Operator and the move is consistent with customer safety as specified in Rule 3.1.

**OR 3.70:** When there is a conflict between any groups of conflicting signals (fixed, cab, speed readouts, flagging, portable), operators shall be governed by the most restrictive indication, and shall immediately inform ROCC of the conflict.

**OR 3.79:** Train Operators shall not move trains with zero speed commands except after notifying ROCC and being given permission to move with zero speed commands and an absolute block for the move.

4. Ms. [REDACTED] based on your incident report, supervisor reports, ROCC Reports/Summaries, VDMS download, and AIMS Data it was determined that you did in fact operate your train through a red signal without authorization. Ms. [REDACTED] it is your responsibility as a train operator to pay full time and attention when performing your duties. When approaching a signal displaying a red aspect, a red flag or dark interlocking signal, rail vehicles shall not be operated closer than ten feet of the signal.

See the timeline of events below:

Time	Description of Events
6:46:11	Train ID307, lost speed commands and eventually stopped.
6:47:52	Stop and proceed was initiated.
06:47:54	Master Controller was place in P5 and train 307 continued towards Mt. Vernon Sq. Station(Central gave a permissive block for this purpose).
06:48:32	Train stopped at Mt. Vernon Sq. and service the Station.
06:49:17	Doors were closed, Master Controller was placed in P5 and train 307 started to move without speed commands nor a permissive block.
06:49:27	Overran Red Signal E01-26, switch was place in the normal position and train ended up on track one instead of the spur track.

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY  
Investigation Report Continuation Sheet

5. Ms. [REDACTED] in considering the appropriate discipline for this violation, WMATA has considered many factors. A review of your performance record reflects that you have been employed with WMATA since June 18, 2003, and a train operator, since February 5, 2023. Your performance record indicates you had zero (0) incidents and zero (0) DAP points within the past two (2) years of this incident. As a result of this Red Signal Overrun violation, you are suspended for 10 working days. Your suspension dates are as follows: July 21<sup>st</sup>, 24<sup>th</sup>, 25<sup>th</sup>, 26<sup>th</sup>, 27<sup>th</sup>, 28<sup>th</sup>, 31<sup>st</sup>, August 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup>, 2023. You will return to work on Friday August 4<sup>th</sup>, 2023. You will be scheduled for refresher training with ROQT upon your return to work. You are hereby informed that future violations of any nature will result in progressive discipline which may include termination from the Washington Metropolitan Area Transit Authority.

The action taken is specific to the circumstance surrounding this incident and does not set a precedent for other incidents of this nature.

The results of your post-incident medical test were negative.

Ms. [REDACTED] you are advised that should you elect to use earned vacation leave to protect your earning levels to the extent possible, such voluntary election will preclude you from filing a grievance pursuant to Section 104 (A&B) as it pertains to the violation finding and disciplinary actions taken.

Voluntary election to use earned leave Yes  or No  (Indicate Choice) and initial SPW

EMPLOYEE NAME

[REDACTED]

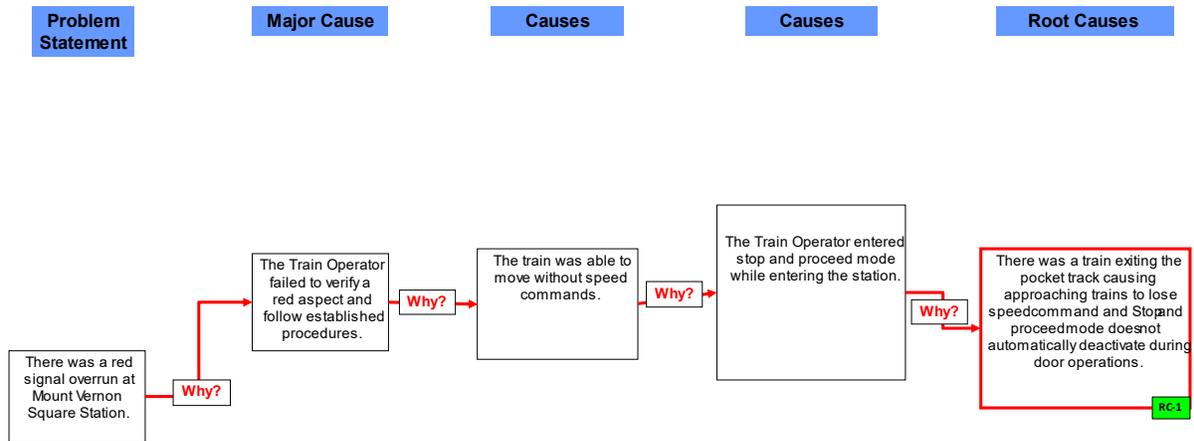
EMPLOYEE #

[REDACTED]

DATE:

7/20/2023

## Appendix E – Why-Tree Analysis



## Root Cause Analysis

