



## Red Signal Overruns

At or Near Ronald Reagan Washington National Airport Station, West Falls Church Yard and Spring Hill Station

July 23, 2023 – November 19, 2023 – November 25, 2023

### Document Purpose:

*This WMSC written report on WMATA Metrorail's safety event investigations and review of Metrorail's findings in accordance with the WMSC Program Standard, in conjunction with the attached Metrorail investigation reports that have undergone WMSC staff review and, if necessary, feedback and revision, describes the investigation activities, identifies factors causing or contributing to the safety events, and sets forth ongoing, additional, or upcoming corrective actions and further oversight work (such as inspections and audits) as necessary or appropriate. The WMSC's ongoing oversight during the investigative process, including safety event reporting and verification, participation in investigative interviews, data review, consistent communication with the Metrorail investigations team, and feedback on Metrorail's reports leads to further improvements prior to consideration of the reports by WMSC Commissioners for adoption. The WMSC's safety event investigation oversight assures the sufficiency and thoroughness of Metrorail's investigations. The WMSC Commissioners are considering these documents (the WMSC review and Metrorail's investigation reports) as a unified item for adoption at the Washington Metrorail Safety Commission meeting on August 6, 2024.*

*WMSC staff recommend adoption of these investigations.*

### Red Signal Overrun

In 2023, Metrorail reported nine red signal overruns. This included events involving passenger trains and events involving maintenance vehicles.

As of July 19, 2024, there have been 11 such events reported in 2024. Due to this concerning safety data trend, the WMSC is considering further action and has increased discussions with Metrorail personnel and data review, including the WMSC's review and monitoring that identified a red signal overrun involving a passenger train near the Brentwood Rail Yard on July 16, 2024 that would not otherwise have been reported to the WMSC and investigated to identify opportunities to reduce the risk of recurrence.

Each train operator involved in the red signal overrun events detailed below had been an operator for less than one year. Some events considered in other reports involved operators with more experience.

The causes of and contributing factors to the events described in more detail below include:

- Inadequate training, including Metrorail's lack of physical characteristics and territory familiarization and qualification requirements
- Inadequate training and certification practices to ensure that each train operator understands and applies the safety requirements that must be met in order to safely pass a red signal, including the necessary permission and communication
- Inadequate design of engineering controls intended to reduce the risk of red signal overruns and other unauthorized movement, specifically the Stop and Proceed Mode (Mode Awareness Tool) continuing to authorize movement after other operational actions such as door operation



- Inadequate communications practices including incomplete instructions and repeat backs
- Poor radio communications transmission quality
- Loss of situational awareness
- Non-compliance with written operational rules and procedures

As a result of these investigations, Metrorail implemented corrective actions including:

- Metrorail conducted a Red Signal Overrun Campaign of focused communications with train operators
- Metrorail's Office of Rail Transportation increased quality check audits and spot checks
- Metrorail enacted the 60-day cycle of the "30/60/90 New Operator Evaluations" to focus on situational awareness during unusual situations on the mainline.
- Metrorail is seeking resources to build and implement a Point and Call defensive ops program.
- Metrorail required personnel to receive reinstruction and refresher training
- Metrorail is reviewing how it communicates in its rules the importance of the repeat back of radio transmissions
- Metrorail instructed interlocking operators to be specific when providing instructions to operators regarding the road crossing near the West Falls Church Yard administrative building, and to ensure 100% repeat back.
- Metrorail replaced the lights in the relevant signal
- Metrorail's Department of Safety is also providing oversight on the following:
  - Skill Survey of Train Operations
  - Train Operator Course Audit
  - Dropped Speed Command Data Audit
  - Rail Operations and Radio Communications

Metrorail is in the process of implementing related corrective action plans (CAPs) including:

- C-0181 addresses the finding that elements of Metrorail have a culture that accepts noncompliance with written operational rules, instruction, and manuals (Scheduled completion October 2024).
- C-0183 addresses the finding that Metrorail creates safety risks by not requiring and conducting territory familiarization and physical characteristics training, and not assessing knowledge of physical characteristics prior to assigning operations personnel work on a line, in a terminal or in a yard (Scheduled completion September 2025).
- C-0268 addresses the finding that Metrorail is not performing its train operator certification activities reliably and consistently in accordance with its safety requirements specified in its Agency Safety Plan and the associated Performance Standardization on Program Manual. Therefore, Metrorail is not ensuring that its trains are only operated by personnel who have demonstrated the skills required to do so safely (Scheduled CAP completion March 2026, interim steps required by the WMSC's February 2024 Train Operator Certification Order were implemented between March and July 2024)
- C-0269 addresses the finding that Metrorail is not conducting retraining of personnel who do not pass certification exams as required by its Performance Standardization Program Manual, and is not consistently retesting these personnel as specified in its safety procedures. (Scheduled CAP completion December 2025, interim steps



required by the WMSC's February 2024 Train Operator Certification Order were implemented between March and July 2024)

The WMSC and Metrorail's Safety Department continue to discuss with Railcar Engineering the opportunity to improve engineering controls, such as Stop and Proceed Mode on existing railcars or the next generation of railcars, the 8000 Series, so that it resets after actions such as door operation or key up/key down if feasible. Metrorail designed Stop and Proceed Mode (Mode Awareness Tool) to ensure that operators acknowledged that they would be moving a train with zero speed commands prior to doing so, as this is only allowed with specific permission from the control point due to the risk of collision or derailment.

Metrorail is conducting safety certification work that may lead to the use of Automatic Train Operation in specific circumstances. Metrorail's draft concept of operations specifies multiple scenarios where manual mode will continue to be required as the safest mode of operation, such as single-tracking, in pocket tracks, outside of passenger service, when work crews are on the roadway, in low-adhesion conditions such as inclement weather, when moving in rail yards or between rail yards and terminals, and in other conditions to reduce the risk of collisions, red signal overruns, and other safety events.

#### **Safety event summaries:**

##### **W-0306 – Ronald Reagan Washington National Airport Station – July 23, 2023 (WMATA ID: E23514)**

A Train Operator moved Yellow Line Train 304 past a red signal located just after the Ronald Reagan Washington National Airport Station Platform on track 1 without authorization.

During the event, another train was experiencing a mechanical issue and was stopped outside Potomac Yard Station on track 2. Due to this train with passengers stopped between stations, the Radio Rail Traffic Controller provided instructions to multiple other train operators, including the operators of Trains 304 and 308, as they approached National Airport Station.

Prior to the red signal overrun, the Train Operator of Train 304 requested a permissive block to the station from a Rail Traffic Controller, after receiving zero speed commands. The Rail Traffic Controller granted the permissive block to the 8-car marker at the end of the station platform (permission to proceed in a specific section of clear track ahead of the train to a specific limit). The train operator activated Stop and Proceed Mode and properly berthed the train and serviced the station. The train operator then closed the doors and moved the train past the red signal toward a switch that was not aligned for this train's movement.

Metrorail policy requires operators to keep their doors open on the platform after servicing a station until they receive speed commands and a lunar (proceed) signal. Stop and Proceed Mode (also referred to as the Mode Awareness Tool) is a Metrorail engineering control intended as a mitigation for the risk of unauthorized movement without speed commands. It does not require a train operator to acknowledge again that they are moving without speed commands after opening or closing doors.

The Train Operator again contacted the Rail Traffic Controller to report zero speed commands but did not report that they had improperly passed the red signal until questioned by the Rail Traffic Controller. The Rail Traffic Controller



instructed the Train Operator to offload riders from the train with the assistance of a Station Manager. The train's trailing car was still on the platform.

Automatic Train Control Maintenance personnel responded and determined there was no damage to the switch.

**W-0307 – West Falls Church Rail Yard – November 19, 2023 (WMATA ID: E23838)**

A Train Operator moved an out-of-service 8-car train past a red (stop) signal in the West Falls Church Rail Yard. The Train Operator and the Interlocking Operator did not report this improper movement as required.

The red signal overrun occurred at 9:12 a.m. The Interlocking Operator reported the event to the Metro Integrated Command and Communications Center (MICC) at 10:41 a.m. Metrorail procedures specify that red signal overruns are emergencies that are to be treated as derailments due to red signals protecting against improper movement through switches and potential collisions. This includes requirements for reporting and response, and requirements to not move the train until inspections are completed to ensure such movement is safe.

The Interlocking Operator had instructed the Train Operator to move two cars to a storage track, couple with six cars on that track, then move the eight-car train to a road crossing near the Train Operators Administration Building. The Train Operator passed that location without permission, exceeding the limits of the absolute block provided by the interlocking operator. In an investigative interview, the Train Operator said they believed the block was provided to a different roadway crossing in the yard. In a separate interview, the Interlocking Operator confirmed that the Train Operator stated after passing the red signal that they had understood the block to be to a different road crossing.

The Train Operator continued on and passed signal K99-302 which was red, moved through two switches, one of which was not aligned for this movement, then told the Interlocking Operator that they were at signal K99-134 which was red. The Interlocking Operator instructed the Train Operator to hold at that location, but provided a lunar (proceed) signal at K99-134.

The Interlocking Operator exited the tower (control point location) and walked to the train. In an investigative interview, the Train Operator reported that the Interlocking Operator informed them that they overran a red signal. Neither the Interlocking Operator nor Train Operator reported this event immediately or ensured the train was kept in place as required by Metrorail procedure.

The Interlocking Operator directed the Train Operator to move the train forward to the next signal, then move to the trailing end of the train. The Interlocking Operator instructed the Train Operator to move the train to Track 10.

At 9:29 a.m., the Interlocking Operator requested Automatic Train Control Maintenance respond to the yard for a dark signal at K99-302. The Interlocking Operator later took a break, and reported the red signal overrun when they returned from their break at 10:41 a.m.

Forward-facing video and on-site investigation following the event show that the lighting conditions and condition of the signal at K99-302 made it difficult for the Train Operator to see the red indication. Metrorail procedures require dark signals to be treated as red signals.

ATC maintenance attempted to pull records of control actions in the yard, but could not. ATC Engineering reported that there was a Server Synchronization error between the servers for the rail yard that are intended to be redundant. A



fault occurred on November 15, 2023, four days before this event, that was not addressed until the day after this event when an ATC Engineer contacted Rail Comm to resolve the issue. Data for that period was lost. The records for this investigation were obtained through other Metrorail data sources.

Metrorail certified this train Operator in January 2023. In March, the Train Operator was operating a train that overran a station, and the Train Operator was involved in a Roadway Worker Protection safety event. In April, the Train Operator was involved in a red signal [overrun](#) and unauthorized movement with Automatic Train Protection cut out. Following this event, Metrorail disqualified the operator from train operations.

### **W-0308 – Spring Hill Station – November 25, 2023 (WMATA ID: E23847)**

A Train Operator moved Train 613 past a red signal near Spring Hill Station without authorization, leading to a near-miss of a head-on collision with a train moving in the opposite direction.

The Silver Line train moving in the opposite direction, Train 607, was within a few hundred feet of the train that overran the red signal. The oncoming train, also in passenger service, was approaching the interlocking with a route from Track 2 to Track 1 as Train 613 entered the interlocking continuing in a straight-through move on Track 2 toward the oncoming train. The distance between the signals at either side of the interlocking on Track 2 is 401 feet. The Train Operator of Train 607 reported that the signal turned red, and that they observed Train 613 having passed the signal on the same track.

Trains were single-tracking between Wiehle-Reston East and Spring Hill stations using Track 2 due to personnel conducting weekend concrete tie replacement work on Track 1.

The Radio Rail Traffic Controller provided the Train Operator with a permissive block to no closer than 10 feet of signal N04-08, which is the first signal beyond the station platform. The signal just under 800 feet from the station platform governs access from Track 2 to the interlocking area. The signal was red due to a train approaching from the opposite direction that would cross over to Track 1 at the interlocking.

The Train Operator had previously entered stop and proceed mode, acknowledging movement without speed commands, in order to berth the train at Spring Hill Station. After servicing the station, this mode that overrides zero speed commands remained active.

The repeat back from the Train Operator is unclear in recorded radio communications. The volume is low. The Train Operator later stated in an investigative interview that they believed the Controller had provided a permissive block to the next station. The Controller did not identify the discrepancy or request that the Train Operator repeat their communication to confirm the instruction was understood.

The Train Operator operated the train toward Wiehle-Reston East Station, stopping briefly before the red signal. The Train Operator then moved the train past the red signal. The Train Operator stopped the train 32 feet beyond the signal. Neither operator reported this as an emergency.

A red signal alarm in the Advanced Information Management (AIM) system led the Rail Traffic Controller to ask the Train Operator if they had passed the red signal. The Train Operator confirmed that they had.



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A Rail Supervisor was on board the train, and assisted with moving the 52 riders to the rear of the train to walk through a second train that was brought in so that riders could reach the platform without entering the roadway.

The train Operator was certified as a Train Operator approximately three months before this safety event. It was the Train Operator's first day operating west of Court House Station (their first day operating on the Silver Line tracks between Court House and Ashburn stations).



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

**FINAL REPORT OF INVESTIGATION A&I E23514**

<b>Date of Event:</b>	July 23, 2023
<b>Type of Event:</b>	Red Signal Overrun
<b>Incident Time:</b>	13:35 Hours
<b>Location:</b>	National Airport, track 1 – Signal C10-36
<b>Time and How received by SAFE:</b>	13:40 Hours – SAFE/MAC
<b>WMSC Notification Time:</b>	14:27 Hours
<b>Responding Safety Officers:</b>	Office of Safety Oversight (OSO)
<b>Rail Vehicle:</b>	Train ID 304 L7586-7587x7727-7726x7676-7677x7705-7704T
<b>Injuries:</b>	None
<b>Damage:</b>	None
<b>Emergency Responders:</b>	None
<b>SMS I/A Number</b>	20230723#110141MX

# National Airport Station – Red Signal Overrun

July 23, 2023

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## **Abbreviations and Acronyms**

<b>ADU</b>	Aspect Display Unit
<b>AIMS</b>	Advanced Information Management System
<b>AOM</b>	Assistant Operations Manager
<b>ARS</b>	Audio Recording System
<b>ATCM</b>	Automatic Train Control Maintenance
<b>ATP</b>	Automatic Train Protection
<b>CCTV</b>	Closed-Circuit Television
<b>COMR</b>	Office of Radio Communications
<b>CMOR</b>	Office of Chief Mechanical Officer
<b>IIT</b>	Incident Investigation Team
<b>MOC</b>	Maintenance Operations Center
<b>MSRPH</b>	Metrorail Safety Rules and Procedures Handbook
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>OAP</b>	Operations Administrative Policy
<b>ROCC</b>	Rail Operations Control Center
<b>ROIC</b>	Rail Operations Information Center
<b>RTC</b>	Rail Traffic Controller
<b>RTRA</b>	Office of Rail Transportation
<b>SAFE</b>	Department of Safety
<b>SOP</b>	Standard Operating Procedure
<b>SMS</b>	Safety Measurement System
<b>SPOTS</b>	System Performance On-Time Summary
<b>VMDS</b>	Vehicle Monitoring and Diagnostics 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 Sunday, July 23, 2023, at 13:32 hours, the Train Operator of Train ID 304 (L7586-7587x7727-7726x7676-7677x7705-7704T) contacted the Rail Operations Control Center (ROCC) Radio Rail Traffic Controller (RTC) and requested a permissive block to National Airport Station, track 1 due to a loss of speed commands. The Radio RTC granted the permissive block to the eight-car marker. After the train was properly berthed, the Train Operator serviced the station. At 13:35 hours, the Train Operator closed the platform-side doors and moved the train past C10-36 signal, displaying a red aspect. After passing the red signal, they reported to ROCC that the train was not displaying speed commands.

The Radio RTC inquired if Train ID 304 was still on the platform of track 1 at National Airport Station and if the Train Operator had moved past the signal. The Train Operator confirmed that the train had passed the signal. The Radio RTC confirmed with the Train Operator that the trailing rail cars were still on the platform.

The Button RTC contacted the Maintenance Operations Center (MOC) and requested that an Office of Automatic Train Control Maintenance (ATCM) mechanic respond to National Airport Station. The Button RTC notified the Rail Operations Information Center (ROIC) and requested the Station Manager at National Airport Station assist with offloading the train. The ROCC Assistant Operations Manager (AOM) was also advised of the event.

In adherence to Standard Operating Procedure (SOP) 102-1, which outlines the protocol for Removing an Employee from Service for involvement in an operational safety event, the Radio RTC dispatched a Rail Supervisor to relieve the Train Operator from duty for post-incident testing.

At 14:42 hours, ATCM personnel arrived and confirmed that the train had not entered the switch point and reported no damage to the switches. The switches were re-aligned to a normal position, and then the train was able to move towards Crystal City Station.

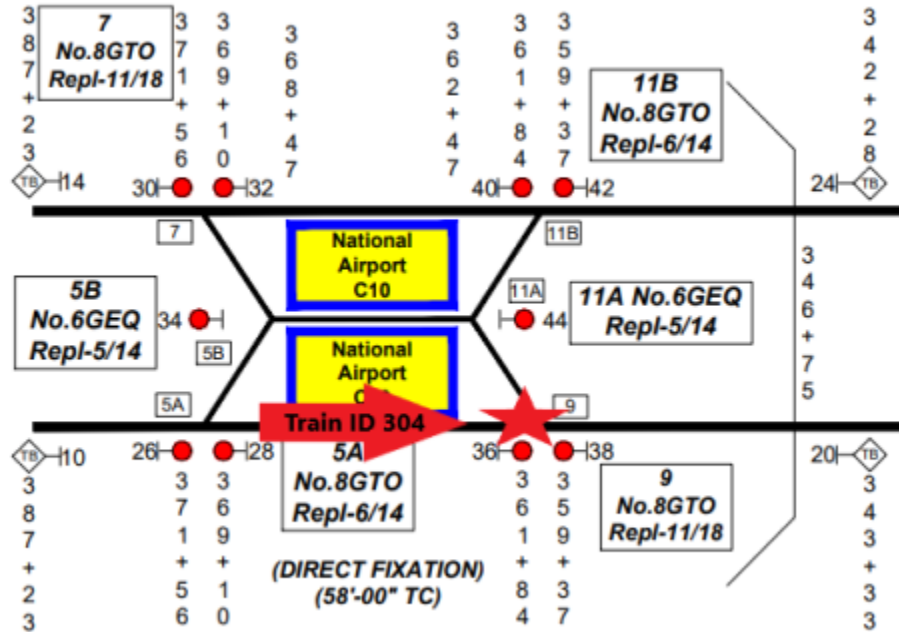
In accordance with the Office of the Chief Mechanical Officer (CMOR) Incident Investigation Team (IIT) Operations Administrative Policy (OAP) 102.06, the Rail Operations Control Center (ROCC) promptly initiated the removal of Train ID 304 from revenue service for post-incident investigative measures. This action adhered to the Rail Vehicle Event Investigation Policy, ensuring a comprehensive examination of the incident.

The probable cause of the Red Signal Overrun event on July 23, 2023, at National Airport Station, was a failure to adhere to established procedures by the Train Operator (e.g., verifying presence of speed commands and lunar signal), who acknowledged not paying attention before moving the train past the red signal. Contributing factors to the event were a human factors failure of complacency and an inadequate safeguard with the Stop and Proceed software. In addition, the Radio RTC did not advise the Train Operator that the signal ahead was red signal.

**Incident Site**

National Airport Station, track 1 – Signal C10-36

## 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:

- Physical Site Assessment
- 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 individual:
  - Train Operator (Train ID 304)
  - Radio RTC
- Documentation Review – Collection of relevant work history information and process documentation contained in WMATA systems of record. These records include:
  - Train Operator Training Records
  - Train Operator Certifications
  - Train Operator 30-Day work history review
  - Metrorail Safety Rules and Procedures Handbook (MSRPH)
  - National Oceanic and Atmospheric Administration (NOAA)
  - Rail Operations Control Center (ROCC) Incident Report

- Maximo Data
- System Data Recording Review – Collection of information contained in Metro Data Recording Systems. This data includes:
  - Audio Recording System (ARS) playback
  - The Office of Chief Mechanical Officer (CMOR) Incident Investigation Team (IIT) Vehicle Monitoring and Diagnostic System (VMDS)
  - System Performance On-Time Summary (SPOTS)
  - Closed-Circuit Television (CCTV)

## **Investigation**

On Sunday, July 23, 2023, at 13:32 hours, the Train Operator of Train ID 304 contacted the Radio RTC and requested a permissive block to National Airport Station, track 1. The Radio RTC granted the permissive block. After the train arrived on the platform at National Airport Station, the Train Operator serviced the station. After servicing the station, the Train Operator proceeded to move the train past C10-36 signal displaying a red aspect, then stopped the train.



*Image 1 – Train ID 304’s Forward-Facing Camera showing the train passing C10-36 signal with a red aspect.*

The Audio Recording System (ARS) revealed that prior to the Red Signal Overrun event, at 12:51 hours, the Train Operator on Train ID 306 reported the train was disabled outside of Potomac Yard Station on track 2.

The System Performance On-Time Summary (SPOTS) revealed that at 13:06 hours, Train ID 304 departed Huntington Station on track 1.

During the emergency event involving the disabled train (Train ID 306), at 13:21 hours, the Radio RTC instructed Train ID 308, which was located at Crystal City on track 2, to continue and terminate at National Airport Station, track 3, then reverse ends facing signal C10-44.

At 13:32 hours, Train ID 304 located on track 1, at National Airport and requested a permissive block to the 8-car marker<sup>1</sup>. The Radio RTC granted a permissive block to the 8-car marker, and then instructed Train ID 308 to close and continue and to verify a lunar at signal C10-44, but the operator of Train ID 308 did not respond.

The Advanced Information Management System (AIMS) revealed that Train ID 304 arrived at National Airport at 13:33 hours, and at 13:35 hours, the Train Operator moved the train past C10-36 signal, displaying a red aspect<sup>2</sup>.



Figure 1 - AIMS Playback of Train ID 304 overrunning C10-36 signal red at National Airport Station at 13:35 hours. Train ID 308 departed National Airport pocket signal at C10-44 crossing over from Track 3 to Track 1.

Train ID 304 reported servicing the National Airport Station and that the train was not displaying speed commands. The Radio RTC inquired if Train ID 308 was ready to move from National Airport, Train ID 308 responded that the train was still located on track 3 at National Airport Station.

At 13:36 hours, the Radio RTC inquired if Train ID 304 was still on the platform of track 1 at National Airport Station and if the Train Operator had moved past the signal. The Train Operator confirmed that the train had passed the signal.

At 13:37 hours, the Button RTC contacted MOC and requested ATCM to respond to National Airport Station. At 13:38 hours, the Button RTC contacted ROIC and advised them of the event. The Radio RTC confirmed with the Train Operator that the trailing rail cars were still on the platform. ROIC contacted the Station Manager at National Airport Station and instructed to assist with offloading the train by keying off the customers.

At 13:41 hours, the Radio RTC instructed Train ID 308 to reverse ends and continue to Huntington Station.

<sup>1</sup> At this point, the Train Operator was requesting to enter Stop and Proceed Mode. Stop and Proceed mode enables Train Operators to take a point of power in the absence of speed commands, with the ATP System enforcing a maximum speed of up to 15 MPH. If speed commands are lost on the mainline, and the consist comes to a stop with the ADU displaying the code number, the Operator must contact ROCC to obtain either a Permissive or Absolute block before pressing the corresponding number on the ADU Touchpad to enter Stop and Proceed Mode.

<sup>2</sup> The Train Operator failed to adhere to MRSPH Section 3 OR – 3.79 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 for permission to leave and an absolute block for the move if speed readouts do not return. However, the Train Operator was able to move the train since the Stop and Proceed Mode was initiated before servicing the platform. Because the Train Operator did not exceed 15mph when moving to the eight-car marker, Stop and Proceed mode remained active.

At 13:55 hours, the Radio RTC on Ops 2 instructed a Rail Supervisor to report to National Airport Station.

At 14:42 hours, ATCM personnel advised that they were located at National Airport Station. The Radio RTC instructed the ATCM mechanic to inspect switch 9 and advise if the train could move toward Huntington Station.

At 14:45 hours, the Rail Supervisor advised that they were located at National Airport Station.

At 14:49 hours, the ATCM mechanic reported that switch 9 was in a reverse position, the train did not pass the switch point, and the train was stopped at CM C1 360+00. At 14:52 hours, the Radio RTC granted foul time to the ATCM mechanic to crank and clamp switch 9 in a normal position. The ATCM mechanic advised that switch 9 was cranked and clamped in a normal position, and the Radio RTC instructed them to stand by in a place of safety. The ATCM mechanic relinquished foul time.

At 14:53 hours, the Radio RTC instructed the Rail Supervisor to take over operating Train ID 304 and granted a permissive block to Crystal City Station, passing red signal C10-36 and verifying switch 9 was clamped normal. The Rail Supervisor acknowledged and repeated the instructions.

At 14:59 hours, the Radio RTC requested the ATCM mechanic to restore switch 9 to correspondence and granted foul time to unclamp and reset switch 9. The ATCM mechanic acknowledged the instructions.

At 15:01 hours, the Radio RTC granted a permissive block to Train ID 304 (704) to Pentagon City Station, track 1, and reverse ends.

At 15:02 hours, the ATCM mechanic requested that ROCC throw switch 9 in a normal and reverse position to confirm that the switch was in correspondence. At 15:04 hours, the Radio RTC confirmed that switch 9 was showing in correspondence.

At 15:06 hours, the ATCM mechanic advised that switch 9 was back in service and relinquished foul time.

At 15:09 hours, the Radio RTC instructed Train ID 304 (704) to continue to Alexandria Yard. At 15:29 hours, Train ID 304 (704) arrived at Alexandria Yard and was stored on track 10.

CMOR/IIT completed an analysis of data retrieved from Train ID 304, and determined that based on the ER, VMDS, and NVR video, there was no fault with the train that contributed to the Red Signal Overrun.

The train's recorded data identified that at 13:34:26 hours, Train ID 304 departed National Airport Station in the direction of Crystal City Station without speed commands. After the train serviced National Airport Station, the master controller was placed in the P5 power position and the train began to move inbound. The train passed the red signal C10-36 and interlocking switch 11A at a speed of 13.4 MPH after traveling 62 feet and came to a stop 166 feet beyond C10-36.

During the formal interview, the Train Operator reported that The Train Operator stated that they felt moderately alert and anxious before the event. The Train Operator stated that they overheard their coworker sounding upset at Potomac Yard, and ROCC was not responding timely in their view. The Train Operator stated they just wanted to get down the line so they wouldn't feel

overwhelmed. The Train Operator stated that after servicing National Airport Station, they closed the doors and proceeded to move the train.

The Train Operator stated that they probably were not paying attention because they do the same thing every day on the same line, and they assumed that they had a lunar. The Train Operator stated they did not know they overran the signal until they contacted ROCC to report no speed commands.

On July 23, 2023, RTRA issued a Supervisor Notification that required the Rail Supervisors to discuss the event with the Train Operators and review the importance of verifying a lunar signal, correct rail alignment, and speed commands before moving the train.

### Chronological Event Timeline

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

Time	Description
12:51:05 hours	Train ID 306 reported a disabled train outside of Potomac Yard Station on track 2. [Radio Ops 3]
13:06:42 hours	Train ID 304 departed Huntington Station on track 1. [Spots]
13:21:49 hours	<u>Radio RTC</u> : Instructed Train ID 308 located at Crystal City on track 2 to continue and terminate at National Airport Station, track 3, then reverse ends facing signal C10-44. <u>Train ID 308</u> : Acknowledged and repeated. [Radio Ops 3]
13:32:40 hours	<u>Train ID 304</u> : Reported located at National Airport and requested a permissive block to the 8-car marker. <u>Radio RTC</u> : Acknowledged and granted a permissive block to the 8-car marker. [Radio Ops 3]
13:32:48 hours	<u>Radio RTC</u> : Instructed Train ID 308 to close and continue and to verify a lunar at signal C10-44. <u>Train ID 308</u> : No response. [Radio Ops 3]
13:33:00 hours	Train ID 304 arrived at National Airport Station. [AIMS]
13:35:00 hours	Train ID 304 passed C10-36 signal red. [AIMS]
13:35:42 hours	<u>Train ID 304</u> : Reported they just serviced National Airport Station and had no speed commands. <u>Radio RTC</u> : Inquired if Train ID 308 was ready to move. <u>Train ID 308</u> : Responded that they were located in the pocket track at National Airport. [Radio Ops 3]
13:36:13 hours	<u>Radio RTC</u> : Inquired if Train ID 308 was still on the platform. <u>Train ID 304</u> : Reported they just serviced National Airport, and had no speed commands. <u>Radio RTC</u> : Inquired if Train ID 304 was still on the platform track 1 and if the Train Operator moved past the signal. <u>Train ID 304</u> : Reported they were passed the signal. [Radio Ops 3]
13:37:00 hours	<u>Radio RTC</u> : Inquired if Train ID 304 moved past the signal. <u>Train ID 304</u> : Confirmed they passed the signal. [Radio Ops 3]
13:37:07 hours	<u>ROCC Button RTC</u> : Contacted MOC and requested ATCM to respond to National Airport Station. [Phone Ops 3]
13:38:03 hours	<u>ROCC Button RTC</u> : Contacted ROIC and advised of the incident at National Airport Station. [Phone Ops 3]

<b>Time</b>	<b>Description</b>
13:38:10 hours	<u>Radio RTC</u> : Inquired if Train ID 308 was still on the platform. <u>Train ID 308</u> : Confirmed still on the platform. <u>Radio RTC</u> : Acknowledged and inquired if Train ID 304 had any cars remaining on the platform. <u>Train ID 304</u> : Confirmed that cars were still on the platform. <u>Radio RTC</u> : Inquired if Train ID 304 had all cars on the platform. <u>Train ID 304</u> : Responded located at the switch, and speed readouts dropped. [Radio Ops 3]
13:38:46 hours	<u>ROIC Controller</u> : Contacted the Station Manager at National Airport Station and instructed to assist with offloading the train by keying off the customers. [Phone ROIC PA]
13:41:42 hours	<u>Radio RTC</u> : Instructed Train ID 308 to reverse ends to continue to Huntington Station. <u>Train ID 308</u> : Acknowledged and repeated. [Radio Ops 3]
13:49:29 hours	<u>Radio RTC</u> : Instructed Train ID 308 to close and continue and to verify a lunar at signal C10-34. <u>Train ID 308</u> : Acknowledged and repeated. [Radio Ops 3]
13:55:11 hours	<u>Radio RTC</u> : Instructed a Rail Supervisor to report to National Airport Station. [Radio Ops 2]
14:42:24 hours	<u>ATCM</u> : Reported located at National Airport Station. <u>Radio RTC</u> : Instructed to inspect switch 9 and advise if the train could move towards Huntington. <u>ATCM</u> : Acknowledged and repeated. [Radio Ops 3]
14:45:39 hours	<u>Rail Supervisor</u> : Reported located at National Airport Station. <u>Radio RTC</u> : Acknowledged and repeated. [Radio Ops 3]
14:49:09 hours	<u>ATCM</u> : Reported switch 9 in a reverse position. <u>Radio RTC</u> : Inquired if the train passed the switch point. <u>ATCM</u> : Responded the train did not pass the switch point and the train was stopped at CM C1 360+00. [Radio Ops 3]
14:52:13 hours	<u>Radio RTC</u> : Advised that switch 9 would need to be cranked and clamped in a normal position. <u>ATCM</u> : Acknowledged and repeated. <u>Radio RTC</u> : Granted foul time to crank and clamp switch 9. <u>ATCM</u> : Acknowledged and repeated. [Radio Ops 3]
14:52:58 hours	<u>ATCM</u> : Advised that switch 9 was cranked and clamped in a normal position. <u>Radio RTC</u> : Acknowledged and repeated. Instructed to stand by in a place of safety. <u>ATCM</u> : Acknowledged and relinquished foul time. [Radio Ops 3]
14:53:41 hours	<u>Radio RTC</u> : Instructed the Rail Supervisor to take over operating Train ID 304 and granted permission to pass C10-36 red and verify that switch 9 was clamped normal, permissive block to Crystal City. <u>Rail Supervisor</u> : Acknowledged and repeated. [Radio Ops 3]
14:59:16 hours	<u>Radio RTC</u> : Instructed to enter the ATC Room to restore switch 9. <u>ATCM</u> : Acknowledged and repeated. Requested permission to unclamp and reset switch 9. <u>Radio RTC</u> : Granted foul time to unclamp and reset switch 9. <u>ATCM</u> : Acknowledged and repeated. [Radio Ops 3]
15:01:42 hours	<u>Radio RTC</u> : Provided a permissive block to Train ID 304 (704) to Pentagon City, track 1, and reverse ends. <u>Train ID 304 (704)</u> : Acknowledged and repeated. [Radio Ops 3]



Time	Description
15:02:09 hours	<u>ATCM</u> : Requested to throw switch 9 in a normal and reverse position. <u>Radio RTC</u> : Instructed to stand by and stand clear. [Radio Ops 3]
15:03:07 hours	<u>Radio RTC</u> : Advised switch 9 was showing in correspondence in normal. <u>ATCM</u> : Acknowledged and repeated. [Radio Ops 3]
15:04:19 hours	<u>Radio RTC</u> : Advised switch 9 was showing in correspondence in reverse. <u>ATCM</u> : Acknowledged and repeated. [Radio Ops 3]
15:06:11 hours	<u>ATCM</u> : Reported that switch 9 was back in service and relinquished foul time. [Radio Ops 3]
15:09:19 hours	<u>Radio RTC</u> : Instructed Train ID 304 (704) to continue to Alexandria Yard. [Radio Ops 3]
15:29:54 hours	Train ID 304 (704) arrived at Alexandria Yard and was secured on track 10. [Radio AL YD1]

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

### The Office of Chief Mechanical Officer (CMOR/IIT) / Vehicle Monitoring and Diagnostic System (VMDS)

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

CMOR/IIT completed an analysis of data retrieved from Train ID 304, which was involved in a Red Signal Overrun.

Based on the ER, VMDS, and NVR video, there was no fault with the train that contributed to the Red Signal Overrun. The train performed as designed.

At 13:34:26 hours, Train ID 304 departed National Airport Station in the direction of Crystal City Station without speed commands. After the train serviced National Airport Station, the master controller was placed in the P5 power position, the train began to move inbound. The train passed the red signal C10-36 and interlocking switch 11A at a speed of 13.4 MPH after traveling 62 feet and came to a stop 166 feet beyond C10-36.

#### Timeline Of Events :

Time	Description of Events	Train Speed	Master Controller	Regulated Speed	Limiting Speed	Distance from C10 8 <sup>TH</sup> car marker.
13:32:19.8	Train ID 304, with Lead Car 7704 entered National Airport platform limits, on Track# 1, at speed 18 Mph.	18 MPH	Coast	22 MPH	22 MPH	599 ft.
13:32:23.1	Train speed commands dropped to 0 Mph, 519 feet before reaching the 8 <sup>th</sup> car marker.	14.37 MPH	B1-B3	0 MPH	0 MPH	519 ft.
13:32:30.0	Train came to a complete stop 459 feet from 8 <sup>th</sup> car marker. Master Controller paced in B4.	0 MPH	B4	0 MPH	0 MPH	458 ft.
13:32:57.7	Master Controller is placed in the P5 Power position, train entered Stop and Proceed mode and began to move without receiving speed commands.	0.32 MPH	P5	0 MPH	1 MPH	457 ft.
13:33:08.1	Train reached center of the platform with speed 14 Mph; the master controller moved to Coast.	14.31 MPH	Coast	0 MPH	1 MPH	298 ft.
13:33:31.4	Train came to a complete stop at National Airport's 8 <sup>th</sup> car marker. Master controller placed at B5.	0 MPH	B5	0 MPH	1 MPH	0 ft.
13:34:26.0	Train entered Stop and Proceed again and began to move without receiving speed commands. The Master Controller placed in P5.	0.24 MPH	P5	0 MPH	1 MPH	0 ft.
13:34:30.9	Train passed <b>RED signal C10-36</b> at speed 13.4 Mph; Master controller placed in P5 power position.	13.4 MPH	P5	0 MPH	1 MPH	-62 ft.
13:34:35.8	Train passed interlocking <b>switch 11A</b> at speed 14.5 Mph; Master controller placed in B4 braking position.	14.5 MPH	B4	0 MPH	0 MPH	-155 ft.
13:34:43.0	Train came to a complete stop 235 feet after National Airport's 8 <sup>th</sup> car marker. Master controller placed at B5.	0 MPH	B5	0 MPH	0 MPH	-235 ft.
14:26:34.6	Lead car 7704 keyed down.	14 MPH	P2	50 MPH	0 MPH	0 MPH

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

Incident Date: 07/23/2023 Time: 13:35 hours  
Final Report – Red Signal Overrun  
E23514

Drafted By: SAFE 707 – 09/19/2023  
Reviewed By: SAFE 706 – 06/04/2024  
Approved By: SAFE 71 – 09/21/2023

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**R7704 ER Graph:**

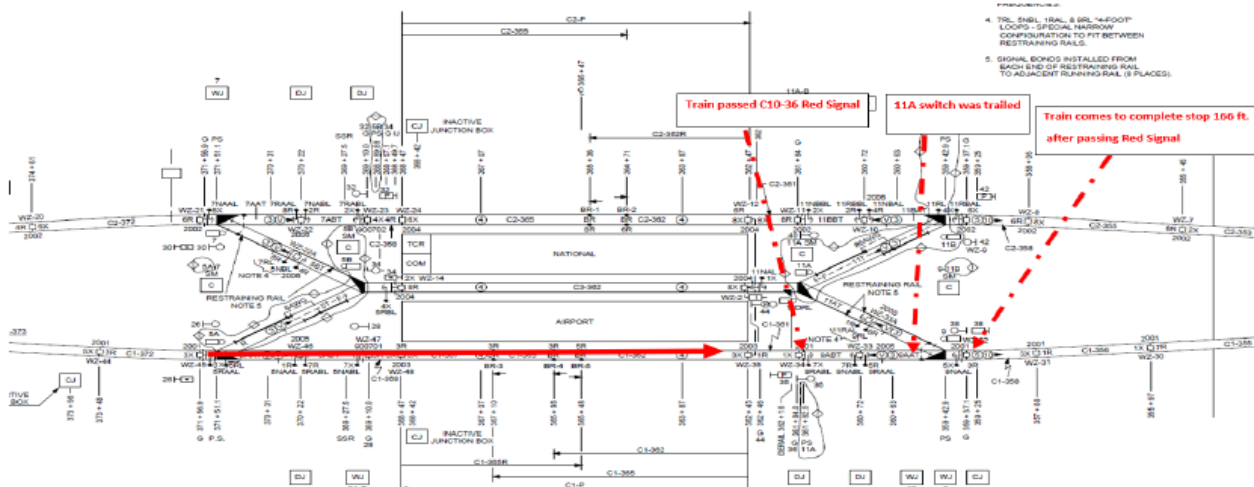
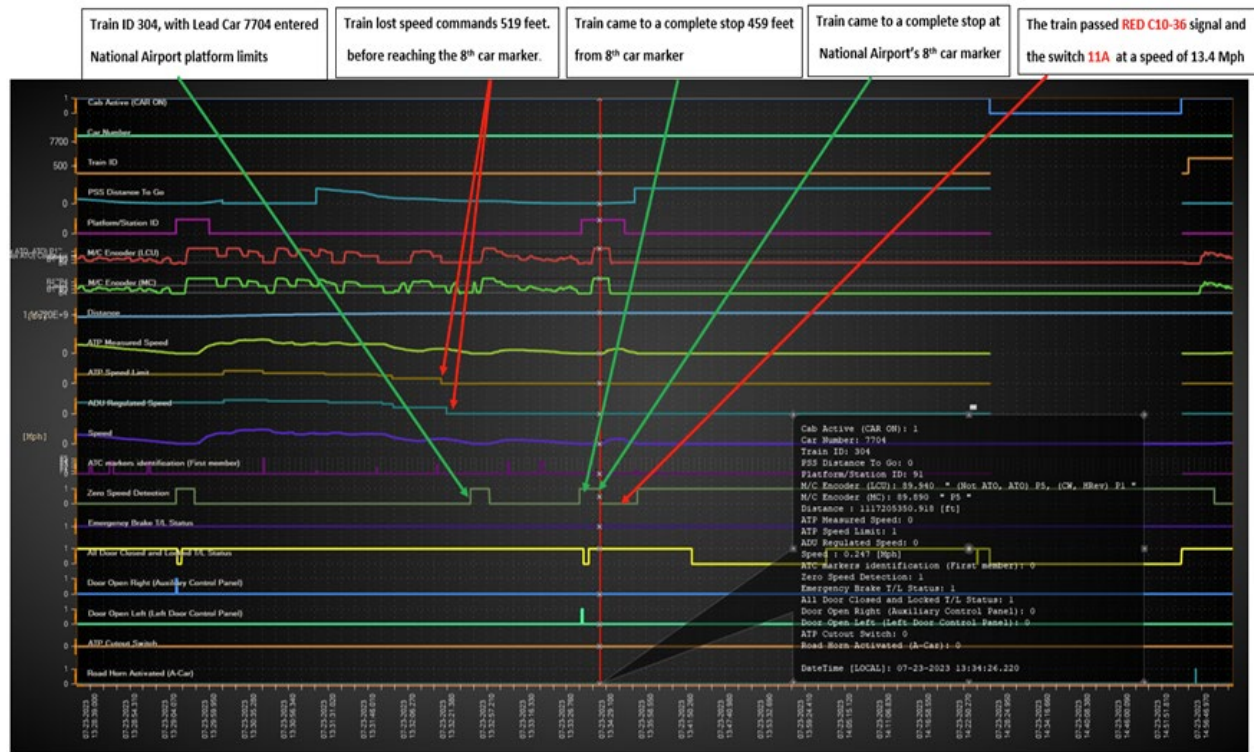


Figure 2 - Map depicting the incident.

**Office of Systems Maintenance, Office of Radio Communications (COMR)**

On July 25, 2023, COMR performed a radio testing between Potomac Yard Station and National Airport Station on tracks 1 and 2. The results were loud and clear; no problems were found.

**Automatic Train Control Maintenance (ATCM)**

*Adopted from ATCM report with minor formatting and grammatical edits:*

On July 23, 2023, Train ID 304 overran signal 36 at National Airport on track 1. The train stopped at CM C1 360+70 near the Receive Bond (WZ-33), around the middle of the interlocking on track-1. The train did not reach Switch 9. ROCC exercised Switch 9, there was no damage.

Incident Date: 07/23/2023 Time: 13:35 hours  
 Final Report – Red Signal Overrun  
 E23514

Drafted By: SAFE 707 – 09/19/2023  
 Reviewed By: SAFE 706 – 06/04/2024  
 Approved By: SAFE 71 – 09/21/2023

ATCM personnel clamped the switch in a normal position with permission from ROCC. ROCC allowed the train to continue on track 1 with the switch clamped in a normal position.

Two ATCM personnel and one Safety personnel were on the scene. The train continued to Crystal City Station.

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

*Adopted from RTRA report:*

On July 23, 2023, RTRA issued a Supervisor Notification that required the Rail Supervisors to discuss the event with the Train Operators and review the importance of verifying a lunar, correct rail alignment, and speed commands before moving the train.

### **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.*

### RTRA

#### *Train Operator*

- The Train Operator stated that they felt moderately alert and anxious before the event.
- The Train Operator stated that they were feeling anxious because their coworker sounded upset and afraid, and ROCC was not responding timely. The Train Operator stated that they just wanted to get down the line so that they wouldn't feel overwhelmed.
- The Train Operator stated that the last station that they serviced was National Airport Station, and when they closed the doors, they proceeded to move the train.
- The Train Operator stated that they probably were not paying attention because they do the same thing every day on the same line, and they assumed that they had a lunar.
- The Train Operator stated that they did not know that they overran the signal until they contacted ROCC to report no speed commands.

### ROCC

#### *Radio RTC*

- The Radio RTC stated that sometime during a prior incident involving a disabled train, the operator at National Airport on track 1 overran the signal.
- The Radio RTC stated that there was a lot of confusion going on because, in the midst of trying to deal with the actual emergency, the radio communication was extremely poor. The Radio RTC stated that barely anyone could hear them, and they had to repeat everything about five times.
- The Radio RTC stated that communication and coordination with that emergency was really difficult, and it created a much more hectic environment than necessary.
- The Radio RTC stated that they were feeling stressed, and they were concerned because they didn't want people to try to exit off of the disabled train.
- The Radio RTC stated they did not notify the operator of the red signal at the end of the platform because they were dealing with everything else.
- The Radio RTC stated that they provided a permissive block to the 8-car marker and instructed the operator to hold.

- The Radio RTC stated that both the 7k and the Legacy series cars have stop and proceed, and you have to punch in a code in order to move the train.

## **Weather**

On July 23, 2023, at the time of the incident, NOAA recorded the temperature as 86°F, with scattered clouds, winds 10 mph, and 46% humidity. The weather was not a contributing factor in this incident (Weather source: NOAA – Location: Alexandria, VA).

## **Related Rules and Procedures**

### **MSRPH Section 3 – Operating Rules**

3.67 – Rail vehicles shall not be operated past or closer than a point 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.

3.67.1 – Rail Operations Control Center Supervisors or Rail Transportation Supervisors shall advise Train Operators when they are approaching red signals that are positioned just beyond the station platforms.

3.79 – Train Operators 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 (see SOP #15).

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 (Reference SOP # 40).

3.79.2 – On 7000 Series Trains – If speed commands are lost on the mainline and the consist comes to a complete stop with the ADU displaying the code number; the Operator must contact ROCC or terminal supervisor to obtain either a permissive block or absolute block before entering the corresponding number on the ADU touchpad to enter Stop and Proceed Mode.

## **Human Factors**

### Fatigue

#### *Signs and Symptoms of Fatigue*

### RTRA

#### *Train Operator*

OSI evaluated conditions at the time of the incident to distinguish whether evidence of fatigue was present. The video of the incident was reviewed for behaviors suggesting fatigue. No indications of fatigue were evident from the video. The Train Operator reported feeling moderately 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*

### RTRA

#### *Train Operator*

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 two shifts in the days leading up to the incident. The Train Operator was awake for 7.83 hours at the time of the incident. The Train Operator reported 6 hours of sleep in the 24 hours preceding the incident. The off-duty period was 15.28 hours, providing an opportunity for 7-9 hours of sleep. This was more than the Train Operator's usual workday sleep durations. The employee 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

- An emergency involving a disabled train with customers aboard outside of Potomac Yard Station occurred prior to this event and necessitated the use of National Airport Station to manage rail traffic.
- The amount of radio communications was increased due to the emergency outside of Potomac Yard Station.
- After providing the permissive block to the Train Operator, the Radio RTC did not advise the Train Operator that they were approaching signal C10-36 displaying a red aspect
- The Train Operator failed to verify the presence of speed commands, a lunar signal and correct rail alignment prior to closing the platform doors.
- Signal C10-36 is a left-side aligned signal, which is on the opposite side of the Train Operator's console.
- Stop and Proceed mode does not reset on activation of the Door Open Pushbutton.
- The Train Operator was certified in April 2023 and passed their certification<sup>3</sup> on the second attempt.

### Immediate Mitigation to Prevent Recurrence

- A Rail Supervisor was dispatched to National Airport Station to take over operating the train.
- ATCM personnel were dispatched to National Airport Station to inspect the switches.
- The Train Operator was removed from service.
- The train consist was removed for post-incident inspection.

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<sup>3</sup> According to the Train Operator Proficiency Evaluation, "During the Yard Operations portion of the certification, the Student Operator stated they were unable to clamp switch 87 in the reverse position, but the switch was in a normal position. The Student Operator was unsuccessful at completing this exercise."

## **Probable Cause Statement**

The probable cause of the Red Signal Overrun event on July 23, 2023, at National Airport Station, was a failure to adhere to established procedures by the Train Operator (e.g., verifying presence of speed commands and lunar signal), who acknowledged not paying attention before moving the train past the red signal. Contributing factors to the event were a human factors failure of complacency and an inadequate safeguard with the Stop and Proceed software. In addition, the Radio RTC did not advise the Train Operator that the signal ahead was red signal.

## Recommended Corrective Actions

<b>Corrective Action Code</b>	<b>Description</b>	<b>Responsible Party</b>	<b>Estimated Completion Date</b>
110141_SAFE CAPS_RTRA_ 01	Conduct a Red Signal Overrun Campaign Mandating Division Managers to discuss red signal overruns and review MSRPH Operating Rule 3.67 with Train Operators.	RTRA	Completed
110141_SAFE CAPS_RTRA_ 02	RTRA to implement the following: Increase QC audits on Zero Speed Commands.	RTRA	Completed
110141_SAFE CAPS_RTRA_ 02	Increase QC audits on SOP 40 (Door Operations)	RTRA	Completed
110141_SAFE CAPS_RTRA_ 02	Lessons Learned on recent red signal overrun, requiring a signature upon receipt for all operational personnel.	RTRA	Completed
110141_SAFE CAPS_RTRA_ 02	Increase Spot Checks on new operators.	RTRA	Completed
110141_SAFE CAPS_RTRA_ 02	Enact the 60-day cycle of the "30/60/90 New Operator Evaluations" to focus on situational awareness during unusual situations on the mainline.	RTRA	Completed
110141_SAFE CAPS_RTRA_ 02	Seek resources outside of ROQT to build and implement a Point and Call defensive ops program.	RTRA	Completed
110141_SAFE CAPS_RTRA_ 02	Train Operator to attend Refresher Training with an emphasis on MSRPH Operating Rule 3.67 & 3.79.	RTRA	Completed
110141_SAFE CAPS_ROCC_ 01	Radio RTC to receive a Written Reinstruction on MSRPH Section 3 OR - 3.67.1	ROCC	Completed
110141_SAFE CAPS_ROCC_ 02	ROCC to include MSRPH Section 3 OR - 3.67.1 (MOR 3.1.1) as a point of discussion during the Daily Shift Briefing with RTCs for all shifts.	ROCC	Completed
110141_SAFE CAPS_SAFE_ 01	Publish a Safety Bulletin dated July 24, 2023, for all staff, emphasizing the importance of paying attention and being in the right frame of mind to reduce the impact of a potential 'summer spike' of safety events.	SAFE	Completed
110141_SAFE CAPS_SAFE_ 02	Provide Oversight on the following components: <ul style="list-style-type: none"> <li>• Skill Survey of Train Operators</li> </ul>	SAFE	Completed

Corrective Action Code	Description	Responsible Party	Estimated Completion Date
	<ul style="list-style-type: none"> <li>• Train Operator Course Audit</li> <li>• Dropped Speed Command Data Audit</li> <li>• Oversight of Rail Operations and Radio Communications.</li> </ul>		



## Appendix A – Interview Summary

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

### RTRA

#### *Train Operator*

The Train Operator is a WMATA employee with 10 years of service and 3 months of experience as a Train Operator. The Train Operator holds a Roadway Worker Protection (RWP) Level 2 certification that expires in December 2023.

The Train Operator stated that their schedule was on the yellow line back and forth from Huntington Station to Mount Vernon Square Station. The Train Operator stated that when they reported on duty, they went to Huntington Station to pick up their train.

The Train Operator stated that they felt moderately alert and anxious before the event.

The Train Operator stated that they were feeling anxious because their coworker sounded upset and afraid, and ROCC was not responding timely. The Train Operator stated that they just wanted to get down the line so that they wouldn't feel overwhelmed.

The Train Operator stated that a coworker was transmitting and “freaking out” over some smoke on their train, and the line was being held up because passengers were stuck on the train. The Train Operator stated that ROCC was trying to get the trains moving to accommodate the passengers.

The Train Operator stated that the last station that they serviced was National Airport Station, and when they closed the doors, they proceeded to move the train.

The Train Operator stated that they probably were not paying attention because they do the same thing every day on the same line, and they assumed that they had a lunar. The Train Operator stated that they did not know that they overran the signal until they contacted ROCC to report no speed commands. The Train Operator stated that ROCC asked if they passed the signal, and they responded that they had passed the signal.

The Train Operator stated that they sat in the same location for approximately 30 minutes. The Train Operator stated that the Station Manager came to the front of the train, and the train was offloaded. The Train Operator stated that they were not aware that the train was being offloaded. The customers were aboard the incident train for 10 minutes until they were moved to the recovery train. The Train Operator stated that they a supervisor boarded the train and said that they passed a red signal. The Train Operator stated that they were not aware that they had run a red signal.

The Train Operator stated that they were aware that the signal was on the left side of the train. The Train Operator stated that this was their first time experiencing a “real-world” issue, and normally, there are just doors that aren't closing, not where there are people stuck and the Train Operator is hysterical.

### ROCC

#### *Radio RTC*

The Radio RTC is a WMATA employee with 8 years of service and 2 years and 11 months of experience as a Rail Traffic Controller. The Train Operator holds a Roadway Worker Protection (RWP) Level 2 certification that expires in December 2023.

The Radio RTC stated that sometime during a prior incident involving a disabled train, the operator at National Airport on track 1 overran the signal. The Radio RTC stated that it was perplexing why the signal had been overran because it had been red for quite some time, and the interlocking was set up for the train in the pocket track to leave out onto track 1.

The Radio RTC stated that there was a lot of confusion going on because, in the midst of trying to deal with the actual emergency, the radio communication was also extremely poor. The Radio RTC stated that barely anyone could hear them, and they had to repeat everything about five times. The Radio RTC stated that there were a lot of personnel requests for central to repeat or them asking the personnel to repeat; the radios were choppy.

The Radio RTC stated that the CMNT personnel sent to deal with the incident train at Potomac Yard couldn't hear them. The Radio RTC stated that the phones were ringing off the hook because no one could hear ROCC, and they were asking for instructions by phone.

The Radio RTC stated that communication and coordination with that emergency was really difficult, and it created a much more hectic environment than necessary.

The Radio RTC stated that they were feeling stressed, and they were concerned because they didn't want people to do things like try to exit off of the train and have a much bigger issue. The Radio RTC stated that they tried to deal with the incidents as safely and efficiently as possible.

The Radio RTC stated that in the MSRP 3.6 is cited where ROCC are to inform the operator that the signal ahead of them is red as they're approaching. The Radio RTC stated they believe that's what the consensus was as far as what ROCC could have done to prevent the red signal overrun.

The Radio RTC stated that they did not notify the operator because they were dealing with everything else. The Radio RTC stated they had a permissive block to the 8-car marker and instructed the operator to hold.

The Radio RTC stated that both the 7k and the Legacy series cars have stop and proceed, meaning that you have to punch in a code in order to move the train. Once you punch in the code, as long as the signal ahead of you is still red, you can only move 15 mph, and then once the operator moved to the 8-car marker, they should have seen that the signal was red.

# Appendix B – Train Operator’s Certification Evaluation



## TRAIN OPERATOR AND ROAD SUPERVISOR JOB TASK PROFICIENCY EVALUATION



Name:	[REDACTED]	Emp.No:	[REDACTED]	Division:	ROQT	Date:	04/25/2023
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Reason for Certification: *Please place a check in an area below.*

Certification: Student    Pre-certification: Student    Division Request    Re-Certification    Return to Duty    Other \_\_\_\_\_

Exam Administered	Score	Date Taken	Equipment (current/working condition)	Yes	No
MSRPH version #:	91%	03/22/2023	MSRPH	✓	
TVOIM/TOIM	89%	03/22/2023	Perm/Temp/Special Orders	✓	
Supervisor Combination	%		Troubleshooting Guide	✓	
Practical attempt #:1	QL-3	04/25/2023	Flashlight	✓	
			Safety Vest	✓	
			Footwear	✓	
			Identification (One Badge, RWP)	✓	

Comments

Student Operator [REDACTED] must retake Manual Switch Operation in category III Yard Operation on the second attempt.

Signatures:	Date:
Employee: [REDACTED]	4/25/2023
Examiner: [REDACTED]	4/25/2023

CATEGORIES / SUBCATEGORIES	QUALITY LEVEL	REMARKS (Remarks are required for a quality level score of 2 or 3)
I. Preparation for Service	1	Cars Used: 7408-7409X7727-7726
1. Exterior Inspection	1	#7726 Barrier Unsecured #7727 BCCO BCO C/O #7409 Rotary Drum C/O
2. Interior Inspection - Trailing Cab	1	#7408 Horn C/O
3. Interior Inspection - Each Car	1	#7408 Missing Emergency Evacuation Board #7408 Open Equipment Access Panel
4. Interior Inspection - Oper. Cab	1	#7409 Car light C/B Tripped
5. Rolling Test / Rolling Brake Test	1	Time Allotted: 35:00 / Actual Time: 34:08
II. Mainline Operation	1	
6. Communications	1	
7. Door Oper. & Station Stopping	1	
8. Use of Horn	1	
9. Speed Adherence/Manual Oper.	1	
10. Turn Back Moves	1	Location: A10 Time Allotted: 02:00 / Actual Time 1:07
11. Manual Route Selection	1	Location: A15-02 Time Allotted: 00:30 (1:00) / Actual Time: 00:05
12. EV Shutoff	1	
III. Yard Operation	3	
13. Communications	1	
14. Yard Movements	1	
15. Coupling	1	Time Allotted: 08:00 (12) / Actual Time: 6:36 Cars Used: 7431+7193
16. Uncoupling	1	Time Allotted: 05:00 (7.5) / Actual Time: 4:51 Cars Used: 7192<7408
17. Isolation (Self-Recovery)	1	Time Allotted: 15:00 (22.5) / Actual Time: 12:14 Cars Used: 7192+7408
18. Manual Switch Operation	3	Switch 87 Student Operator stated she was unable to clamp switch 87 in the reverse position, but the switch was in a normal position.
IV. Miscellaneous	2	
19. Recovery Train Operation	1	Time Allotted: 12:00 (18) / Actual Time: 11:17 Cars Used: 7408+7192
20. Troubleshooting	2	Cars Used: 7430-7431X7193-7192X7408-7409X7727-7726
<p>#1 No Brakes Off/Stuck Holding Brake (Holding Brake valve C/O) #7193 Time: 11:33 Operator deviated from the prescribed procedures in the Train Operations Guide &amp; Procedural Checklist Matrix and exceeded the allotted time by 01:33.</p> <p>#2 No All Doors Closed (Door Control C/B tripped) #7192 Time: 5:47</p> <p>During the Yard Operations portion of the certification, the Student Operator stated she was unable to clamp switch 87 in the reverse position, but the switch was in a normal position. The Student Operator was unsuccessful at completing this exercise.</p>		

Document 2 - Train Operator's Certification Evaluation Form, Page 2 of 2



# TRAIN OPERATOR AND ROAD SUPERVISOR JOB TASK PROFICIENCY EVALUATION



Name:	[Redacted]	Emp.No:	[Redacted]	Division:	Rail Training	Date:	05-01-2023
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Reason for Certification: *Please place a check in an area below.*

Certification: Student     Pre-certification: Student     Division Request     Re-Certification     Return to Duty     Other

Exam Administered	Score	Date Taken	Equipment (current/working condition)	Yes	No
MSRPH version #:	91 %	3-22-23	MSRPH	/	
TVOIM/TOIM	89 %	3-22-23	Perm/Temp/Special Orders	/	
Supervisor Combination	%		Troubleshooting Guide	/	
Practical attempt #: 2	QL-Pass	5-1-23	Flashlight	/	
			Safety Vest	/	
			Footwear	/	
			Identification (One Badge, RWP)	/	

Comments

[Empty space for comments]

Signatures:	[Redacted]	Date:	
Employee:	[Redacted]		05/01/2023
Examiner:	[Redacted]		05-01-2023

Document 3: Train Operator's Certification Evaluation Form, Page 1 of 2

TRAIN OPERATOR AND ROAD SUPERVISOR JOB TASK PROFICIENCY EVALUATION (continuation sheet)

Emp No. [REDACTED]

Date: 05-01-2023

CATEGORIES / SUBCATEGORIES	QUALITY LEVEL	REMARKS (Remarks are required for a quality level score of 2 or 3)
I. Preparation for Service	√ A	Cars Used:
1. Exterior Inspection		
2. Interior Inspection - Trailing Cab		
3. Interior Inspection - Each Car		
4. Interior Inspection - Oper. Cab		
5. Rolling Test / Rolling Brake Test		
		Time Allotted: 35:00 / Actual Time: :
II. Mainline Operation		
6. Communications		
7. Door Oper. & Station Stopping		
8. Use of Horn		
9. Speed Adherence/Manual Oper.		
10. Turn Back Moves		Location: Time Allotted: 02:00 / Actual Time: :
11. Manual Route Selection		Location:
12. EV Shutoff	√	Time Allotted: 00:30 (1:00) / Actual Time: :
III. Yard Operation	/	
13. Communications	/	
14. Yard Movements	N/A	
15. Coupling	N/A	Time Allotted: 08:00 (12) / Actual Time: : Cars Used: +
16. Uncoupling	N/A	Time Allotted: 05:00 (7.5) / Actual Time: : Cars Used: < >
17. Isolation (Self-Recovery)	N/A	Time Allotted: 15:00 (22.5) / Actual Time: : Cars Used:
18. Manual Switch Operation	/	# 161
IV. Miscellaneous	N/A	
19. Recovery Train Operation		Time Allotted: 12:00 (18) / Actual Time: : Cars Used: +
20. Troubleshooting		

RTRA 906 01-00

TRAIN OPERATOR AND ROAD SUPERVISOR JOB TASK PROFICIENCY EVALUATION

Page 2

Document 4: Train Operator's Certification Evaluation Form, Page 2 of 2

Incident Date: 07/23/2023 Time: 13:35 hours  
 Final Report – Red Signal Overrun  
 E23514

Drafted By: SAFE 707 – 09/19/2023  
 Reviewed By: SAFE 706 – 06/04/2024  
 Approved By: SAFE 71 – 09/21/2023

**ATTENTION OPERATORS:**

**A RED SIGNAL OVERRUN OCCURRED TODAY,  
TUESDAY, JULY 11, 2023, AT MT. VERNON SQUARE.**

**PLEASE VERIFY A LUNAR, CORRECT RAIL ALIGNMENT,  
AND SPEED COMMANDS BEFORE TAKING A POINT OF  
POWER & MOVING YOUR TRAIN.**

**SEE A RAIL OPERATIONS SUPERVISOR OR AN RTRA  
DIVISION MANAGER IF YOU HAVE QUESTIONS OR  
CONCERNS.**

**PLEASE BE SAFE.**

*Document 5 - Notice to Train Operators regarding Red Signal Overruns, Page 1 of 1*

Team,

In less than two (2) weeks, there have been three (3) red signal overruns.

- Tuesday, July 11, 2023: Mt. Vernon Square, Track #1
- Friday, July 21, 2023: West Falls Church, Track #2
- Sunday, July 23, 2023: National Airport, Track #1

To minimize recurrences, please conduct increased discussions with operators regarding the following rule:

***Operating Rule 3.67** – Rail vehicles shall not be operated past or closer than a point 10 feet in approach of an interlocking signal or lamp displaying a red aspect, a red flag, or a dark interlocking signal, unless authorized by ROCC or the Interlocking Operator and the move is consistent with customer safety as specified in Rule 3.1. ROCC or Interlocking Operator shall give permission to pass a red signal or dark aspect after the switches have been blocked or clamped for the required move in accordance with SOP #35. Once this has been verified the train or track unit will be given permission to pass the red signal or dark aspect at a speed no greater than 5mph.*

Thru August 1, 2023, each Rail Operations Supervisor will be required to document (within the RSDAR application) a minimum of five (5) discussions per day regarding this matter.

Contact an RTRA Division Manager if you have questions or concerns regarding this directive.

Thank you for your immediate attention and compliance, please be safe.

*Document 6 - Notice to Rail Supervisors regarding Red Signal Overruns, Page 1 of 1*



# Appendix D – Work Orders



## Washington Metropolitan Area Transit Authority Maintenance and Material Management System Work Order Details

Page 1 of 1  
MX76PROD

Work Order #: 18024334  
Type: CM



Status: CLOSE  
07/25/2023 01:00

Work Description: C10, Safety request Radio Operational test in Station area, Tracks 1,2&3  
Job Plan Description:

Work Information									
Asset: COMMC10 COMM, COMMUNICATIONS SYSTEM, C10			Owning Office: COMM-TSSM			Parent:			
Asset Tag:			Maintenance Office: COMM-TSSM-CFLD			Create Date: 07/24/2023 07:52			
Asset S/N: COMM C10			Labor Group: COMMR3RADO			Actual Start: 07/25/2023 01:00			
Location: 7939 C10, RONALD REAGAN WASHINGTON NATIONAL AIRPORT, STATION, MEZZANINE, 046, S, ROOM C110, COMMUNICATIONS ROOM			Crew:			Actual Comp: 07/25/2023 01:00			
Work Location:			Lead: E014279			Item: R60000001			
Failure Class: SAMS004 HANDHELD RADIO EQUIPMENT			GL Account: WMATA-02-33540-50499280-042-*****-****-OPR**						
Problem Code: 2500 NO PROBLEM FOUND			Supervisor:			Target Start:			
Requested By:			Requestor Phone:			Target Comp:			
Chain Mark Start:			Chain Mark End:			Scheduled Start:			
Create-Mileage: 0.0			Complete-Mileage: 0.0						
Task IDs									
Task ID									
10 SEE DESCRIPTION									
CONDUCTED SAFTEY REQUESTED RADIO CHECK FROM C09 TO C11, AND WITH OPS 3 TK 1&2 SUCCESSFULLY, LOUD AND CLEAR.									
Component:		Work Accomp:		Reason:		Status: CLOSE		Position:	Warranty?: N
Actual Labor									
Task ID	Labor	Start Date	End Date	Start Time	End Time	Approved?	Regular Hours	Premium Hours	Line Cost
10		07/24/2023	07/24/2023	10:00	14:00	Y	04:00	00:00	\$172.78
Total Actual Hour/Labor:							04:00	00:00	\$172.78
Failure Reporting									
Cause	Remedy			Supervisor			Remark Date		
3307 UNKNOWN CAUSE	3191 TESTED - NO TROUBLE FOUND						07/24/2023		
Remarks: CONDUCTED SUCCESSFUL SAFTEY REQUESTED RADIO CHECKS LOUD AND CLEAR C09-C11, OPS3									

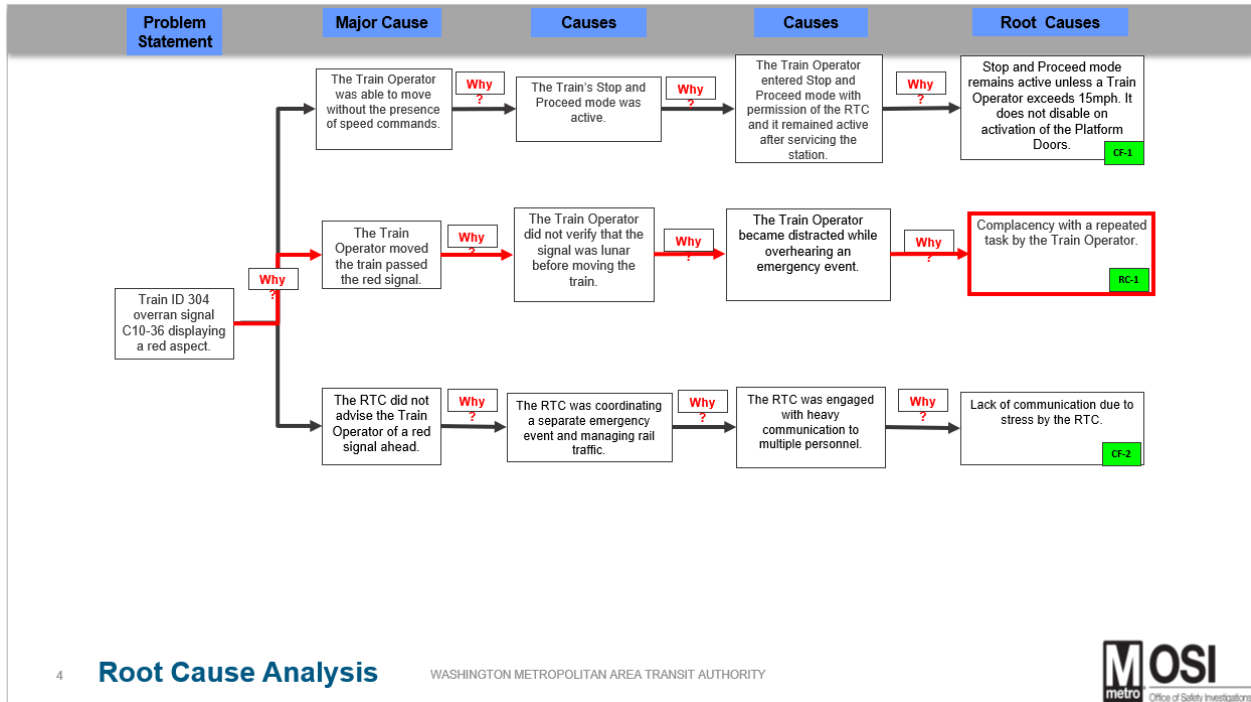
Document 7 - CMOR Work Order Number 18024334, Page 1 of 1

Incident Date: 07/23/2023 Time: 13:35 hours  
Final Report – Red Signal Overrun  
E23514

Drafted By: SAFE 707 – 09/19/2023  
Reviewed By: SAFE 706 – 06/04/2024  
Approved By: SAFE 71 – 09/21/2023

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# Appendix E – Why-Tree Analysis



4

## Root Cause Analysis

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY





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

**FINAL REPORT OF INVESTIGATION A&I E23838**

<b>Date of Event:</b>	November 19, 2023
<b>Type of Event:</b>	Red Signal Overrun
<b>Incident Time:</b>	09:12 Hours
<b>Location:</b>	West Falls Church Yard – Signal K99-302
<b>Time and How received by SAFE:</b>	10:42 Hours – SAFE/MAC
<b>WMSC Notification Time:</b>	11:45 Hours
<b>Responding Safety Officers:</b>	Office of Safety Investigations (OSI)
<b>Rail Vehicle:</b>	L7594-95x7379-78x7500-01x7325-24T
<b>Injuries:</b>	None
<b>Damage:</b>	None
<b>Emergency Responders:</b>	None
<b>SMS I/A Incident Number:</b>	20231119#112900MX

# West Falls Church Yard – Red Signal Overrun

November 19, 2023

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## **Abbreviations and Acronyms**

<b>AIMS</b>	Advanced Information Management System
<b>ARS</b>	Audio Recording System
<b>ATCE</b>	Automatic Train Control Engineering
<b>ATCM</b>	Automatic Train Control Maintenance
<b>CCTV</b>	Closed-Circuit Television
<b>COMR</b>	Office of Radio Communications
<b>CMOR</b>	Office of Chief Mechanical Officer
<b>IIT</b>	Incident Investigation Team
<b>MICC</b>	Metro Integrated Command & Communications Center
<b>MOR</b>	Metrorail Operating Rulebook
<b>MOC</b>	Maintenance Information Center
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NVR</b>	Network Video Recorder
<b>OM</b>	Operations Manager
<b>PPE</b>	Personal Protection Equipment
<b>ROIC</b>	Rail Operations Information Center
<b>RTC</b>	Rail Traffic Controller
<b>RTRA</b>	Office of Rail Transportation
<b>ROCC</b>	Rail Operations Control Center
<b>RWP</b>	Roadway Worker Protection
<b>SAFE</b>	Department of Safety
<b>SMS</b>	Safety Measurement System
<b>VMDS</b>	Vehicle Monitoring and Diagnostic System
<b>WMATA</b>	Washington Metropolitan Area Transit Authority



**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 Sunday, November 19, 2023, at 10:41 hours, an Interlocking Operator at West Falls Church Rail Yard reported a Red Signal Overrun to the Metro Integrated Command & Communications Center (MICC).

Prior to the event, at 09:09 hours, the Interlocking Operator instructed the Train Operator to couple 7594-95 to 7379-78x7500-01x7325-24, making an 8-car consist and then move the cars from storage track 1B and secure the cars at the road crossing near the Train Operators Administration Building. The Train Operator coupled the cars and began moving the consist.

At 09:12 hours, the Train Operator passed signal K99-302, displaying a red aspect, traversing switches 301 and 303A. At 09:13 hours, the Train Operator reported to the Interlocking Operator stopped at signal K99-134 red. Seconds later, signal K99-134 changed from red to lunar.

At 09:17 hours, the Interlocking Operator exited the Tower and approached the consist at signal K99-134. At 09:18 hours, the Train Operator moved the consist passing signal K99-134 lunar and stopped at K99-56 red, the Train Operator reversed ends. At 09:19 hours, the Interlocking Operator returned to the Tower.

At 09:23 hours, the Interlocking Operator instructed the Train Operator to secure the consist on track 10.

At 9:29 hours, the Interlocking Operator contacted the Maintenance Information Center (MOC), reported a dark signal at K99-302, and requested a response from the Office of Automatic Train Control Maintenance (ATCM) personnel.

At 10:24 hours, the Interlocking Operator contacted the MICC, and requested to take a personal break. At 10:41 hours, the Interlocking Operator contacted the MICC, and advised that they had returned from their personal break and reported the red signal overrun.

The Interlocking Operator notified the West Falls Church Division Assistant Superintendent and an Office of Rail Transportation (RTRA) Rail Supervisor of the event.

The Button Rail Traffic Controller (RTC) notified the Rail Operations Information Center (ROIC) and the Operations Manager (OM) of the event.

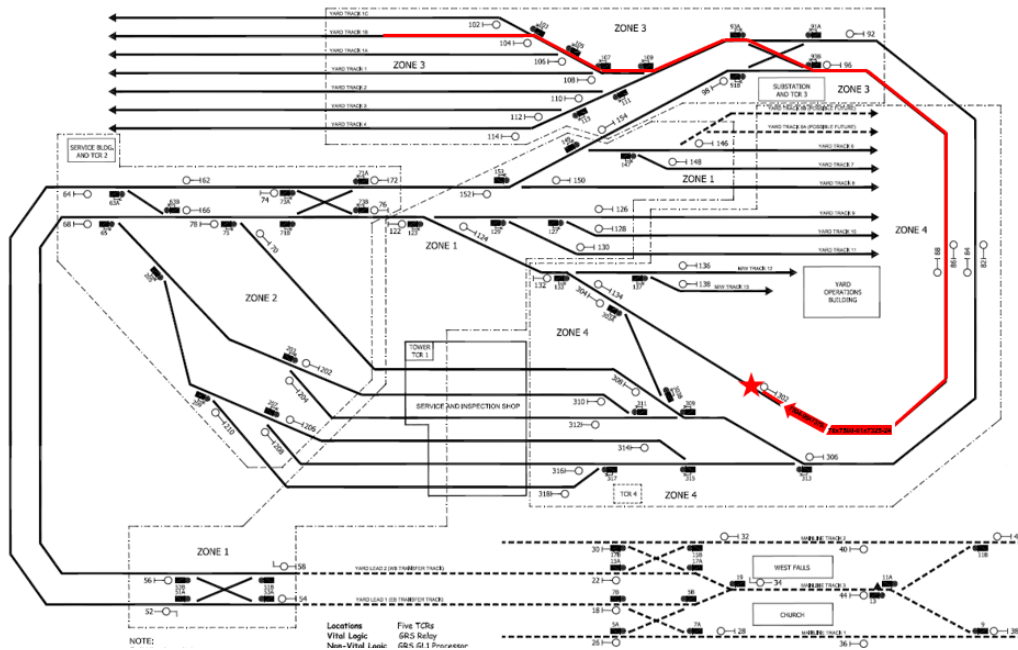
RTRA removed the Interlocking Operator and Train Operator from service for post-incident testing. The consist was removed from service for post-incident inspection.

The probable cause of the Red Signal Overrun event at West Falls Church Yard on November 19, 2023, was the Train Operator's misinterpretation of instructions from the Interlocking Operator, and loss of situational awareness by the Train Operator when they failed to stop the train at the instructed location. Contributing factors were bulbs within the red aspects at signal K99-302 required replacement, and the weather, as the forecast reported sunny conditions, which led to the red aspects at signal K99-302 being faintly noticeable, as reported by the Train Operator.

## Incident Site

West Falls Church Yard – Signal K99-302

## 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:

- Physical Site Assessment
- 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
  - Interlocking Operator
- 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 – Collection of relevant work history information and process documentation contained in WMATA systems of record. These records include:
  - Train Operator Written Statement

Incident Date: 11/19/2023 Time: 09:12 hours  
Final Report – Red Signal Overrun  
E23838

Drafted By: SAFE 707 – 11/30/2023  
Reviewed By: SAFE 702 – 05/23/2024  
Approved By: SAFE 707 – 05/29/2024

Page 6



- Train Operator Training Records
  - Train Operator Certifications
  - Train Operator 30-Day work history review
  - Interlocking Operator Written Statement
  - Interlocking Operator Training Records
  - Interlocking Operator Certifications
  - Interlocking Operator 30-Day work history review
  - Metrorail Operating Rulebook (MOR)
  - National Oceanic and Atmospheric Administration (NOAA)
  - Rail Operations Control Center (ROCC) Incident Report
  - Maximo Data
- System Data Recording Review – Collection of information contained in Metro Data Recording Systems. This data includes:
    - ARS (Audio Recording System) playback [Radio and Landline Communications]
    - The Office of Chief Mechanical Officer (CMOR) Incident Investigation Team (IIT) Vehicle Monitoring and Diagnostic System (VMDS)
    - ATCE Oracle Report
    - Closed-Circuit Television (CCTV)

### **Investigation**

On Sunday, November 19, 2023, at 09:12 hours, a Train Operator performing yard duties in West Falls Church Yard passed signal K99-302, displaying a red aspect, traversing switches 301 and 303A.



*Image 1 – Forward-facing Camera Image of the consist passing K99-302 at 09:12 hours.*

Prior to the event, the Train Operator secured rail cars in the Office of Car Maintenance (CMNT) Inspection Shop blow pit area on track 18. The Interlocking Operator instructed the Train Operator to board two rail cars (7595-7594) on track 1A. The Train Operator boarded the consist and was given instructions from the Interlocking Operator to move from signal K99-106 to signal K99-56

red, and then reverse ends. Next, the Interlocking Operator instructed the Train Operator to move from signal K99-68 to signal K99-88 red, and then reverse ends.

The Audio Recording System (ARS) revealed that at 08:59 hours, the Interlocking Operator instructed the Train Operator to move from signal K99-96 with an absolute block to track 1B, couple to 7379-78x7500-01x7325-24, and then come away with the 8-car consist. At 09:07 hours, the Train Operator reported coupling 7595 to 7379.

At 09:09 hours, the Interlocking Operator instructed the Train Operator to move from signal K99-104 with an absolute block to the road crossing near the Train Operator's Administration Building and secure the consist there. The Train Operator acknowledged and repeated the instructions.



Image 2 - Forward-facing Camera Image of the consist located at the road crossing near the Train Operators Administration Building.

The Closed-Circuit Television (CCTV) revealed that the consist arrived at the road crossing at 09:12 hours, stopped briefly, and then continued across the road crossing, exceeding the absolute block and instructions from the Interlocking Operator. Seconds later, the consist passed signal K99-302, displaying a red aspect traversing switch 301 and trailed switch 303A.

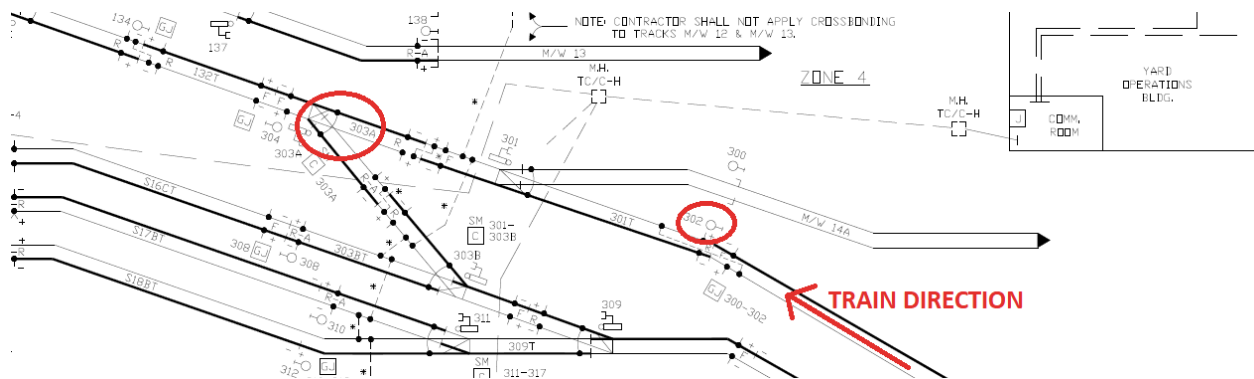


Figure 1 – West Falls Church Yard Layout Map of the incident area. The path of the train operating from the roadway towards the west side of the yard. The first circle is signal K99-302, which was red. The second circle is switch 303, which was trailed. It also shows switch 301 (after K99-302), which is not circled.

At 09:13 hours, the Train Operator reported to the Interlocking Operator stopped at signal K99-134 red. The Interlocking Operator instructed the Train Operator to hold at that location. Seconds later, signal K99-134 changed from red to lunar.



Image 3 - Forward-facing Camera Image of the consist located at K99-134 when the signal changed from red to lunar.

At 09:17 hours, the Interlocking Operator exited the Tower and approached the consist at signal K99-134 without any personal protection equipment (PPE) on, then walked along the consist, stopped and bent down near switch 303, then walked towards the cab window where the Train Operator was located.



Image 4 – Image of Switch 303A, indicating a trailed switch.

At 09:18 hours, the Interlocking Operator had a conversation with the Train Operator.



*Image 5 – Image of the Interlocking Operator having a conversation with the Train Operator at 09:18 hours.*

The Train Operator moved the consist passing signal K99-134 lunar and stopped at K99-56 red, then the Train Operator reversed ends. At 09:19 hours, the Interlocking Operator returned to the Tower.

At 09:23 hours, the Interlocking Operator instructed the Train Operator to move from signal K99-68 with an absolute block to track 10 to secure the consist.

At 9:29 hours, the Interlocking Operator contacted MOC, reported the red aspect was out at signal at K99-302, and requested a response from ATCM personnel. At 09:31 hours, the ATCM Supervisor contacted the Interlocking Operator via landline, and the Interlocking Operator reported that signal K99-302 had a dark aspect.



*Image 6 – Image of Signal K99-302, with red aspects faintly noticeable.*

At 09:37 hours, the Interlocking Operator contacted the ATCM Supervisor and reported that switch 303 was out of correspondence.

At 09:45 hours, the Interlocking Operator contacted a second Interlocking Operator located at Dulles Rail Yard and requested their assistance with the event.

At 10:05 hours, ATCM personnel arrived at West Falls Church Yard, contacted the Interlocking Operator, requested and was granted permission to inspect switch 303. At 10:09 hours, the ATCM personnel requested the Interlocking Operator to exercise switch 303, the Interlocking Operator reported that switch 303 was out of correspondence in normal and reverse positions.

At 10:24 hours, the Interlocking Operator contacted the MICC and advised that they were taking a personal break. At 10:41 hours, the Interlocking Operator contacted the MICC and advised that they were returning from their personal break and reported the red signal overrun event.

At 10:48 hours, the Interlocking Operator contacted and notified the West Falls Church Division Assistant Superintendent of the red signal overrun event and reported moving the train after the incident, “because it was blocking the roadway.”

At 10:52 hours, the Interlocking Operator contacted a Rail Supervisor, advised them of the red signal overrun event, and requested that they report to West Falls Church Yard.

At 11:00 hours, the Button RTC notified ROIC of the event. At 11:05 hours, the Button RTC notified the OM of the event.

RTRA removed the Interlocking Operator and Train Operator from service. A second Rail Supervisor was dispatched to West Falls Church Tower to cover the Interlocking Operator position until a replacement operator arrived.

At 12:00 hours, an Office of Safety Investigations (OSI) Investigator arrived at West Falls Church Yard and performed an assessment of the event.

The Office of Chief Mechanical Officer/Incident Investigation Team (CMOR/IIT) completed an analysis of the data collected from the train involved in this incident. According to the train data, there were no mechanical failures detected would have contributed to the cause. The train responded to all commands entered through the master controller.

ATCM confirmed that switch 303A had been trailed, Switch Obstruction Track Circuit Testing, Signal Light Testing, Switch Detector and Route Locking Testing, and Switch Indication Locking Test were conducted, and no damages were found to the switch points, the switch machine, or the layout. Switch 303A was restored and placed back in service.

ATCM performed an inspection of signal K99-302 and found that bulbs were “burned out” within the red aspects; the bulbs were replaced

### Chronological Event Timeline

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

Time	Description
08:41:38 hours	<u>Train Operator</u> : Reported secured rail cars in 18 blow pit. <u>Interlocking Operator</u> : Instructed to take two cars on track 1A. [Radio FC YD1]
08:48:30 hours to 08:55:24 hours	The Interlocking Operator instructed the Train Operator to board two rail cars (7595-7594) on track 1A. The Train Operator boarded the consist and was given instructions from the Interlocking Operator to move from signal K99-106 to signal K99-56 red, and then reverse ends. Next, the Interlocking Operator instructed the Train Operator to move from signal K99-68 to signal K99-88 red, and then reverse ends.
08:59:51 hours	<u>Interlocking Operator</u> : Instructed K99-96 absolute block to track 1B, make an add, and then come away with 8 cars. <u>Train Operator</u> : Acknowledged and repeated. [Radio FC YD1]
09:07:56 hours	<u>Train Operator</u> : Reported coupled 7595 to 7379. <u>Interlocking Operator</u> : Acknowledged and repeated. [Radio FC YD1]
09:09:47 hours	<u>Interlocking Operator</u> : Instructed K99-104 absolute block to the admin roadway and secure. <u>Train Operator</u> : Acknowledged and repeated. [Radio FC YD1]
09:12:55 hours	The consist passed K99-302 red. [CCTV]
09:13:21 hours	<u>Train Operator</u> : Reported standing by K99-134 red. <u>Interlocking Operator</u> : Instructed the operator to hold their location. [Radio FC YD1]

Time	Description
09:13:54 hours	Signal K99-134 changed from red to lunar. [CCTV]
09:17:10 hours	The Interlocking Operator exited the Tower. [CCTV]
09:18:18 hours	The Interlocking Operator had a conversation with the Train Operator. [CCTV]
09:18:45 hours	The consist continued past signal K99-134 and stopped at K99-56. [CCTV]
09:19:50 hours	The Interlocking Operator returned to the Tower. [CCTV]
09:23:26 hours	<u>Interlocking Operator</u> : Instructed K99-68 absolute block to track 10 and secure. <u>Yard Operator</u> : Acknowledged. [Phone K99]
09:29:20 hours	<u>Interlocking Operator</u> : Contacted MOC and reported a red signal out at K99-302 and requested ATCM to respond. [Phone K99]
09:31:07 hours	<u>Interlocking Operator</u> : Reported to ATCM that K99-302 had a dark aspect. [Phone K99]
09:37:43 hours	<u>Interlocking Operator</u> : Reported to ATCM that switch 303 was out of correspondence. [Phone K99]
09:45:51 hours	<u>Interlocking Operator</u> : Contacted another Interlocking Operator and requested assistance. [Phone K99]
10:05:14 hours	<u>ATCM</u> : Requested permission to inspect switch 303. <u>Interlocking Operator</u> : Granted permission. [Radio FC YD1]
10:09:16 hours	<u>ATCM</u> : Requested to exercise switch 303. <u>Interlocking Operator</u> : Acknowledged. [Radio FC YD1]
10:11:11 hours	<u>Interlocking Operator</u> : Reported switch 303 was out of correspondence in normal and reverse. [Radio FC YD1]
10:24:12 hours	<u>Interlocking Operator</u> : Contacted the Button RTC and advised that they were taking a personal break. [Phone K99]
10:41:36 hours	<u>Interlocking Operator</u> : Contacted the MICC and advised that they returned from taking a personal break. Reported a red signal overrun the yard. [Phone K99]
10:48:18 hours	<u>Interlocking Operator</u> : Contacted West Fall Church Assistant Superintendent and advised of the red signal overrun and reported moving the train because it was blocking the roadway. [Phone K99]
10:52:59 hours	<u>Interlocking Operator</u> : Contacted a Rail Supervisor and requested them to respond to the yard. [Phone K99]
11:00:19 hours	<u>Button RTC</u> : Notified ROIC of the red signal overrun. [Phone]
11:05:06 hours	<u>Button RTC</u> : Notified the Operations Manager of the red signal overrun. [Phone]

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

### **The Office of Chief Mechanical Officer (CMOR) / Vehicle Monitoring and Diagnostic System (VMDS)**

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

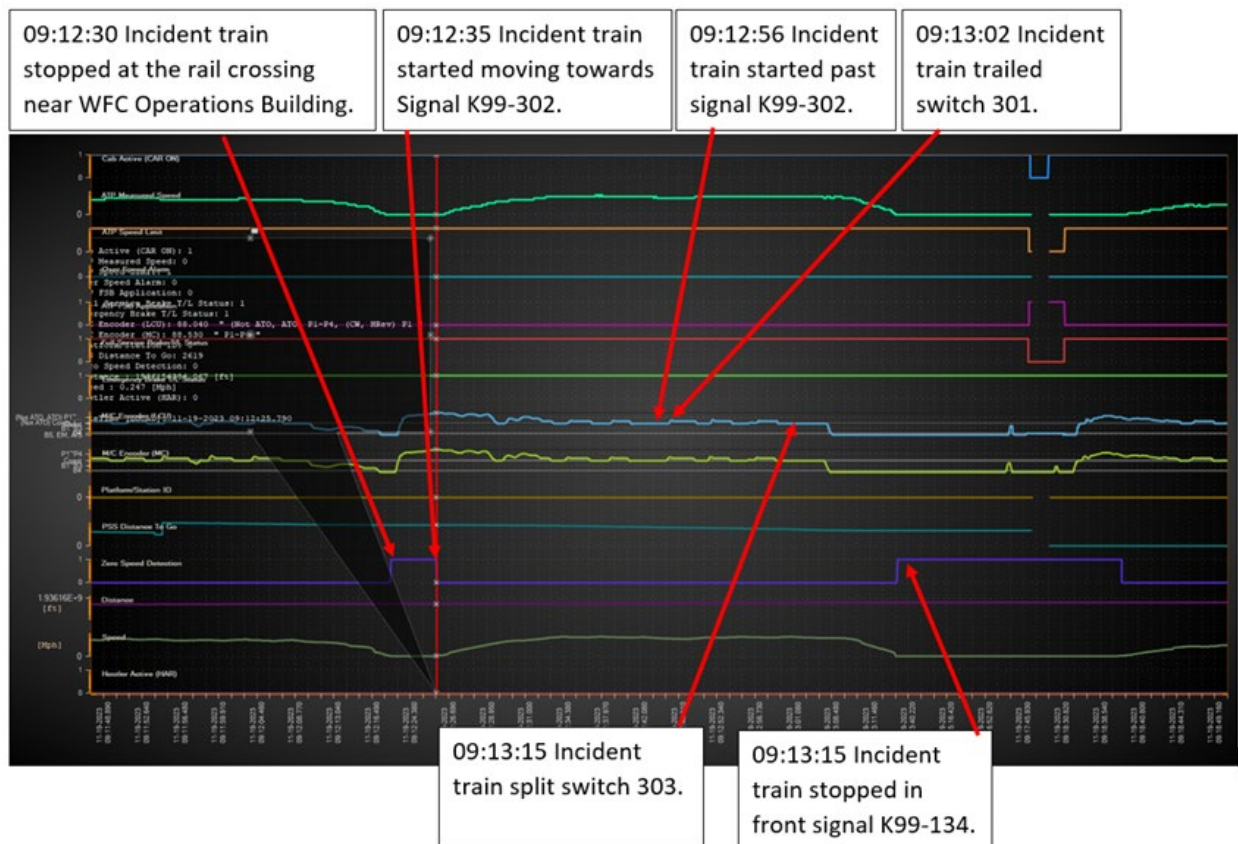
IIT completed an analysis of the data collected from this incident. According to the train data, there were no mechanical failures detected at the time of the incident that might have contributed to its cause.

The train responded to all commands entered through the master controller. The incident train (7548-7549-7378-7379-7500-7501-7324-7325) was observed overrunning signal K99-302 at 9:12:35 (NVR time). The NVR is not clear enough to tell if the red/lunar lights were on. The train continued moving, thus trailing switch 301 in normal position. Following that, the train continued to move, and IIT suspects the incident train to have split switch 303 (based on NVR observation). The incident train stopped in front of signal K99-134.

It is worth noting that radio communications were established between the Interlocking Operator and the Train Operator. During such radio communications, the Train Operator acknowledged the Interlocking Operator's instruction to "Secure 8 cars at the admin roadway". Unfortunately, such instruction was not followed, resulting in the incident train overrunning signal K99-302 and trailing/splitting switches 302 and 301.

Time	Description
09:12:30 hours	The incident train stopped at the road crossing near the WFC Operations Building.
09:12:35 hours	The incident train started moving towards signal K99-302.
09:12:56 hours	The incident train started past signal K99-302.
09:13:02 hours	The incident train trailed switch 301.
09:13:15 hours	The incident train split switch 303.
09:13:15 hours	The incident train stopped in front of signal K99-134.

Note: Times above may vary from other systems' timelines based on clock settings.



Graph 1 – Data Analysis



## **Office of Car Maintenance (CMNT)**

*Adopted from CMNT report:*

Performed a master control operation check and checked that brake rates were inspected on that car that had the red signal overrun. The master controller operates properly and the brake rates were inspected. Ran a DST, operates good. Checked for wheel flats, no flats found, the train is ready for service. All IIT recommendations complied with, no problem found, good daily inspection.

## **Office of Systems Maintenance, Office of Radio Communications (COMR)**

*Adopted from COMR report:*

Radio checks were loud and clear 95% of the time in West Falls Church Yard. Checked with the Tower Supervisor as to where the overrun took place. Performed radio checks at that signal. That also was loud and clear. Also went to West Falls Church Station and performed radio checks along the platform, those checks were loud and clear both tracks 1& 2 inbound and outbound with exception of one area inbound side on track 1 that has a garage in the area.

## **Automatic Train Control (ATCM)**

*Adopted from ATCM report:*

West Falls Church Tower reported at about 9:31 AM that SW303 was out of correspondence. At 9:34 AM, returned to the yard from Ballston Station. At 10:27 AM, ATC mechanics reported that SW 303A was trailed, but found no damage, internal or external. ATC Supervisors at West Falls Church Station responded to West Falls Church Yard Tower to pull out the record. Unfortunately, we were not able to pull it from the computer. The Interlocking Operator stated that they never set a lunar signal 302 and that the Train Operator overran red signal 302 between 8:30 AM to 9:00 AM.

ATCM confirmed that switch 303A had been trailed, Switch Obstruction Track Circuit Testing, Signal Light Testing, Switch Detector and Route Locking Testing, and Switch Indication Locking Test were conducted, and no damages were found to the switch points, the switch machine, or the layout. Switch 303A was restored and placed back in service.

ATCM performed an inspection of signal K99-302 and found that bulbs were “burned out” within the red aspects; the bulbs were replaced.

## **Automatic Train Control Engineering (ATCE)**

*Adopted from ATCE report:*

Data Regarding Red Signal 302 Overrun and Trailed Switch 303A could not be found due to a Server Synchronization error between two redundant servers at K99/West Falls Church Yard. Servers A and B experienced a fault on the 15th of November, and data between this failure and the 20th of November, when the ATC Engineer contacted Rail Comm to resolve the issue, has been lost.

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

*Adopted from RTRA report:*

RTRA determined that the Train Operator violated several rules and procedures in relation to this event.

The Train Operator was certified and began performing train operator duties on January 8, 2023, and since becoming a Train Operator, committed several operational violations.

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Incident Date: 11/19/2023 Time: 09:12 hours  
Final Report – Red Signal Overrun  
E23838

Drafted By: SAFE 707 – 11/30/2023
Reviewed By: SAFE 702 – 05/23/2024
Approved By: SAFE 707 – 05/29/2024

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- On March 18, 2023, a Station Overrun, resulted in disciplinary action, refresher training, and a supervisor ride.
- On March 29, 2023, a RWP Safety Violation resulted in disciplinary action and a written warning.
- On April 15, 2023, a Red Signal Overrun, resulted in disciplinary action.

The seriousness of the violations committed resulted in the Train Operator being disqualified from train operations.

RTRA determined that the Interlocking Operator violated Level II Operational/Safety policy and procedures by not wearing a safety vest prior to entering the roadway and for failing to make the proper notifications in a timely manner following the red signal overrun. The Interlocking Operator was also re-instructed that following the red signal overrun, the incident train should not have moved until an inspection had been conducted by ATCM personnel.

All Interlocking Operators were re-instructed to be very specific when providing instructions to operators regarding the road crossing near the administrative building as well as to ensure they receive a 100% repeat back.

### **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 stated that they took two cars from 1A, took them back to 1B, coupled them, and made 8 cars revenue-ready. The Train Operator stated that they were given an absolute block to the roadway.
- The Train Operator stated that they thought the Interlocking Operator meant the roadway on the west side of the yard since they are usually given instructions to another signal.
- The Train Operator stated that they were operating safely at normal speed, and after they crossed the roadway, they couldn't tell if the signal was red or lunar.
- The Train Operator stated that the glare of the sun made it hard to tell what the signal was, and they weren't paying attention.
- The Train Operator stated that they told the Tower that they were at a red signal, was instructed to stand by, and then they received a lunar.
- The Train Operator stated that the Interlocking Operator came out to the train and told them that they ran the red signal.
- The Train Operator stated that the Interlocking Operator told them to take the train to K99-56, key down reverse, and go to track 10.
- The Train Operator stated that after securing the train on track 10, they returned to signal K99-302 and confirmed that the signal was red, but the glare from the sun made the color light.

#### Interlocking Operator

- The Interlocking Operator stated that they instructed the Train Operator to get two cars on track 1B, and once the cars were coupled and revenue-ready, the Operator was given a lead to secure them at the roadway.
- The Interlocking Operator stated that they were doing paperwork writing down what the Train Operators were doing, and then the Operator informed them that they were holding

at K99-134 red. The Interlocking Operator stated that the Operator passed signal K99-302 red, and stopped at the very next signal, which was K99-134.

- The Interlocking Operator stated that K99-302 was red and that they did not set a lunar at the signal.
- The Interlocking Operator stated that they contacted Central and requested a personal break to go to the train and see what happened.
- The Interlocking Operator stated that they asked the Operator why they didn't stop at the roadway, and the Operator replied that they were still going to the roadway. The Interlocking Operator stated that they showed the Operator where the roadway was.
- The Interlocking Operator stated that they looked to make sure that the switch was laying in the correct position for the train to still move and confirmed the switch was in the correct position.
- The Interlocking Operator stated that they noticed that the train was blocking the roadway, and did not want to keep the roadway blocked, they returned to the Tower, and then sent the Operator a lead to continue to clear signal K99-68.
- The Interlocking Operator stated that they might have set the signal at K99-134 before exiting the Tower.
- The Interlocking Operator stated that notified Central and then ATC, and they responded to the yard. The Interlocking Operator stated that they did not notify Central of the red signal overrun because they were not 100% sure if the train had run the red signal.
- The Interlocking Operator stated that they noticed the interlocking screen flashing, and that was an indication that the switch was out of correspondence and indicated that a train was going over the switch.
- The Interlocking Operator stated that the ATC technician came to the Tower and said that something wasn't right.
- The Interlocking Operator stated that they delayed notifying Central about the red signal overrun because they were troubleshooting and trying to figure out exactly what the issue was.
- The Interlocking Operator stated that there are two roadways in the yard, and the Operators know where the admin building roadway is because that is where they park.

## Weather

On November 19, 2023, at the time of the incident, NOAA recorded the temperature as 50°F, Sunny, winds 6 mph, and 46% humidity. The weather was a contributing factor in this incident (Weather source: NOAA) – Location: Falls Church, VA.

## Related Rules and Procedures

Metrorail Operating Rulebook –

1.1 Guiding Safety Principles

1.2 Incident Reporting

3.1 Passing a Stop Signal

3.2 Absent or Imperfectly Displayed Signal

3.3 Signals Requiring a Stop

3.4 Improperly Lined Switches

12.4 Radio Transmission & Reception Procedures

17.11 Personal Protective Equipment Standard for On-Track Safety

## Human Factors

### Fatigue

#### *Signs and Symptoms of Fatigue*

##### Train Operator

We evaluated signs and symptoms of fatigue that may have been present at the time of the incident. No signs or symptoms of fatigue were detected from the available data. Video of the incident was reviewed for signs of the Train Operator's fatigue. No signs or symptoms of fatigue were evident from the video. 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.

##### Interlocking Operator

We evaluated signs and symptoms of fatigue that may have been present at the time of the incident. No signs or symptoms of fatigue were detected from the available data. Video of the incident was reviewed for signs of the Interlocking Operator's fatigue. No signs or symptoms of fatigue were evident from the video. The Interlocking Operator reported feeling fully alert at the time of the incident. The Interlocking Operator reported experiencing no symptoms of fatigue in the time leading up to the incident.

#### *Fatigue Risk*

##### Train Operator

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 one shift in the days leading up to the incident. The Train Operator was awake for 2.366666667 hours at the time of the incident. The Train Operator reported 8 hours of sleep in the 24 hours preceding the incident. The off-duty period was 15.166666667 hours which provides an opportunity for 7-9 hours of sleep. This was more than the Train Operator's usual workday sleep durations. The employee reported no issues with sleep.

##### Interlocking Operator

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 Interlocking Operator reported keeping a regular sleep schedule in the days leading up to the incident. The Interlocking Operator worked 0 shifts (Assigned Days Off) in the days leading up to the incident. The Interlocking Operator was awake for 12.2 hours at the time of the incident. The Interlocking Operator reported 7 hours of sleep in the 24 hours preceding the incident. The off-duty period was 33 hours which provides an opportunity for 7-9 hours of sleep. This was more than the Interlocking Operator's usual workday sleep durations. The Interlocking Operator reported no issues with sleep.

### Post-Incident Toxicology Testing

WMATA's Drug and Alcohol Program determined that the Train Operator complied with and was not in violation of the Drug and Alcohol Policy and Testing Program 7.7.3/6.

WMATA's Drug and Alcohol Program determined that the Interlocking Operator complied with and was not in violation of the Drug and Alcohol Policy and Testing Program 7.7.3/6.

### **Findings**

- The Train Operator acknowledged misinterpreting the instructions to stop at the road crossing.
- The Train Operator reported a glare from the sun reduced the visibility of observing the red signal.
- The Interlocking Operator contacted MOC and requested ATCM for a dark signal but did not inspect the signal.
- The Interlocking Operator contacted ATCM and reported a switch out of correspondence.
- The Interlocking Operator exited the Tower, approached the train, and informed the Train Operator that they passed a red signal.
- The Interlocking Operator instructed the Train Operator to move the train after the incident.
- The Interlocking Operator did not report the event to the RTC for over an hour after the occurrence.

### **Immediate Mitigation to Prevent Recurrence**

- ATCM inspected and restored switch 303A.
- The Train Operator was removed from service.
- The Interlocking Operator was removed from service.

### **Probable Cause Statement**

The probable cause of the Red Signal Overrun event at West Falls Church Yard on November 19, 2023, was the Train Operator's misinterpretation of instructions from the Interlocking Operator, and loss of situational awareness by the Train Operator when they failed to stop the train at the instructed location. Contributing factors were bulbs within the red aspects at signal K99-302 required replacement, and the weather, as the forecast reported sunny conditions, which led to the red aspects at signal K99-302 being faintly noticeable, as reported by the Train Operator.

## **Recommended Corrective Actions**

<b>Corrective Action Code</b>	<b>Description</b>	<b>Responsible Party</b>	<b>Estimated Completion Date</b>
112900_SAFE CAPS_RTRA _001	The Train Operator was disqualified from train operations.	RTRA	Completed
112900_SAFE CAPS_ROQT _001	The Interlocking Operator to attend refresher training.	ROQT	Completed
112900_SAFE CAPS_RTRA _002	Re-Instruction to all Interlocking Operators on proper communication relating to instructions at the Administrative Building roadway, and 100% repeat back of instructions.	RTRA	Completed
112900_SAFE CAPS_ATCM _001	Replace bulbs at signal K99-302. Also provide Periodic Maintenance Instructions on how to inspect, clean and test the intensity of light bulbs, clean lenses and repair rail signals.	ATCM	Completed

## Appendices

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

*The below narratives summarize the incident and represent the statements made by the involved individual. 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 9 years of service and less than 1 year of experience as a Train Operator. The Train Operator holds a Roadway Worker Protection (RWP) Level 2 certification that expires in August 2024.

The Train Operator stated that they were fully alert prior to the incident.

The Train Operator stated that they added a two-pack to a 6 pack; they took two cars from 1A took them back to 1B, hooked them up, and made 8 cars revenue-ready. The Train Operator stated that they were given an absolute block to the roadway.

The Train Operator stated that they thought the Interlocking Operator meant the roadway on the west side of the yard because they are usually given instructions to another signal. The Train Operator stated that they usually take the train to signal K99-56, and thought that when the Operators come on duty, they would take the train from the yard.

The Train Operator stated that they were operating safely at normal speed, and when they crossed the roadway, they couldn't tell if the signal was red or lunar, they had no idea what the signal was. The Train Operator stated that the glare of the sun made it hard to tell what the signal was, so they weren't paying attention.

The Train Operator stated that they thought they were given lunar signals all the way around, and when they got to the next single, it was red. The Train Operator stated that they told the Tower and was instructed to stand by, and then they received a lunar.

The Train Operator stated that the Interlocking Operator came out and told them that they ran the red signal. The Train Operator stated that the Interlocking Operator told them to take the train to K99-56, key down reverse, and go to track 10.

The Train Operator stated that if they can't tell what the signal is, they're supposed to stop.

The Train Operator stated that they assumed that the signals were lunar.

The Train Operator stated that after securing the train on track 10, they returned to signal K99-302 and confirmed that the signal was red, but the glare from the sun made the color light.

The Train Operator stated that there were radio communication issues in the yard.

The Train Operator stated that they received training in the yard with Rail Training.

#### Interlocking Operator

The Interlocking Operator is a WMATA employee with 15 years of service and 5 years of experience as an Interlocking Operator. The Interlocking Operator holds a Roadway Worker Protection (RWP) Level 2 certification that expires in January 2024.

The Interlocking Operator stated that they reported for duty on November 18, 2023, at 10:00 PM and were working an overtime shift prior to working their regular scheduled shift.

The Interlocking Operator stated that prior to the incident, they were setting up moves for the Yard Operators. The Interlocking Operator stated that they instructed the Train Operator to get two cars on track 1B, and once the cars were coupled and revenue-ready, the Operator was given a lead to secure them at the roadway.

The Interlocking Operator stated that they were doing paperwork writing down what the Train Operators were doing, and then the Operator informed them that they were holding at K99-134 red. The Interlocking Operator stated that the Operator passed signal K99-302 red, and stopped at the very next signal, which was K99-134.

The Interlocking Operator stated that K99-302 was red and that they did not set a lunar at the signal.

The Interlocking Operator stated that they contacted Central and requested a personal break to go to the train and see what happened. The Interlocking Operator stated that they did not inspect K99-302 because they did not set a lunar at the signal. The Interlocking Operator stated that they asked the Operator why they didn't stop at the roadway, and the Operator replied that they were still going to the roadway. The Interlocking Operator stated that they showed the Operator where the roadway was.

The Interlocking Operator stated that they looked to make sure that the switch was laying in the correct position for the train to still move and confirmed the switch was in the correct position. The Interlocking Operator stated that noticed that the train was blocking the roadway, and not to keep the roadway blocked, they returned to the Tower, then sent the Operator a lead to continue to clear signal K99-68.

The Interlocking Operator stated that they might have set the signal at K99-134 before exiting the Tower.

The Interlocking Operator stated that notified Central and then ATC, and they responded to the yard. The Interlocking Operator stated that they did not notify Central of the red signal overrun because they were not 100% sure if the train had run the red signal.

The Interlocking Operator stated that they noticed the interlocking screen flashing, and that was an indication that the switch was out of correspondence and indicated that a train was going over the switch.

The Interlocking Operator stated that the ATC technician came to the Tower and said that something wasn't right.

The Interlocking Operator stated that they contacted another Interlocking Operator who used to work at the Division for guidance, but they did not help.

The Interlocking Operator stated that they delayed notifying Central about the red signal overrun because they were troubleshooting and trying to figure out exactly what the issue was.



The Interlocking Operator stated that there are two roadways in the yard, and the Operators know the admin building roadway because that is where they park.

The Interlocking Operator stated that they had worked at West Falls Church Yard in the past and that they had returned 3-4 months ago.

# Appendix B – Written Statements

Initial Incident Form		TO BE COMPLETED AND DISTRIBUTED WITHIN 24 HOURS		Page 1 of _____
<b>INCIDENT</b>				
Date 11/19/23	Incident Time N/A	<input type="checkbox"/> AM <input type="checkbox"/> PM	Date/Time Reported 11/19/23 9:30 AM	Worksafe Incident ID#
Location K99 Zone 4			Incident ID# (From ROCC, BOCC, etc.)	
Type of Incident: <input type="checkbox"/> Damage to Property <input type="checkbox"/> Entrapment: <input type="checkbox"/> Elevator <input type="checkbox"/> Disabled Train <input type="checkbox"/> Evacuation <input type="checkbox"/> Fire	<input type="checkbox"/> Flood <input type="checkbox"/> Hazardous Material Incident: <input type="checkbox"/> Detector <input type="checkbox"/> Leak <input type="checkbox"/> Spill <input type="checkbox"/> Near Miss <input type="checkbox"/> Rail Vehicle Collision <input type="checkbox"/> Collision <input type="checkbox"/> Derailment	<input type="checkbox"/> Request for Medical Assistance <input type="checkbox"/> Smoke <input type="checkbox"/> Trespassing SW 303A Trilled	Incident Class <input type="checkbox"/> Injury <input type="checkbox"/> No Loss <input type="checkbox"/> Property Damage <input type="checkbox"/> Other	Injury Class <input type="checkbox"/> Fatality <input type="checkbox"/> Medical Treatment <input type="checkbox"/> First Aid Only <input type="checkbox"/> Restricted Work <input type="checkbox"/> Loss of Consciousness <input type="checkbox"/> Lost Time <input type="checkbox"/> No Treatment
<b>WMATA PERSONNEL INVOLVED</b>				
Name	Age	Employee # or MTPD Badge #		
Phone Number	Job Title	Department	Division/Section	
Last Day Worked (prior to)	Hours Worked (within last 24 hrs)	Overtime?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
11/19/23 00:30-6:30	11 Hrs			
<b>COMPLETE FOR INCIDENTS WITHIN THE RAIL SYSTEM:</b>				
Train/Vehicle ID	Direction	Track #	Car/Vehicle Numbers	Trouble Code
Mezzanine #	AFC Equipment #	Escalator/Elevator #	Entrance	Platform
Track		Room#		
<b>COMPLETE FOR INCIDENTS WITHIN THE BUS SYSTEM</b>				
Bus or Tag Number	Vehicle or Tag Number	Block Number	Run Number	
<b>DESCRIBE THE INCIDENT AND PROPERTY/EQUIPMENT DAMAGE</b>				
Provide factual information about the task, actions before and after the incident, the injury causing agent and any damage caused to property or equipment. Provide a diagram(s) and/or photos as attachments. If necessary, provide diagram in this space or on a separate page.				
While we were performing our PMI at K04, our shift supervisor [redacted] called us & told to come back to the yard for switch 303 OCC. When we arrived, we realize the switch (303A) was trilled. Reported to our shift supervisor.				
<b>EXTERNAL AGENCIES INVOLVED</b>				
<input type="checkbox"/> Fire Dept. – Arrival Time: _____		<input type="checkbox"/> EMS – Arrival Time: _____		
<input type="checkbox"/> Police – Arrival Time: _____		<input type="checkbox"/> Other – Arrival Time: _____		
Name	Badge Number	Complaint Number	Jurisdiction	
Engine Number	Ambulance Number	Hospital		
<b>ACTIONS TAKEN BY SUPERVISOR.</b>				
Describe immediate changes made to address the incident.				
Form completed by (Signature)				Date
[redacted]				11/19/23
Print name	Employee Number	Phone Number		
[redacted]	[redacted]	[redacted]		
Supervisor (Signature)				Date
[redacted]				
Print name	Employee Number	Phone Number		
[redacted]	[redacted]	[redacted]		

53 688 02/10 Original: RISK Copy 1: Kiosk Copy 2: Department Photocopy to SAFE, Employee and other per Department requirements

Document 1 – Incident Report Form (ATCM), Page 1 of 3

Incident Date: 11/19/2023 Time: 09:12 hours  
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Drafted By: SAFE 707 – 11/30/2023  
Reviewed By: SAFE 702 – 05/23/2024  
Approved By: SAFE 707 – 05/29/2024

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Initial Incident Form		TO BE COMPLETED AND		Page 1 of	
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY		DISTRIBUTED WITHIN 24 HOURS			
<b>INCIDENT</b>					
Date 11/19/23	Incident Time 5 AM <input type="checkbox"/> PM	Date/Time Reported 11/19/23 9:30	5 AM <input type="checkbox"/> PM	Worksafe Incident ID#	
Location K99 Zone A			Incident ID# (From ROCC, BOCC, etc.)		
Type of Incident: <input type="checkbox"/> Damage to Property <input type="checkbox"/> Entrainment: <input type="checkbox"/> Elevator <input type="checkbox"/> Disabled Train <input type="checkbox"/> Evacuation <input type="checkbox"/> Fire	<input type="checkbox"/> Flood Hazardous Material Incident: <input type="checkbox"/> Detector <input type="checkbox"/> Leak <input type="checkbox"/> Spill <input type="checkbox"/> Near Miss Rail Vehicle Collision: <input type="checkbox"/> Collision <input type="checkbox"/> Derailment	<input type="checkbox"/> Request for Medical Assistance <input type="checkbox"/> Smoke <input type="checkbox"/> Trespassing SW 303A Trained	Incident Class <input type="checkbox"/> Injury <input type="checkbox"/> No Loss <input type="checkbox"/> Property Damage <input type="checkbox"/> Other	Injury Class <input type="checkbox"/> Fatality <input type="checkbox"/> Medical Treatment <input type="checkbox"/> First Aid Only <input type="checkbox"/> Restricted Work <input type="checkbox"/> Loss of Consciousness <input type="checkbox"/> Lost Time <input type="checkbox"/> No Treatment	
<b>WMATA PERSONNEL INVOLVED</b>					
Name	Age 63	Employee # or MTPD Badge #			
Phone Number	Job Title C Mechanic	Department ATC	Division/Section 2		
Last Day Worked (prior to) 11/19/23	6:30 AM	Hours Worked (within last 24 hrs) 3	Overtime? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
<b>COMPLETE FOR INCIDENTS WITHIN THE RAIL SYSTEM:</b>					
Train/Vehicle ID	Direction	Track #	Car/Vehicle Numbers	Trouble Code	Resp Code
Mezzanine #	AFC Equipment #	Escalator/Elevator #	Entrance	Platform	Track
<b>COMPLETE FOR INCIDENTS WITHIN THE BUS SYSTEM</b>					
Bus or Tag Number	Vehicle or Tag Number	Block Number	Run Number		
<b>DESCRIBE THE INCIDENT AND PROPERTY/EQUIPMENT DAMAGE</b>					
Provide factual information about the task, actions before and after the incident, the injury causing agent and any damage caused to property or equipment. Provide a diagram(s) and/or photos as attachments. If necessary, provide diagram in this space or on a separate page.					
We Performing No PMIs @ K04 Supervisor called go back to K99 yard switch 303 out of Crosstrand. I call Tower as Rvic tower give permit. We go to switch 303-B ask tower to throw switch 303-B moved but 303-A want move					
<b>EXTERNAL AGENCIES INVOLVED</b>					
<input type="checkbox"/> Fire Dept. - Arrival Time: _____		<input type="checkbox"/> EMS. - Arrival Time: _____			
<input type="checkbox"/> Police - Arrival Time: _____		<input type="checkbox"/> Other _____ - Arrival Time: _____			
Name	Badge Number	Complaint Number	Jurisdiction		
Engine Number	Ambulance Number	Hospital			
<b>ACTIONS TAKEN BY SUPERVISOR.</b>					
Describe immediate changes made to address the incident.					
Form completed by (Signature)				Date 11/19/23	
Print name		Employee Number		Phone Number	
Supervisor (Signature)				Date	
Print name		Employee Number		Phone Number	

30.688 02/10 Original: RISX Copy 1: Kiosk Copy 2: Department Photocopy to SAFE, Employee and other per Department requirements

Document 2 - Incident Report Form (ATCM), Page 2 of 3

Incident Date: 11/19/2023 Time: 09:12 hours  
Final Report – Red Signal Overrun  
E23838

Drafted By: SAFE 707 – 11/30/2023  
Reviewed By: SAFE 702 – 05/23/2024  
Approved By: SAFE 707 – 05/29/2024

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<b>INCIDENT</b>	
Date: 11/19/23 Incident Time: N/A AM <input type="checkbox"/> PM <input type="checkbox"/>	Date/Time Reported: 11/19/23 AM <input type="checkbox"/> PM <input type="checkbox"/>
Location: K97 Zone 4	Incident ID# (From ROCC, BOCC, etc.):
Type of Incident: <input type="checkbox"/> Damage to Property <input type="checkbox"/> Entrapment <input type="checkbox"/> Elevator <input type="checkbox"/> Disabled Train <input type="checkbox"/> Evacuation <input type="checkbox"/> Fire <input type="checkbox"/> Flood <input type="checkbox"/> Hazardous Material Incident: <input type="checkbox"/> Detector <input type="checkbox"/> Leak <input type="checkbox"/> Spill <input type="checkbox"/> Near Miss <input type="checkbox"/> Rail Vehicle Collision: <input type="checkbox"/> Collision <input type="checkbox"/> Derailment <input type="checkbox"/> Request for Medical Assistance <input type="checkbox"/> Smoke <input type="checkbox"/> Trespassing SW 303A Trained	Incident Class: <input type="checkbox"/> Injury <input type="checkbox"/> No Loss <input type="checkbox"/> Property Damage <input type="checkbox"/> Other
Injury Class: <input type="checkbox"/> Fatality <input type="checkbox"/> First Aid Only <input type="checkbox"/> Loss of Consciousness <input type="checkbox"/> Lost Time <input type="checkbox"/> No Treatment <input type="checkbox"/> Medical Treatment <input type="checkbox"/> Restricted Work	

<b>WMATA PERSONNEL INVOLVED</b>			
Name: [Redacted]	Age: 64	Employee # or MTPD Badge # [Redacted]	
Phone Number: [Redacted]	Job Title: ATC B Operator	Department: A-TC	Division/Section: 2
Last Day Worked (prior to): 11/19/2023 08:30 - 06:30	Hours Worked (within last 24 hrs): 11	Overtime? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

<b>COMPLETE FOR INCIDENTS WITHIN THE RAIL SYSTEM:</b>					
Train/Vehicle ID	Direction	Track #	Car/Vehicle Numbers	Trouble Code	Resp Code
Mezzanine #	AFC Equipment #	Escalator/Elevator #	Entrance	Platform	Track
					Room#

<b>COMPLETE FOR INCIDENTS WITHIN THE BUS SYSTEM</b>			
Bus or Tag Number	Vehicle or Tag Number	Block Number	Run Number

**DESCRIBE THE INCIDENT AND PROPERTY/EQUIPMENT DAMAGE**  
 Provide factual information about the task, actions before and after the incident, the injury causing agent and any damage caused to property or equipment. Provide a diagram(s) and/or photos as attachments. If necessary, provide diagram in this space or on a separate page.

We arrived from K09, when [Redacted] supervisor called to check on switch 303. When doing switch 303A exercised. We realize 303A trailed. AA [Redacted] reported to supervisor - [Redacted]

<b>EXTERNAL AGENCIES INVOLVED</b>			
<input type="checkbox"/> Fire Dept. - Arrival Time: _____	<input type="checkbox"/> EMS - Arrival Time: _____		
<input type="checkbox"/> Police - Arrival Time: _____	<input type="checkbox"/> Other - Arrival Time: _____		
Name	Badge Number	Complaint Number	Jurisdiction
Engine Number	Ambulance Number	Hospital	

**ACTIONS TAKEN BY SUPERVISOR.**  
 Describe immediate changes made to address the incident.

Form complete: [Redacted]	Date: 11/19/23
Print name: [Redacted]	Employee Number: [Redacted]
Supervisor (Signature): [Redacted]	Date: [Redacted]
Print name: [Redacted]	Employee Number: [Redacted]
	Phone Number: [Redacted]

30.689 02/10 Original: RISX Copy 1: Kiosk Copy 2: Department Photocopy to SAFE, Employee and other per Department requirements

Document 3 - Incident Report Form (ATCM), Page 3 of 3

Incident Date: 11/19/2023 Time: 09:12 hours  
 Final Report – Red Signal Overrun  
 E23838

Drafted By: SAFE 707 – 11/30/2023  
 Reviewed By: SAFE 702 – 05/23/2024  
 Approved By: SAFE 707 – 05/29/2024

# Appendix C – Certifications



## TRAIN OPERATOR AND ROAD SUPERVISOR JOB TASK PROFICIENCY EVALUATION



Name: [REDACTED]	Emp.No: [REDACTED]	Division: Rail Training	Date: 1-4-2023
------------------	--------------------	-------------------------	----------------

Reason for Certification: *Please place a check in an area below.*

Certification: Student     Pre-certification: Student     Division Request     Re-Certification     Return to Duty     Other \_\_\_\_\_

Exam Administered	Score	Date Taken	Equipment (current/working condition)	Yes	No
MSRPH version #:	86 %	12-9-2022	MSRPH		
TVOIM/TOIM	81 %	12-9-2022	Perm/Temp/Special Orders		
Supervisor Combination	%		Troubleshooting Guide	✓	
Practical attempt #: 1	OL- 1	1-4-2023	Flashlight		
			Safety Vest	✓	
			Footwear	✓	
			Identification (One Badge, RWP)		

Comments

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Signatures:	Date:
Employee: [REDACTED]	1-4-23
Examiner: [REDACTED]	1-4-2023

CATEGORIES / SUBCATEGORIES	QUALITY LEVEL	REMARKS (Remarks are required for a quality level score of 2 or 3)
<b>I. Preparation for Service</b>		
1. Exterior Inspection	1	Cars Used: 7456 7453 7472 7357
2. Interior Inspection - Trailing Cab	1	(7473) BCO (7357) Rotary Drum
3. Interior Inspection - Each Car	1	(7472) Horn C10
4. Interior Inspection - Oper. Cab	1	(7357) Compartment Oper
5. Rolling Test / Rolling Brake Test	1	(7356) Tail Marker C1B
		Time Allotted: 35:00 / Actual Time: :33 min
<b>II. Mainline Operation</b>		
6. Communications	1	
7. Door Oper. & Station Stopping	1	
8. Use of Horn	1	
9. Speed Adherence/Manual Oper.	1	
10. Turn Back Moves	1	Location: Grosvenor Time Allotted: 02:00 / Actual Time: :03min
11. Manual Route Selection	1	Location: A15 02
12. EV Shutoff	1	Time Allotted: 00:30 (1:00) / Actual Time: :03seconds
<b>III. Yard Operation</b>		
13. Communications	1	
14. Yard Movements	1	
15. Coupling	1	Time Allotted: 08:00 (12) / Actual Time: :06min Cars Used: 7457 + 7453
16. Uncoupling	1	Time Allotted: 05:00 (7.5) / Actual Time: :04min Cars Used: < 7452 > 7472
17. Isolation (Self-Recovery)	1	Time Allotted: 15:00 (22.5) / Actual Time: :14min Cars Used: 7452 / 7472
18. Manual Switch Operation	1	87 (A99)
<b>IV. Miscellaneous</b>		
19. Recovery Train Operation	1	Time Allotted: 12:00 (18) / Actual Time: :11min Cars Used: 7472 + 7452
20. Troubleshooting	1	Problem#1 (7453) Passenger Door 1034-1038 :04 min
	1	Problem#2 (7457) Car Isolation 1041-1044 :03 min



# TRAIN OPERATOR AND ROAD SUPERVISOR JOB TASK PROFICIENCY EVALUATION



Name: [REDACTED]	Emp.No: [REDACTED]	Division: West Falls	Date: August 5, 2022
------------------	--------------------	----------------------	----------------------

Reason for Certification: <i>Please place a check in an area below.</i>	Training Time Received: <i>Please record training time in an area below.</i>
<input type="checkbox"/> Certification: Student <input type="checkbox"/> Pre-certification: Student <input type="checkbox"/> Division Request <input checked="" type="checkbox"/> Re-Certification <input type="checkbox"/> Return to Duty <input type="checkbox"/> Other _____	Rail Training: Weeks: _____ Days: _____ Hours: _____ OJT: _____ Division Training: Weeks: _____ Days: _____ Hours: _____ OJT: _____ <small>NOTE: OJT time is not separate from Weeks/Days/Hours.</small>

Exam Administered	Score	Date Taken	Equipment (current/working condition)	Yes	No
MSRPH version #:	88%	August 5, 2022	MSRPH	X	
TVOIM/TOIM	84%	August 5, 2022	Perm/Temp/Special Orders	X	
Supervisor Combination	%		Troubleshooting Guide	X	
Practical attempt #: 1	QL- 1	August 5, 2022	Flashlight	X	
			Safety Vest	X	
			Footwear	X	
			Identification (One Badge, RWP) 10/22	X	

Corrective Actions Required	Date Due	Complete	Initials
Forwarded to:	Date:	August 5, 2022	

Certification Information: <i>To be completed by QA/QC Staff</i>		Signatures:	Date:
Emp. No: [REDACTED]	Date of Birth: [REDACTED]	Employee: [REDACTED]	August 5, 2022
Date Last Qualified:	Certification Class:	Examiner: [REDACTED]	August 5, 2022
Due Date Next Qualification:	Corrective Lenses: N	Reviewed by: [REDACTED]	
Date Qualification Expires:	Restrictions:		

*Document 6 - Train Operation Certification for the Interlocking Operator, Page 1 of 2*

Incident Date: 11/19/2023 Time: 09:12 hours  
Final Report – Red Signal Overrun  
E23838

Drafted By: SAFE 707 – 11/30/2023  
Reviewed By: SAFE 702 – 05/23/2024  
Approved By: SAFE 707 – 05/29/2024

CATEGORIES / SUBCATEGORIES	QUALITY LEVEL	REMARKS (Remarks are required for a quality level score of 2 or 3) – ALL TIMES (are in minutes)
<b>I. Preparation for Service</b>		
		Cars Used: 7496-7315
1. Exterior Inspection	QL-1	Rotary drum switch 7497 Brake pipe trainline c/o valve 7496 Barrier hanging 7315
2. Interior Inspection - Trailing Cab	QL-1	ATP no seal 7314
3. Interior Inspection - Each Car	QL-1	Door valance 1&2 7314 Headlight c/b 7497
4. Interior Inspection - Oper. Cab	QL-1	Door interlock no seal 7496
5. Rolling Test / Rolling Brake Test	QL-1	
		Time Allotted: 35:00 / Actual Time: 23:19 :
<b>II. Mainline Operation</b>		
6. Communications	QL-1	Communicated with K99 tower & Ops 4
7. Door Oper. & Station Stopping	QL-1	K05
8. Use of Horn	QL-1	
9. Speed Adherence/Manual Oper.	QL-1	
10. Turn Back Moves	QL-1	Location: K04 Time Allotted: 02:00 / Actual Time: :47 :
11. Manual Route Selection	QL-1	Location: K04 04
12. EV Shutoff	QL-1	Time Allotted: 00:30 (01:00) / Actual Time: :08:
<b>III. Yard Operation</b>		
13. Communications	QL-1	Communicated with K99 tower
14. Yard Movements	QL-1	
15. Coupling	QL-1	Time Allotted: 08:00 (12:00) / Actual Time: 5:30: Cars Used:7085+7233 +
16. Uncoupling	QL-1	Time Allotted: 05:00 (07:30) / Actual Time: :3:22 Cars Used: <7314-7232 >
17. Isolation (Self-Recovery)	QL-1	Time Allotted: 15:00 (22:30) / Actual Time: 13:22: Cars Used: 7496-7315-7232-7085
18. Manual Switch Operation	QL-1	Switch 127
<b>IV. Miscellaneous</b>		
19. Recovery Train Operation	QL-1	Time Allotted: 12:00 (18:00) / Actual Time: 7:17: Cars Used: 7496-7315-7232-7085 +
20. Troubleshooting	QL-1	No all doors closed (EEDR) 7315 Actual time: 4:28
	QL-1	BIE mushroom depressed (7232) Actual time: 2:13





# INTERLOCKING AND TERMINAL SUPERVISOR JOB TASK PROFICIENCY EVALUATION



Name:		Emp. No.:		Division: <i>West Falls</i>	Date: <i>3/13/22</i>
-------	--	-----------	--	-----------------------------	----------------------

Reason for Certification: <i>Please place a check in an area below.</i>	Training Time Received: <i>Please record training time in an area below.</i>
<input type="checkbox"/> Certification: Student <input type="checkbox"/> Pre-certification: Student <input type="checkbox"/> Division Request <input checked="" type="checkbox"/> Re-Certification <input type="checkbox"/> Return to Duty <input type="checkbox"/> Other _____	Rail Training: Weeks: _____ Days: _____ Hours: _____ OJT: _____ Division Training: Weeks: _____ Days: _____ Hours: _____ OJT: _____ <small>NOTE: OJT time is not separate from Weeks/Days/Hours.</small>

Exam Administered	Score	Date Taken	Equipment ( <i>current/working condition</i> )	Yes	No
Terminal Procedures	%		MSRPH	✓	
Interlocking Procedures	%		Perm/Temp/Special Orders	✓	
Practical attempt #: <i>1</i>	QL- <i>1</i>	<i>3/13/22</i>	Troubleshooting Guide	✓	
			Flashlight	✓	
			Safety Vest	✓	
			Footwear	✓	
			Identification (WMATA, RWP)	✓	

Corrective Actions Required	Date Due	Complete	Initials
Forwarded to:	Date:		

Certification Information: <i>To be completed by QA/QC Staff</i>		Signatures:	Date:
Emp. No.:	Date of Birth:	Employee:	<i>3/13/22</i>
Date Last Qualified: <i>3/13/22</i>	Certification Class: <i>A</i>	Examiner:	<i>3/13/22</i>
Due Date Next Qualification:	Corrective Lenses: <i>N/A</i>	Reviewed by:	
Date Qualification Expires:	Restrictions: <i>N/A</i>		

*Document 8 – Interlocking Operator Certification for the Interlocking Operator, Page 1 of 2*

Incident Date: 11/19/2023 Time: 09:12 hours  
 Final Report – Red Signal Overrun  
 E23838

Drafted By: SAFE 707 – 11/30/2023  
 Reviewed By: SAFE 702 – 05/23/2024  
 Approved By: SAFE 707 – 05/29/2024

CATEGORIES / SUBCATEGORIES	QUALITY LEVEL	REMARKS (Remarks are required for a quality level score of 2 or 3)
<b>Terminal Operations</b>		
I. Command, Control & Coordination of Terminal Operations		Terminal Location: _____
1. Interlocking Panel Operations		
2. Communication		
3. Problem Solving		Problem 1: _____
		Problem 2: _____
4. RPM System Operations		
5. Terminal Documentation		
<b>II. Manual Terminal Operations</b>		
6. Manual Switch Operations		
<b>Interlocking Operations</b>		
1. Manual Switch Operations	1	
2. Interlocking Panel Operations	1	
3. RPM System Operations	1	
4. Yard Power Panel Operations	1	
5. Problem Solving	1	Problem 1: <i>Down Problem</i>
	1	Problem 2: <i>Switch Out consequences # (313)</i>
6. Documentation	1	
7. Communication	1	
8. Yard and Shop Moves	1	



Recorded Event Data:				
Time	Location	Status/Control	AIMS DESCRIPTION	Comments
==	===	=====	=====	=====

Alarm Status

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

**Comment:**

Data Regarding Red Signal 302 Overrun and Trailed Switch 303A could not be found due to a Server Synchronization error between two redundant servers at K99/West Falls Church Yard.

Server A and B experienced a fault on the 15<sup>th</sup> of November and data between this failure and the 20<sup>th</sup> of November when ATC Engineer [REDACTED] contacted RailComm to resolve the issue has been lost.

=====

Distribution:



Original  
11/21/2023

Incident Report 0.0  
Page 2 of 2

K99 RED Signal (302-SIG) and Switch 303A Trailed Investigation report

Document 11 - ATCE Oracle Report, Page 1 of 2

# Appendix E – Maximo Reports



## Washington Metropolitan Area Transit Authority Maintenance and Material Management System Work Order Details

Page 1 of 2  
MX76PROD

Work Order #: 18246240  
Type: CM



Status: CLOSE  
11/20/2023 07:23

Work Description: K99\_ Switch 303A has been trailed  
Job Plan Description:

Work Information			
Asset: 59423	ATCS, K99, YARD SWITCHES	Owning Office: ATCS-TSSM-KRFO	Parent:
Asset Tag:		Maintenance Office: ATCS-TSSM-SWSH	Create Date: 11/19/2023 11:10
Asset S/N: K99.ATCS.YARD SWITCHES		Labor Group: ATCS2K99	Actual Start: 11/19/2023 14:20
Location: 2652	K96, WEST FALLS CHURCH YARD, BUILDING (B) TOWER, 2ND FLOOR, ROOM 2-2, TRAIN CONTROL ROOM (K99 TCR1)	Crew:	Actual Comp: 11/20/2023 07:23
Work Location:		Lead:	Item: ATCSV0015
Failure Class: ATCS001	SWITCH MACHINES	GL Account: WMATA-02-33530-50499270-042-*****-OPR**	Target Start:
Problem Code: 2581	OUT OF CORRESPONDENCE	Supervisor:	Target Comp:
Requested By: [REDACTED]		Requestor Phone:	Scheduled Start:
Chain Mark Start:		Chain Mark End:	
Create-Mileage: 0.0		Complete-Mileage: 0.0	

**Task IDs**

Task ID	Description	Component:	Work Accomp:	Reason:	Status:	Position:	Warranty?:
10	Dayshift K99 11/19/23  This morning K99 towner reported (about 9:31 AM) that SW 303 OOC. At 9:34 AM I did call my crews at K04 (Doing K04 PMI HFTC) to come back the yard. About 10:27 AM, ATC [REDACTED] called me and informed that SW 303A was trailed, but found no damaged internal or external. AT that time I was at K06 TCR with [REDACTED] doing compliance level 1-A. I asked my crews to standby then [REDACTED] and I went to K99 towner to pull out the record. Unfortunately, we were not able to pull it out from computer. Per K99 towner, he was never set lunar signal 302, and Train Operator overran red signal 302. This happen between 8:30 Am to 9:00 AM.  I did contact Safety Office at 11:08 AM, and [REDACTED] arrived K99 yard at 12:30 PM. After he talked with K99 towner then we escorted him to roadway SW 303A and he took some pics and ask couples question about SW 303A. After he left, we pried SW 303A from Normal to Reverse and SW 303A back in corresponded. We did follow Trailed SW check list and performed :  Switch Obstruction Track Circuit Testing Signal Light testing Switch Detector and Route Locking test Switch Indication locking test  All OK.  Updated WO: 18246240  Placed SW 303A back in service				CLOSE		N

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11/20/2023 10:27

Document 12 – Maximo Report #18246240 (ATCM), Page 1 of 2

Incident Date: 11/19/2023 Time: 09:12 hours  
Final Report – Red Signal Overrun  
E23838

Drafted By: SAFE 707 – 11/30/2023  
Reviewed By: SAFE 702 – 05/23/2024  
Approved By: SAFE 707 – 05/29/2024

Page 35



Washington Metropolitan Area Transit Authority  
Maintenance and Material Management System  
**Work Order Details**

Work Order #: 18246240  
Type: CM



Status: CLOSE  
11/20/2023 07:23

Work Description: K99\_ Switch 303A has been trailed  
Job Plan Description:

Actual Labor										
Task ID	Labor	Start Date	End Date	Start Time	End Time	Approved?	Regular Hours	Premium Hours	Line Cost	
10		11/19/2023	11/19/2023	09:30	14:30	Y	05:00	00:00	\$246.21	
10		11/19/2023	11/19/2023	09:30	14:30	Y	05:00	00:00	\$219.21	
10		11/19/2023	11/19/2023	09:30	14:30	Y	05:00	00:00	\$223.35	
10		11/19/2023	11/19/2023	09:30	14:30	Y	05:00	00:00	\$270.12	
<b>Total Actual Hour/Labor:</b>							20:00	00:00	<b>\$958.90</b>	

Failure Reporting			
Cause	Remedy	Supervisor	Remark Date
3453 TRAILED SWITCH	3454 RESTORED TO PROPER POSITION		11/19/2023
Remarks: See Task for detail			

Incident Date: 11/19/2023 Time: 09:12 hours  
Final Report – Red Signal Overrun  
E23838

Drafted By: SAFE 707 – 11/30/2023  
Reviewed By: SAFE 702 – 05/23/2024  
Approved By: SAFE 707 – 05/29/2024



Washington Metropolitan Area Transit Authority  
Maintenance and Material Management System  
**Work Order Details**

Work Order #: 18265862  
Type: TST



Status: CLOSE  
12/03/2023 22:11

Work Description: K99, Safety request Radio Operational test in Yard and check at West Falls Church Yard to include but not limited to tracks 1A and 1B

Job Plan Description:

Please extend test to OPS#3

Work Information

<b>Asset:</b> 60090	RADIO, CRCS, T53	<b>Owning Office:</b> COMM-TSSM-RADO	<b>Parent:</b>
<b>Asset Tag:</b>		<b>Maintenance Office:</b> COMM-TSSM-RADO	<b>Create Date:</b> 11/30/2023 08:17
<b>Asset S/N:</b> CRCST53		<b>Labor Group:</b> COMMR3RADO	<b>Actual Start:</b> 12/01/2023 13:11
<b>Location:</b> 7025	T53, CRCS RADIO ANTENNA SITE, RESTON INTERNATIONAL CENTER	<b>Crew:</b>	<b>Actual Comp:</b> 12/01/2023 13:11
<b>Work Location:</b>		<b>Lead:</b> [REDACTED]	<b>Item:</b> N60040084
<b>Failure Class:</b> COMR003	RADIO COMMUNICATIONS SYSTEMS	<b>GL Account:</b> WMATA-02-33540-50499280-042-*****-*****-OPR**	
<b>Problem Code:</b> 3669	COMMS FAILURE	<b>Supervisor:</b> [REDACTED]	<b>Target Start:</b>
<b>Requested By:</b> 55385		<b>Requestor Phone:</b> [REDACTED]	<b>Target Comp:</b>
			<b>Scheduled Start:</b>
<b>Create-Mileage:</b> 0.0		<b>Complete-Mileage:</b> 0.0	

Task IDs

Task ID	Description
10	Radio checks performed..
	Radio checks loud and clear 95% of the time in the K99 Yard. Checked with Tower Supervisor as to where the overrun took place. Performed radio checks at that signal. That also was loud and clear. Also went to West Falls Church K06 and performed radio checks along the platform, those checks were loud and clear both tracks 1& 2 inbound and outbound with exception of one area inbound side tk1 that has a garage in the area.

Component: Work Accompl: Reason: Status: CLOSE Position: Warranty?: N

Actual Labor

Task ID	Labor	Start Date	End Date	Start Time	End Time	Approved?	Regular Hours	Premium Hours	Line Cost
10	[REDACTED]	12/01/2023	12/01/2023	08:00	13:00	Y	05:00	00:00	\$258.22
<b>Total Actual Hour/Labor:</b>							05:00	00:00	\$258.22

Failure Reporting

Cause	Remedy	Supervisor	Remark Date
2771 RADIO RECEPTION PROBLEM	3191 TESTED - NO TROUBLE FOUND	[REDACTED]	12/01/2023

Remarks: Radio Operational test in Yard K99 and K06 performed.



**Washington Metropolitan Area Transit Authority**  
**Maintenance and Material Management System**  
**Work Order Details**

Work Order #: 18246243  
Type: CM



Status: CLOSE  
11/29/2023 11:07

Work Description: Red signal overrun at K99-302 signal at Wes Falls Church Yard., 0/0, K99, RTR, RSIG, 000  
Job Plan Description:

**Work Information**

<b>Asset:</b> R7594	7594, RAIL CAR, KAWASAKI, 7000 AC, A CAR	<b>Owning Office:</b> CMNT-CMNT-CMNT	<b>Parent:</b>
<b>Asset Tag:</b> R7594		<b>Maintenance Office:</b> CMNT-ALEX-INSP	<b>Create Date:</b> 11/19/2023 11:29
<b>Asset S/N:</b> 7594		<b>Labor Group:</b> CMNT	<b>Actual Start:</b> 11/19/2023 11:30
<b>Location:</b> 1213	C99, ALEXANDRIA YARD	<b>Crew:</b>	<b>Actual Comp:</b> 11/19/2023 21:51
<b>Work Location:</b> 2494	K99, WEST FALLS CHURCH YARD	<b>Lead:</b>	<b>Item:</b> K18050001
<b>Failure Class:</b> CMNT001	RAIL CAR	<b>GL Account:</b> WMATA-02-33350-50499160-041-*****-OPR**	<b>Target Start:</b>
<b>Problem Code:</b> 2424	N/A CODE (GENERAL SYMPTOM)	<b>Supervisor:</b> [REDACTED]	<b>Target Comp:</b>
<b>Requested By:</b>		<b>Requestor Phone:</b> [REDACTED]	<b>Scheduled Start:</b>
<b>Chain Mark Start:</b>		<b>Chain Mark End:</b>	
<b>Create-Mileage:</b> 354163.0		<b>Complete-Mileage:</b> 354163.0	

**Task IDs**

Task ID	Description	Component	Work Accomplished	Reason	Status	Position	Warranty
10	SEE DETAILS: CHECKED FOR WHEEL FLATS ON TRAIN REPORTED FOR RED SIGNAL OVERRUN. NO FLATS FOUND, TRAIN OK FOR SERVICE	000-300-K03-002 WHEEL; TRUCK; 2K/3K/6K/7K	INSPECTED	INCIDENT//ACCIDENT	CLOSE	213	N
20	SEE DETAILS BELOW. PERFORMED A MASTER CONTROL OPERATION CHECK AND CHECKED THAT BRAKE RATES WERE IN SPEC ON CAR THAT HAD RED SIGNAL OVER RUN. THE MASTER CONTROLLER OPERATES PROPERLY AND THE BRAKE RATES ARE IN SPEC. ALSO RAN A DST. OPS GOOD. TRAIN READY FOR SERVICE.	000-300-D01-005 MASTER CONTROLLER ASSY	CHECKED	NO TROUBLE FOUND	CLOSE		N

**Actual Labor**

Task ID	Labor	Start Date	End Date	Start Time	End Time	Approved?	Regular Hours	Premium Hours	Line Cost
10	[REDACTED]	11/19/2023	11/19/2023	13:00	13:10	Y	00:10	00:00	\$7.41
10	[REDACTED]	11/19/2023	11/19/2023	13:00	13:10	Y	00:10	00:00	\$8.21
20	[REDACTED]	11/19/2023	11/19/2023	19:30	20:00	Y	00:30	00:00	\$21.60
<b>Total Actual Hour/Labor:</b>							00:50	00:00	\$37.22

**Related Incidents**

Ticket	Description	Class	Status	Relationship
8711700	Red signal overrun at K99-302 signal at Wes Falls Church Yard., 0/0, K99, RTR, RSIG, 000	SR	CLOSED	ORIGINATOR





**Washington Metropolitan Area Transit Authority**  
**Maintenance and Material Management System**  
**Work Order Details**

Work Order #: 18246243  
 Type: CM



Status: CLOSE  
 11/29/2023 11:07

Work Description: Red signal overrun at K99-302 signal at Wes Falls Church Yard., 0/0, K99, RTR, RSIG, 000

Job Plan Description:

Failure Reporting				
Cause	Remedy	Supervisor	Remark	Date
2475	NO DEFECT; NO REPAIRS PERFORMED	3192	TESTED / INSPECTED	11/19/2023
Remarks: All IIT recommendations complied with, no problem found, good DI. Ok for service.				

Incident Date: 11/19/2023 Time: 09:12 hours  
 Final Report – Red Signal Overrun  
 E23838

Drafted By: SAFE 707 – 11/30/2023  
 Reviewed By: SAFE 702 – 05/23/2024  
 Approved By: SAFE 707 – 05/29/2024



**Washington Metropolitan Area Transit Authority  
Maintenance and Material Management System  
Work Order Details**

Work Order #: 18341940  
Type: CM



Status: CLOSE  
01/11/2024 23:29

Work Description: K99, Tower reported dim top and bottom red aspect on signal 302  
Job Plan Description:

Work Information			
<b>Asset:</b> 835011	ATCS, K99-302 SIGNAL SYSTEM, YARD MAINLINE, VE	<b>Owning Office:</b> ATCS-TSSM	<b>Parent:</b>
<b>Asset Tag:</b>		<b>Maintenance Office:</b> ATCS-TSSM-KRFO	<b>Create Date:</b> 01/10/2024 20:09
<b>Asset S/N:</b>		<b>Labor Group:</b> ATCSD4K99	<b>Actual Start:</b> 01/10/2024 21:34
<b>Location:</b> 2652	K96, WEST FALLS CHURCH YARD, BUILDING (B) TOWER, 2ND FLOOR, ROOM 2-2, TRAIN CONTROL ROOM (K99 TCR1)	<b>Crew:</b>	<b>Actual Comp:</b> 01/11/2024 05:31
<b>Work Location:</b>		<b>Lead:</b>	<b>Item:</b> ATCSV9930
<b>Failure Class:</b> ATCS013	SIGNALS / SIGNS	<b>GL Account:</b> WMATA-02-33530-50499270-042-*****-****-OPR**	
<b>Problem Code:</b> 5024	SIGNAL DARK	<b>Supervisor:</b>	<b>Target Start:</b>
<b>Requested By:</b> [REDACTED]		<b>Requestor Phone:</b>	<b>Target Comp:</b>
<b>Chain Mark Start:</b>		<b>Chain Mark End:</b>	<b>Scheduled Start:</b>
<b>Create-Mileage:</b> 0.0		<b>Complete-Mileage:</b> 0.0	

**Task IDs**

Task ID	Description	Status	Position	Warranty?
10	K99 Eve. Burnt bulb for each red aspect. <small>No more spare light bulbs at K99 yard. Found some at C99. Need to go C99 pick up and continue troubleshooting. Replaced the burnt bulb, 01/11/24</small>	CLOSE		N

Component:	Work Accomp:	Reason:	Status:	Position:	Warranty?:
20	K99 Mids Bulbs Replaced		CLOSE		N

Component:	Work Accomp:	Reason:	Status:	Position:	Warranty?:
			CLOSE		N

**Planned Materials**

Task ID	Item	Description	Storeroom	Issue Unit	Quantity	Unit Cost	Line Cost
	R62400027	LAMP:SIGNAL MINIATURE, 10V	254	EA	7	\$0.40	\$2.80
<b>Total Planned Materials:</b>							\$2.80

**Actual Labor**

Task ID	Labor	Start Date	End Date	Start Time	End Time	Approved?	Regular Hours	Premium Hours	Line Cost
10	[REDACTED]	01/10/2024	01/10/2024	20:30	22:00	Y	01:30	00:00	\$63.21
10	[REDACTED]	01/10/2024	01/10/2024	20:30	22:00	Y	01:30	00:00	\$64.79

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01/13/2024 05:40

Document 17 - Maximo Report #18341940 (ATCM), Page 1 of 2

Incident Date: 11/19/2023 Time: 09:12 hours  
Final Report – Red Signal Overrun  
E23838

Drafted By:	SAFE 707 – 11/30/2023
Reviewed By:	SAFE 702 – 05/23/2024
Approved By:	SAFE 707 – 05/29/2024



Washington Metropolitan Area Transit Authority  
Maintenance and Material Management System  
Work Order Details

Work Order #: 18341940  
Type: CM



Status: CLOSE  
01/11/2024 23:29

Work Description: K99, Tower reported dim top and bottom red aspect on signal 302

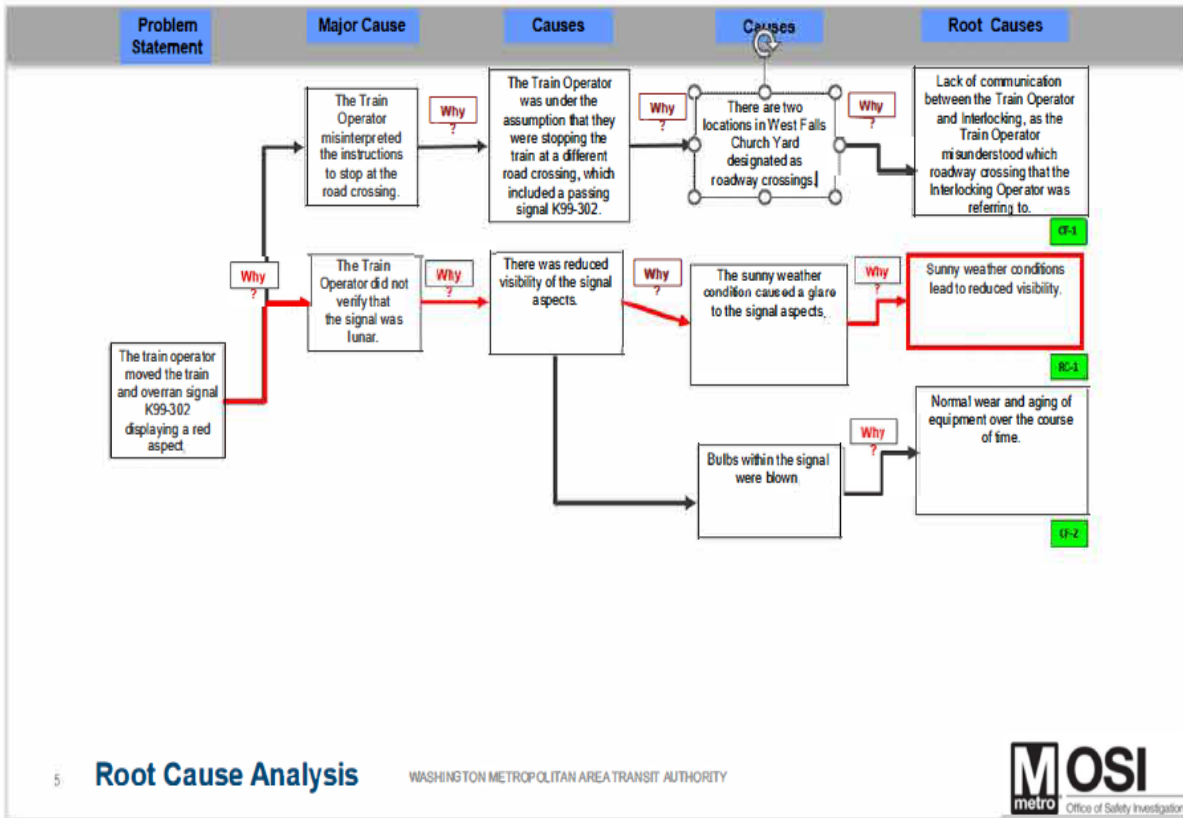
Job Plan Description:

Actual Labor										
Task ID	Labor	Start Date	End Date	Start Time	End Time	Approved?	Regular Hours	Premium Hours	Line Cost	
10	E020408	01/10/2024	01/10/2024	20:30	22:00	Y	01:30	00:00	\$63.53	
	E007638	01/11/2024	01/11/2024	01:00	02:00	Y	01:00	00:00	\$45.35	
	E053037	01/11/2024	01/11/2024	01:00	02:00	Y	01:00	00:00	\$37.93	
	E037842	01/11/2024	01/11/2024	01:00	02:00	Y	01:00	00:00	\$43.19	
<b>Total Actual Hour/Labor:</b>							07:30	00:00	\$318.01	

Actual Materials									
Task ID	Item	Assetnum	Description	Storeroom	Trans Date	Issue Unit	Quantity	Unit Cost	Line Cost
	R62400027		LAMP-SIGNAL MINIATURE, 10V	254	01/10/2024	EA	7	\$0.40	\$2.80
<b>Total Actual Materials:</b>									\$2.80

Failure Reporting				
Cause	Remedy	Supervisor	Remark Date	
1256 BULB BURNED OUT	2819 REMOVED & REPLACED FAILED PART		01/10/2024	
Remarks: Found bad bulb, no spare light bulbs at K99. C99 has some. Need to pick up at C99				

# Appendix F – Why-Tree Analysis



## 5 Root Cause Analysis

WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY





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

**FINAL REPORT OF INVESTIGATION A&I E23847**

<b>Date of Event:</b>	November 25, 2023
<b>Type of Event:</b>	O-8: Red Signal Overrun
<b>Incident Time:</b>	14:12 hours
<b>Location:</b>	Spring Hill Station, Track 2
<b>Time and How received by SAFE:</b>	14:14 hours – MAC Desk
<b>WMSC Notification Time:</b>	16:10 hours
<b>Responding Safety Officers:</b>	Office of Safety Investigations (OSI)
<b>Rail Vehicle:</b>	Train ID 613 (L7608-09x7537-38x7510-11x7505-04T)
<b>Injuries:</b>	None
<b>Damage:</b>	None
<b>Emergency Responders:</b>	Metro Transit Police Department (MTPD) Emergency Response Team (ERT)
<b>SMS I/A Number</b>	20231126#113014

# Spring Hill Station – Red Signal Overrun

November 25, 2023  
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## **Abbreviations and Acronyms**

<b>AIMS</b>	Advanced Information Management System
<b>ARS</b>	Audio Recording System
<b>ATC</b>	Office of Automatic Train Control
<b>CCTV</b>	Closed-Circuit Television
<b>CMOR</b>	Office of Chief Mechanical Officer
<b>ER</b>	Event Recorder
<b>ERT</b>	Emergency Response Team
<b>IIT</b>	Incident Investigation Team
<b>MAC</b>	Mission Assurance Coordinator
<b>MOR</b>	Metrorail Operating Rulebook
<b>MTPD</b>	Metro Transit Police Department
<b>OSI</b>	Office of Safety Investigations
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<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>TRST</b>	Office of Track and Structures
<b>VMDS</b>	Vehicle Monitoring and Diagnostic 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 Saturday, November 25, 2023, at 07:04 hours, the Radio Rail Traffic Controller (RTC) announced over Radio Ops 4 that trains were single-tracking between Spring Hill and Wiehle-Reston Stations on track 2, and track 1 was out of service.

At 14:04 hours, Train ID 613, a Silver line, eight-car 7000 series train, entered the platform limits at Spring Hill Station on track 2, traveling at 16 MPH. Train ID 613 came to a complete stop four feet from the eight-car marker, and then stop and proceed mode was initiated to move to the eight-car marker. After servicing the station, the Radio RTC instructed the Train Operator to hold on the platform due to another train coming through the single tracking area.

At 14:09 hours, the Radio RTC instructed the Train Operator to close and continue and granted a permissive block no closer than ten feet to signal N04-08. The Train Operator gave the Radio RTC a repeat back, but the audio was low, so it was difficult to determine if the transmission was a 100 percent repeat back. The Train Operator was under the assumption that the Radio RTC gave them a permissive block to the next station. Instead of stopping ten feet before signal N04-08, the Train Operator continued to the next station. This resulted in the Train Operator overrunning the red signal at N04-08.

RTRA removed the Train Operator from service. The train was removed from service for post-incident inspection.

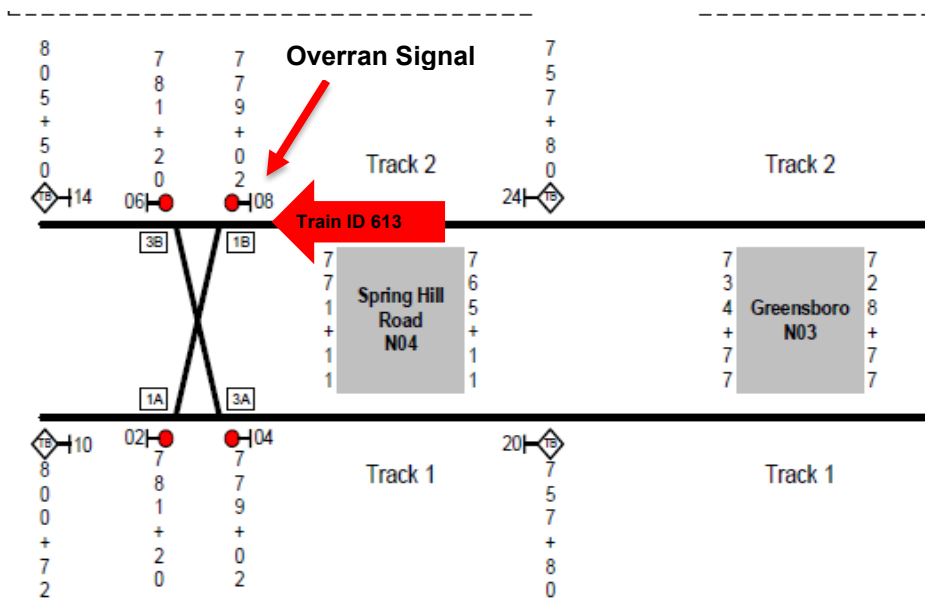
The probable cause of the Red Signal Overrun on November 25, 2023, at Spring Hill Station, track 2, was a lack of effective communication. The Train Operator misunderstood the Radio RTC instructions to proceed no closer than ten feet to signal N04-08.

**Incident Site**

This is an outdoor station with direct fixation tracks. The station has a center platform and an interlocking on the outbound end 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:

- Physical site assessment
- Formal Interview – SAFE interviewed one individual as part of this investigation. The interview 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 individual:
  - Train Operator
- 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 record systems. These records include:
  - Metrorail Operating Rulebook (MOR)
  - National Oceanic and Atmospheric Administration (NOAA)
  - 30-Day Work History
  - Training Records
  - Train Operator Certification Records
  - ROCC Report
  - ATCM Incident Timeline Report

- ATCM Interlocking Inspection
- System Data Recording Review – A collection of information contained in Metro Data Recording Systems. This data includes:
  - Audio Recording System (ARS) playback, including Ops. 4 Radio, Silver Line Phone, MAC Desk Line
  - Closed-Circuit Television (CCTV)
  - SPOTS Report
  - VMDS Data

## **Investigation**

On November 25, 2023, at 04:34 hours, the Radio RTC permitted an Office of Track and Structure (TRST) work crew to perform concrete tie replacement between N1 780+00 to 897+00. At 07:04 hours, the Radio RTC announced over Radio Ops 4 that trains were single-tracking between Spring Hill and Wiehle-Reston Stations on track 2, and track 1 was out of service.

At 14:04 hours, Train ID 613, a Silver line, eight-car 7000 series train, entered the platform limits at Spring Hill Station on track 2, traveling at 16 MPH. Train ID 613 came to a complete stop four feet from the eight-car marker, and stop and proceed mode was initiated to move to the eight-car marker.

At 14:06 hours, after servicing the station, the Radio RTC instructed the Train Operator of Train ID 613 to hold on the platform due to another train coming through the single tracking area. At 14:09 hours, the Radio RTC instructed the Train Operator to close and continue and granted a permissive block no closer than ten feet to signal N04-08. The Train Operator gave the Radio RTC a repeat back, but the audio was low, so it was difficult to determine if the transmission was a 100 percent repeat back.

At 14:12 hours, an AIMS alarm alerted the Radio RTC to ask the Train Operator if they passed signal N04-08 red. The Train Operator confirmed they passed the red signal. The Train Operator was supposed to wait until Train ID 607 cleared the single tracking area before proceeding. It appeared that Train ID 613 overran the red signal before Train ID 607 cleared the interlocking.

During the formal interview, the Train Operator stated that they were under the assumption that the Radio RTC gave them a permissive block to the next station. Instead of stopping ten feet from signal N04-08, the Train Operator stopped 32 feet after the red signal. This resulted in the Train Operator overrunning the signal N04-08 red.

At 14:14 hours, an RTRA Supervisor contacted the Buttons RTC and informed them they were onboard Train ID 613. The RTRA Supervisor moved the 52 customers that were onboard the train to the trailing car to assist with offloading the customers onto a rescue train. At 14:16 hours, the Radio RTC informed Train ID 614 they would serve as the rescue train.

At 14:24 hours, Train ID 614 performed close-in procedures and advised the Radio RTC that they were two feet away from Train ID 613 and keyed down. The RTRA Supervisor and Train Operator assisted the customers back to the platform at Spring Hill Station by walking them through the bulkhead doors of the rescue train.

The Emergency Response Team (ERT) conducted a track inspection and deemed the track safe for revenue service. The Office of Automatic Train Control (ATC) crew inspected the interlocking

and obstruction tests. The ATC crew reported no damage to any ATC equipment, and the interlocking was safe to be utilized.

No customers or WMATA personnel reported any injuries during this event.

### Chronological Event Timeline

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

Time	Description
04:34:20 hours	Radio RTC granted permission to TRST to perform concrete tie replacement between N1 780+00 to 897+00. [Ops. 4]
07:04:09 hours	<u>Radio RTC</u> : Announced single tracking utilizing track 2. [Ops. 4]
14:05:04 hours	<u>Train ID 613</u> : Contacted the Radio RTC to inform them they lost speed commands. <u>Radio RTC</u> : Granted Train ID 613 a permissive block to the 8-car marker at Spring Hill Station. [Ops. 4]
14:06:02 hours	<u>Radio RTC</u> : Instructed Train ID 613 to reopen their doors due to another train coming through the single tracking area. <u>Train ID 613</u> : Provided 100% repeat back. [Ops. 4]
14:09:07 hours	<u>Radio RTC</u> : Informed Train ID 613 they could close and continue and granted a permissive block no closer than 10 feet to signal N04-08 red while the train comes through the single tracking area. <u>Train ID 613</u> : Provided a repeat back. (audio was low). [Ops. 4]
14:12:05 hours	<u>Radio RTC</u> : Inquired if Train ID 613 passed signal N04-08. <u>Train ID 613</u> : Confirmed passing the signal. [Ops. 4]
14:14:05 hours	<u>RTRA Supervisor</u> : Contacted Button RTC to inform them they were on board Train ID 613. [Silver Line Phone]
14:14:30 hours	<u>Radio RTC</u> : Instructed the RTRA Supervisor to assist customers to the trailing car of Train ID 613 and Train ID 614 would be the rescue train to get the customers. <u>RTRA Supervisor</u> : Provided a 100% repeat back. [Ops. 4]
14:15:55 hours	<u>Button RTC</u> : Informed the ROIC Controller that Train ID 613 overran red signal N04-08. [Silver Line Phone]
14:16:21 hours	<u>Button RTC</u> : Informed Ashburn Terminal Supervisor of the red signal overrun. [Silver Line Phone]
14:16:46 hours	<u>Radio RTC</u> : Informed Train ID 614 that after servicing Greensboro Station, they would have a permissive block no closer than two feet of Train ID 613 and to proceed with safety stops. <u>Train ID 614</u> : Provided a 100% repeat back. [Ops. 4]
14:19:46 hours	<u>Button RTC</u> : Contacted MOC to request ATC and ERT to respond to Spring Hill Station for a red signal overrun. [Silver Line Phone]
14:23:07 hours	<u>RTRA Supervisor</u> : Informed the Button RTC that all customers were on the trailing car of Train ID 613. [Silver Line Phone]
14:24:49 hours	<u>Train ID 614</u> : Advised the Radio RTC they were keyed down and radio check on their hand held. [Ops. 4]
14:24:57 hours	<u>Radio RTC</u> : Inquired if any ADA customers were on board Train ID 613. <u>RTRA Supervisor</u> : Informed the Radio RTC there were none. [Ops. 4]
14:24:59 hours	<u>MAC Desk</u> : Notified the On-Call Safety Officer of the red signal overrun at Spring Hill Station. [MAC Line]

<b>Time</b>	<b>Description</b>
14:25:09 hours	<u>Radio RTC</u> : Inquired if Train ID 614 was two feet away. <u>Train ID 614</u> : Confirmed they were. <u>Radio RTC</u> : Instructed Train ID 614 to contact the RTRA Supervisor on Train ID 613. [Ops.4]
14:25:58 hours	<u>RTRA Supervisor</u> : Advised that there were 52 customers on board Train ID 613. [Ops. 4]
14:29:28 hours	<u>MICC AOM</u> : Provided Division Superintendent with an update on the situation. [Rail 2 Line]
14:29:28 hours	<u>RTRA Supervisor</u> : Advised the Radio RTC that all the customers were on the rescue train. <u>Radio RTC</u> : Provided a 100% repeat back. [Ops. 4]
14:29:46 hours	<u>Radio RTC</u> : Instructed Train ID 614 to reverse ends to their downtown end and key the customers off. <u>Train ID 614</u> : Provided a 100% repeat back. [Ops. 4]
14:33:45 hours	<u>RTRA Supervisor</u> : Advised the Radio RTC that all the customers were on the platform. <u>Radio RTC</u> : Gave a 100% repeat back. [Ops. 4]
14:41:43 hours	<u>MAC</u> : Provided the WMSC with an update of the red signal overrun. The WMSC provided an event scene release. [MAC Line]
14:44:38 hours	<u>ATC Personnel</u> : Contacted the Button RTC to advise they were on the scene at Spring Hill Station and requested permission to enter the roadway. <u>Buttons RTC</u> : Instructed the ATC Personnel to make their request over the radio. [Silver Line Phone]
14:48:26 hours	<u>Radio RTC</u> : Advised Train ID 614 they had an absolute block to Greensboro Station and was in service. <u>Train ID 614</u> : Provided a 100% repeat back. [Op. 4]
14:50:06 hours	<u>ATC Personnel</u> : Contacted the Radio RTC to request permission to enter the roadway to conduct an interlocking inspection, under ETO protection, and take control of the panel at Spring Hill Station. <u>Radio RTC</u> : Inquired who would have control of the panel. <u>ATC Personnel</u> : Provided the ATC call number of the personnel controlling the panel. <u>Radio RTC</u> : Provided a 100% repeat back. [Ops. 4]
14:57:58 hours	<u>ERT Unit</u> : Contacted the Radio RTC to request permission to enter the roadway under ATC's ETO protection to perform a track inspection. <u>Radio RTC</u> : Granted permission. [Ops. 4]
15:07:53 hours	<u>ERT Unit</u> : Inquired if the train could be moved to verify if there was any damage to switch 1B or the train, but it didn't appear to be any at the time. <u>Radio RTC</u> : Responded negative and to stand by. [Ops. 4]
15:12:14 hours	<u>SAFE Investigator</u> : Contacted the Radio RTC to request FT to enter the roadway to join ATC and ERT. <u>Radio RTC</u> : Granted FT to SAFE and RTRA Supervisor to enter the roadway. [Ops. 4]
15:16:29 hours	<u>RTRA Supervisor &amp; SAFE Investigator</u> : Relinquished the FT. [Ops. 4]
15:24:52 hours	<u>SAFE Investigator</u> : Informed the Radio RTC that all pictures had been taken, ERT, and ATC were clear, and they wanted to clear the signal to conduct an interlocking inspection. <u>Radio RTC</u> : Acknowledged the request. [Ops. 4]
15:27:35 hours	<u>Radio RTC</u> : Granted the RTRA Supervisor an absolute block to move the train back to the Spring Hill Station platform. [Ops. 4]

<b>Time</b>	<b>Description</b>
15:30:09 hours	<u>ERT Unit</u> : Advised the Radio RTC that there were no damaged track components, and the tracks were safe for revenue service. <u>Radio RTC</u> : Provided a 100% repeat back. [Ops.4]
15:39:32 hours	<u>ATC Personnel</u> : Advised all personnel were clear from the roadway and the interlocking was back in service. <u>Radio RTC</u> : Provided a 100% repeat back and advised Central was taking over the panel [Ops. 4]
15:40:22 hours	All personnel cleared from the roadway. Tracks safe for revenue service.
15:48:04 hours	Train ID 602 was the first train to service Spring Hill Station. [SPOTS Report]

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

### **Office of Automatic Train Control Maintenance**

*Adopted from ATC report with minor formatting and grammatical edits:*

“Around 14:26 hours on the day of the incident, MOC dispatched an ATC Technician to N04 for a train that overran a red signal. An ATC crew went roadside for an inspection. There was someone in the room recording the relay positions. After the train pulled out of the interlocking, the roadside crew inspected switch 1B. There was no damage to ATC equipment. The ATC crew then performed switch obstruction tests and placed the interlocking back in service.”

### **The Office of Chief Mechanical Officer (CMOR) / Vehicle Monitoring and Diagnostic System (VMDS)**

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

CMOR IIT completed the download and analysis of data and NVR video from Train ID 613, (L7608-7609x7537-7538x7510-7511x7505-7504T), which was reported for a Red Signal Overrun at Spring Hill N04-08 signal.

Based on vehicle monitoring and diagnostic system (VMDS) and event recorder (ER) data, Train ID 613's ATP Speed limit dropped to 0 MPH, and a full-service brake was applied 4 feet before reaching Spring Hill's 8<sup>th</sup> Car Marker. The stop and proceed mode was initiated, and the train moved to the 8<sup>th</sup> car marker, then stopped.

The doors were opened on the left side to service the station. The doors closed and master controller was placed in P1-P4 power mode and, the train began to move towards Wiehle-Reston without speed commands.

The train stopped 29 feet before the red signal N04-08 and moved by placing the master controller in P1-P4 power mode, the train passed the red signal N04-08 at a speed of 4 MPH and then came to a complete stop 32 feet after passing the Red Signal. Based on VMDS data, there were no faults with the train that contributed to the cause of this incident. The train performed as designed.

Time	Description of Events	Train Speed	Master Controller	ADU Regulated Speed	Limiting Speed	Chain Marker.
14:04:11	Train ID 613, with Lead Car 7608 entered Spring Hill platform limits, on Track# 2, at speed 16 Mph.	16 MPH	B1-B3	22 MPH	22 MPH	765+11
14:04:42	Train's ATP Limit speed drops from 22 Mph to 0 Mph. Train speed was 3 Mph. 10 feet before the 8 <sup>th</sup> car marker.	3 MPH	B1-B3	22 MPH	0 MPH	771+01
14:04:43	Train's ADU Regulated Speed Drops to 0 Mph, train speed 2.5 Mph, 5 feet before the 8 <sup>th</sup> car marker.	2.5 MPH	B4	0 MPH	0 MPH	771+06
14:04:45	Train came to a complete stop 4 feet before the 8 <sup>th</sup> car marker	0MPH	B4	0 MPH	0MPH	771+07
14:05:19	Stop and proceed was initiated.	0 MPH	B4	0 MPH	1 MPH	771+07
14:05:25	The Master Controller placed in the P1-P4 Power Mode and train moved 4 feet to the 8 <sup>th</sup> car marker.	0 MPH	P1-P4	0 MPH	1 MPH	771+11
14:05:29	Train came to a complete Stop at the 8 <sup>th</sup> car Marker.	0 mph	B5	0 mph	1 mph	771+11
14:06:17	Left side doors opened and station serviced.	0 MPH	B5	0 MPH	1 MPH	771+11
14:09:15	Left side doors closed and locked.	0 MPH	B4	0 MPH	1 MPH	771+11
14:09:32	The Master Controller placed P1-P4 Power Mode and train began to move.	0.36 MPH	P1-P4	0 MPH	1 MPH	771+12
14:10:31	Train came to a complete stop 29 feet before the Red Signal N08-02.	0 MPH	B5	0 MPH	1 MPH	778+73
14:10:36	The Master Controller placed at P1-P4; Train began to move.	0.12 MPH	P1-P4	0 MPH	1 MPH	778+73
14:10:46	Train passed RED signal N08-02 at speed 4 Mph; Master controller placed in P1-P4 power position.	4 MPH	P1-P2	0 MPH	1 MPH	779+02
14:10:51	Train came to a complete stop 32 feet after N08-02 Signal. Master controller placed at B5.	0 MPH	B5	0 MPH	1 MPH	779+34

R7608 ER Graph:

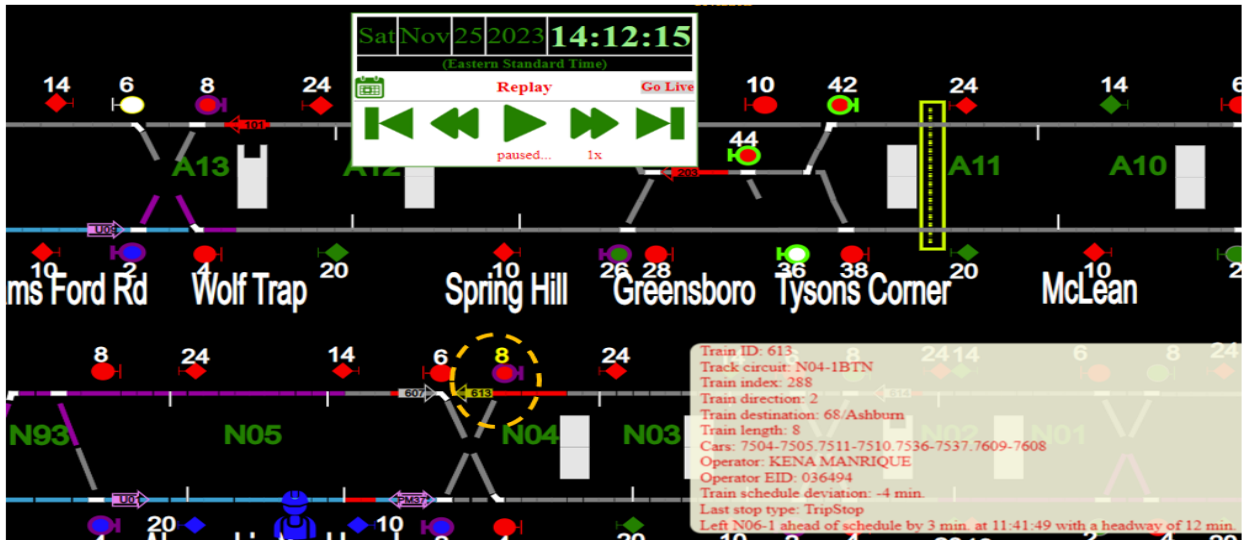
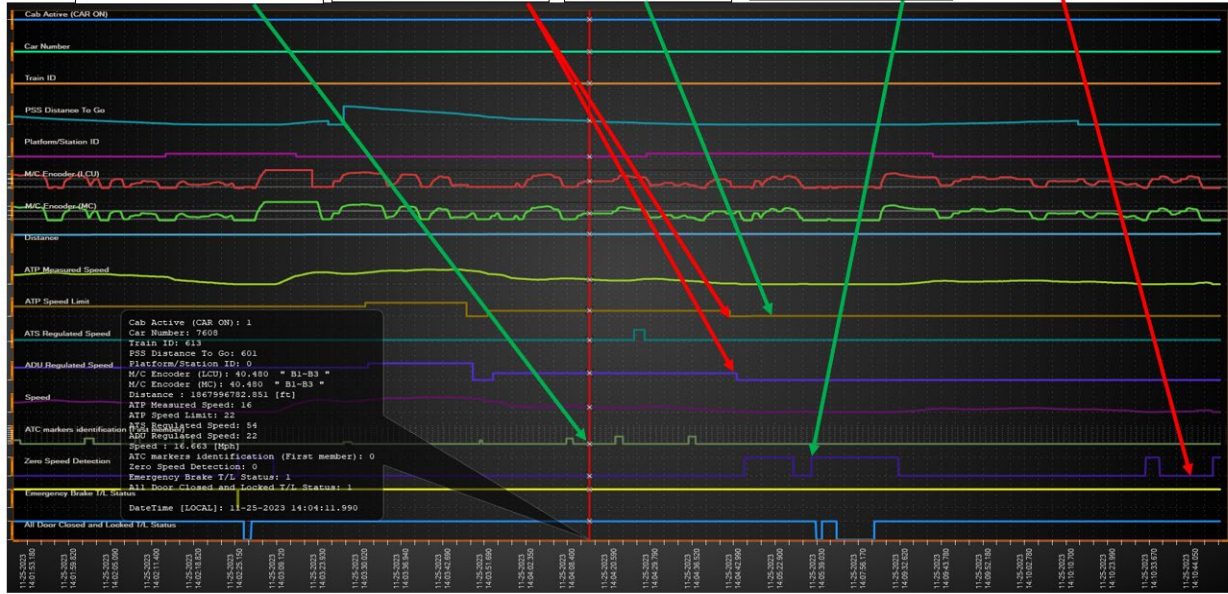
Train ID 613, with Lead Car 7608 entered Spring Hill platform limits.

Train lost speed commands 4 feet before reaching the 8<sup>th</sup> car marker.

Stop and proceed initiated

Train came to a complete stop at Spring Hill's 8<sup>th</sup> car marker.

The train passed RED N08-02 signal and 4 Mph



## Interview Findings

As part of the investigation launched into the event, SAFE interviewed one person. The interview identified the following key findings associated with this event. The findings detailed below include reported information from involved personnel and may conflict with other data sources contained in the report.

- The Train Operator was certified as a Train Operator in August 2023.
- The Train Operator previously worked at Glenmont Division but recently changed to Largo Division.
- The Train Operator has been at Largo Division for about four weeks.
- The Train Operator mainly operated on the Blue Line, and the day of the incident was their first time operating on the Silver Line.
- The Train Operator was completing their third-round trip during the red signal overrun.
- The Train Operator entered stop and proceed mode to berth at the 8-car marker of Spring Hill Station.
- When the Radio RTC gave the Train Operator a permissive block to signal N04-08, they thought the permissive block was to the next station.
- The Train Operator stated that the Radio RTC never corrected them when they gave a repeat back.

## Weather

On November 25, 2023, at the time of the incident, NOAA recorded the temperature as 42.8°F, with clear skies and 38.71% humidity. Spring Hill is an outdoor station. Weather was not a contributing factor in this incident. (Weather source: NOAA) – Location: Vienna, VA

## Related Rules and Procedures

### 3.3 Signals Requiring a Stop

Rail vehicles shall not be operated past or closer than a point 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 the Rail Traffic Controller or the Interlocking Operator and the move is consistent with customer safety.

### 9.8 Speed Commands

9.8.1 Rail Vehicle Operator shall not move trains with zero speed commands except after notifying the Rail Traffic Controller 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.

9.8.2 Upon losing speed commands on the platform, Rail Vehicle Operators shall not adjust the train in the same direction of traffic to service the station without contacting the Rail Traffic Controller or Terminal Supervisor for permission.

9.8.3 On 7000 Series Trains – If speed commands are lost on the mainline, and the consist to a complete stop with the Aspect Display Unit displaying the code number; the Operator must contact the Rail Traffic Controller or Terminal Supervisor to obtain either a permissive block or absolute block before entering the corresponding number on the Aspect Display Unit touchpad to enter Stop and Proceed Mode.



## 12.4 Radio Transmission & Reception Procedures

12.4.3 Personnel shall not take any action until they are positive that all radio transmissions or receptions are heard, fully understood, and acknowledged. Individual radio transmissions shall, always be repeated by the receiver so the transmitter can confirm the message was received completely and by the intended receiver.

## 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. The available data indicated no sign of fatigue. The video of the incident was reviewed for behaviors suggesting fatigue. No indications of fatigue were evident from the video. 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 evening shift in the days leading up to the incident. The Train Operator was awake for 7.7 hours at the time of the incident. The Train Operator reported 9.5 hours of sleep in the 24 hours preceding the incident. The off-duty period was 14.9 hours, providing an opportunity for 7-9 hours of sleep. This was a comparable amount of time as the Train Operator's usual workday sleep durations. The employee 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 single tracking operations between Spring Hill and Wiehle-Reston Stations trains were utilizing track 2.
- Train ID 613 did not have any mechanical issues.
- The Train Operator was instructed to hold on the platform at Spring Hill Station before departing.
- The Radio RTC gave the Train Operator a permissive block no closer than ten feet to signal N04-08.
- The Train Operator thought the permissive block was to the next station.
- The Train Operator provided a repeat back, but the audio was too low to determine if it was a 100% repeat back.
- The Radio RTC did not ask the Train Operator to repeat their radio transmission.
- The Train Operator entered stop and proceed mode four feet from the 8-car marker.
- Train ID 613 came to a complete stop 29 feet before signal N04-08 red.
- Train ID 613 passed N04-08 red signal at 4 MPH.
- Train ID 613 came to a complete stop 32 feet after passing signal N04-08.

## **Immediate Mitigation to Prevent Recurrence**

- In adherence to Standard Operating Procedure 102-1, which outlines the protocol for Removing an Employee from Service for involvement in an operational safety event, the Radio RTC dispatched a Rail Supervisor to relieve the Train Operator from duty for post-incident testing.
- In accordance with the Office of the Chief Mechanical Officer CMOR IIT Operations Administrative Policy (OAP) 102.06, the ROCC promptly removed Train ID 613 from revenue service for post-incident investigative measures. This action adhered to the Rail Vehicle Event Investigation Policy, ensuring a comprehensive incident examination.
- ERT and ATC were dispatched to perform a track and interlocking inspection.

## **Probable Cause Statement**

The probable cause of the Red Signal Overrun that occurred on November 25, 2023, at Spring Hill Station, track 2, was a lack of effective communication. The Train Operator misunderstood the Radio RTC instructions to proceed no closer than ten feet to signal N04-08.

## **Recommended Corrective Actions**

<b>Corrective Action Code</b>	<b>Description</b>	<b>Responsible Party</b>	<b>Estimated Completion Date</b>
113014_SAFE CAPS_MICC_0 01	MICC should review the need for 100% repeat backs during radio transmissions.	MICC SRC	Completed
113014_SAFE CAPS_RTRA_ 001	Train Operator needs to complete retraining with a focus on the importance of clear repeat backs.	RTRA SRC	Completed

## **Appendices**

### **Appendix A – Interview Summary**

*The below narratives summarize the incident and represent the statements made by the involved individual. 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 four years of service, including three months 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 March 2023. The Train Operator certified as a Train Operator in August 2023. The Train Operator was asked how alert they felt leading up to the incident, and they said they felt fully alert. The Train Operator did not mention any symptoms of fatigue.

The Train Operator mentioned they had an overall good experience during training, and had no concerns. The Train Operator said they worked with the same instructor and Train Operators during training for the most part. The Train Operator's biggest challenge during training was train recoveries. The Train Operator mentioned that there should be more time in the classroom and the field to ensure the students grasp the information. They mentioned having an even balance of training on the legacy and 7000 series trains. The Train Operator said they felt confident when they started revenue service alone.

The Train Operator started working at Largo Division about four weeks before the incident. The Train Operator was completing a run from Downtown Largo Station to Ashburn Station. The Train Operator was completing their last trip when the red signal overrun occurred.

Before the incident, the Train Operator had only operated to Courthouse Station, so this was their first day operating to Ashburn Station. The Train Operator mentioned it was a normal workday, and they did not experience any mechanical issues with the train while operating it. After servicing Spring Hill Station, the Train Operator was instructed to hold on the platform with their doors open due to single tracking operations.

The Train Operator thought the Radio RTC gave them a permissive block to the next station and not to signal N04-08. The Train Operator said that's why they passed the red signal because they believed they had a permissive block to the next station. The Train Operator said they gave a repeat back to Central, but they were never corrected, so they proceeded to the next station.

## Appendix B – Photographs



Figure 1: Shows N04-08 signal was red when Train ID 613 overran it.

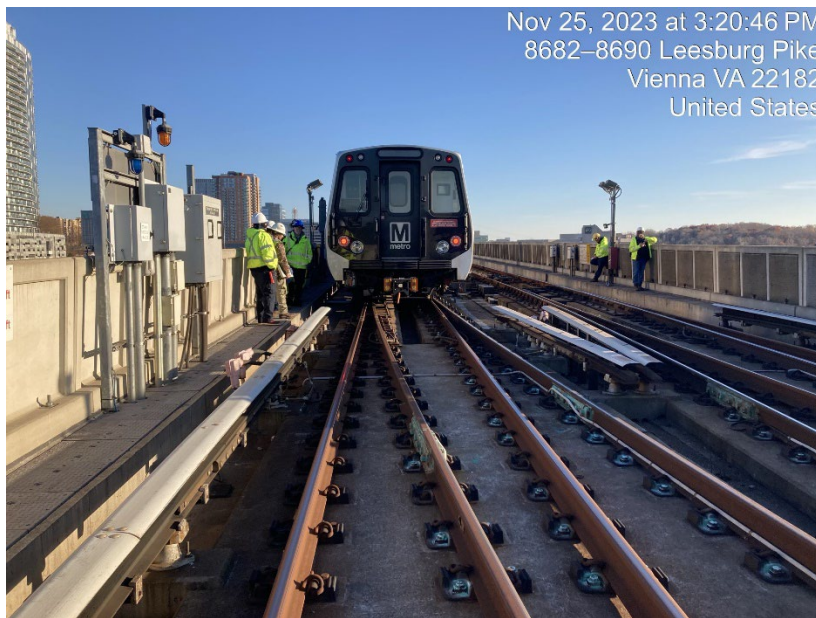


Figure 2: Shows Train ID 613 stopped prior to crossing the switch point.



Figure 3: Shows distance of travel Train ID 613 traversed past the red signal.

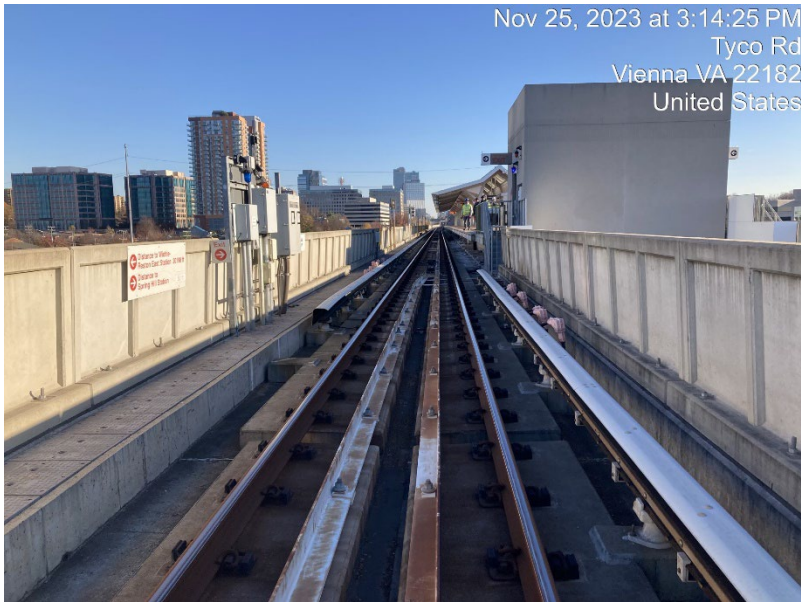


Figure 4: Shows how close Spring Hill Station was to the trailing car of Train ID 613.

Appendix C – ATCM Incident Timeline Report



ATCM INCIDENT TIME LINE REPORT

TO:  ATC

Date of Report: 11/25/23 Location: N04 MAXIMO WORK ORDER# 18256569

Problem reported: Train overrun Red signal

Date of Incident: 11/25/23 Duration of Incident (From-To): \_\_\_\_\_

Train Delay: \_\_\_\_\_ Time Crew Notified: 14:26 Time Crew Arrived: 14:40

Personnel (Name/Call #): [REDACTED]

Shift/Field Supv. (Name/Call#): [REDACTED] Time Notified: 14:26

Description of Problem Found: Train run red signal / switch 1B in normal position No Physical damage

CHRONOLOGY OF EVENTS (USE CONTINUATION IF MORE SPACE IS NEEDED) <small>List times in "Times" column with information on same line(s) as listed time(s).</small>	
Times	Events
<u>14:26</u>	<u>Was notified N04 Train overrun signal</u>
<u>14:28</u>	<u>Crew dispatched</u>
<u>14:45</u>	<u>Crew arrived @ n04</u>
<u>14:50</u>	<u>got Permission to enter road way</u>
<u>15:00</u>	<u>Get interlock inspect area</u>
<u>15:10</u>	<u>wait for Train to pull out to do more inspection</u>
<u>15:30</u>	<u>Train Palled out / obstruct SW/ ms</u>
<u>15:40</u>	<u>Clear road way return to service</u>

Corrective Action: NO Problem found.

Follow-Up/Remedial Action(s): \_\_\_\_\_

Supervisor Signature: [REDACTED] Date/Time: 18:06 11/25/23

Assistant Superintendent Signature: \_\_\_\_\_ Date/Time: \_\_\_\_\_

# Appendix D – ATCM Interlocking Inspection Tests

## Interlocking Inspection



ATC-1007B M3 Monthly Switch Inspection							Sheet 1 of 2
Work Order # <u>18256568</u>		Location Name: <u>N04</u>				Date: <u>11/25/23</u>	
Switch Number	1. Exterior Inspections			2. Interior Inspections			
	Layout Condition	Machine Condition	Track Department Involvement (y/n)	Motor Compartment	Circuit Controller Compartment	Gear Box Compartment	
<input checked="" type="checkbox"/> 1B	P	P	Y	P	P	P	

P=Pass/ Note repair or general condition

Switch Number	3. Mechanical Switch Obstruction											4. Point Detector Verification												
	Hand Far Point				Hand Near Point				Power Near Point		Power Far Point		Point Opening		Far Point				Near Point					
	3.5	3.7	3.8	3.9	3.15	3.17	3.18	3.19	3.23	3.24	3.26	3.27	3.29 Nor	3.29 Rev	4.2	4.7	4.8	4.9	4.13	4.15	4.20	4.21	4.22	4.24
<input checked="" type="checkbox"/> 1B	P	P	P	P	P	P	P	P	P	P	P	P	P	P	5	5	P	P	P	P	P	P	P	P

P=pass/F=Fail

Test Equipment (Model/Serial Number/Calibration Due): \_\_\_\_\_

Remarks:

Signatures: 11/25/23  
 Technician, Emp No   
 Supervisor Approval, Emp No & Date 11/25/23  
 & Date: \_\_\_\_\_



ATC-1007B M3 Monthly Switch Inspection

Work Order # 18256568 Location Name: N04 Date: 11/25/23

Switch Number	5. Switch Hand Crank Cut-out						
	5.2	5.3	5.4	5.5	5.7	5.9	5.10
X							
1B	P	P	P	P	P	P	P

6. Finish and Area Check	
6.1 Switch area clear	P
6.2 Switch secured	P
6.3 Layout area clear	P
6.4 Switch Operation	P

P=Pass/F=Fail

Test Equipment (Model/Serial Number/Calibration Due):

Remarks:

Signatures: [Redacted] 11/25/23

Technician, Emp No & Date: [Redacted] 11/25/22

Supervisor Approval, Emp No & Date: [Redacted]

Compliance Review & Date:





ATC-1000 1019 Interlocking Inspection		Location Name: <u>NOL</u>	Date: <u>11/25/23</u>	
Step	Inspections	(Y)	Observations	Remedial Actions
1.1	Interlocking HW not loose/missing pin bonds/althead bonds, and wiring intact/secure.	/		
1.2	I/S; cadweld bonds not defective, broken or frayed	/		
1.3	Gauge plate/switch rods insulators not defective	/		
1.4	Loops in good condition and properly mounted	/		
1.5	Impedence bonds and fastenings intact/secure	/		
1.6	MCM rail clamps, centre connectors secure	/		
1.7	Switch riser plates for adequate lubrication	/		
1.8	Block Box equipment complete	/		
1.9	Junction box checked	/		
1.10	AFO Markers in good condition and secure	/		
1.11	Drainage check	/		
2.1	Switch (terail) layout hardware checked	/		
2.2	Point rail closure, excessive wear or damage - derailing device marked with high visibility paint	/		
2.3	Derail Paint	X		
2.4	Jamb nuts on rods not loose	/		
2.5	Switch layout for excessive pumping or movement	/		
2.6	Cable conduit and fittings in good condition	/		
3.1	Jamb nuts and couplings under snow covers checked	/		
3.2	Switch machine mounting bolts secure	/		
3.3	Switch numbering, switch covers, snow covers	/		
3.4	Crank cover closed and secured. Padlocks in place on all covers.	/		
3.5	Snow cover all installed and secured in place	/		
4.1	Signal assembly hardware not missing - signal mast, foundation, mounting secure	/		
4.2	Signal lens clean and clear	/		
4.3	Signal name plate checked	/		
4.4	Signal aspects checked, not dark or dim	/		
4.5	Signal padlocks in place	/		
4.6	Signal paint and condition checked	/		
4.7	Wiring and Cables	/		

Signatures: \_\_\_\_\_  
 Technician, Emp No & Date: \_\_\_\_\_ 11/25/23  
 Supervisor Approval, Emp No & Date: \_\_\_\_\_ 11/25/23  
 Compliance Review & Date: \_\_\_\_\_

# Switch Detector and Route Locking Test



ATC-1000 1003		Switch Detector and Route Locking Test				Location Name: <i>NO4</i>			Work order #:			Date: <i>11/27/23</i>	
Detector Locking				Route Locking									
Switch		Track Circuit (1.1)	Switch Remains Locked (✓)(1.3)	Route		Track Circuits (Dropped in Sequence) (2.2,2.6,2.7)			Switches Remain Locked (✓) (2.4)	Conflicting Signals Prevented (✓) (2.5)			
Number (1.1)	Position (1.1)			Entrance Signal (2.1)	Exit Signal (2.1)								
1	N	1AT	✓	2	4	1AT	3AT				✓	✓	
		3AT	✓	4	2	3AT	1AT				✓	✓	
		1BT	✓	8	6	1BT	3BT				✓	✓	
		3BT	✓	6	8	3BT	1BT				✓	✓	
		1-3T	✓	2	8	1AT	1-3T	1BT				✓	✓
1	R	1AT	✓	8	2	1BT	1-3T	1AT			✓	✓	
		3AT	✓	4	6	3AT	1-3T	3BT			✓	✓	
		1BT	✓	6	4	3BT	1-3T	3AT			✓	✓	
		3BT	✓										
		1-3T	✓										

Test Equipment (Model/Serial Number/Calibration Due): *N/A* "over run signal 8"

Signatures:  
 Technician, Emp No & Date: [Redacted] *11/27/23*  
 Supervisor Approval, Emp No & Date: [Redacted] *11/27/2023*  
 Compliance Review & Date: \_\_\_\_\_



Detector Locking			Route Locking										
Switch		Track Circuit (1.1)	Switch Remains Locked (✓)(1.3)	Route		Track Circuits (Dropped in Sequence) (2.2,2.6,2.7)				Switches Remain Locked (✓) (2.4)	Conflicting Signals Prevented (✓) (2.5)		
Number (1.1)	Position (1.1)			Entrance Signal (2.1)	Exit Signal (2.1)								
3	N	1AT	✓	2	4	1AT	3AT				✓	✓	
		3AT	✓										
		1BT	✓	4	2	3AT	1AT				✓	✓	
		3BT	✓										
		1-3T	✓	8	6	1BT	3BT				✓	✓	
3	R	1AT	✓	6	8	3BT	1BT				✓	✓	
		3AT	✓										
		1BT	✓	2	8	1AT	1-3T	1BT				✓	✓
		3BT	✓										
				1-3T	✓	8	2	1BT	1-3T	1AT			✓
				4	6	3AT	1-3T	3BT			✓	✓	
				6	4	3BT	1-3T	3AT			✓	✓	

Test Equipment (Model/Serial Number/Calibration Due): N/A - "Over run signal 8"

Signatures:  
 Technician, Emp No & Date:   
 Supervisor Approval, Emp No & Date:   
 Compliance Review & Date: \_\_\_\_\_

# Interlocking Track Circuit Test



ATC-1000 1012B

**AF Track Circuit Test Data - TCR Copy**

Location Name: ND4

Track Circuit

Track	2 TRANSMITTER										3 RECEIVER			4 Track Circuit Shunt			5 Unintended Signal	6	Notes/Work Order #	Test Equipment/ Serial Number	Tech # & Initials	
	CAB Signal Level										Input Signal 3.1.1 3.2.1	Output Clipped 3.1.2 3.2.2	Output Signal 3.1.3 3.2.3	Mid PT Voltage	3 Pt	Adj Cr drop	Receiver output for unintended signal					Revisions
	F9 455kHz					F10 5025kHz																
	Transmit Output 2.1.1	Power Level 2.1.2	Track Detection F1-F8 2.1.3	Peak to Peak Voltage 2.2.1.3	Frequency Level 2.2.1.4	Power Level 2.2.1.8	Peak to Peak Voltage 2.2.1.6	Frequency Level 2.2.1.7	Power Level 2.2.1.8	Input Signal												
V p-p		Freq.	V p-p	Freq.	V p-p	Freq.	V p-p	Freq.	V p-p	(✓)	V p-p	(✓)	(✓)	V p-p	(✓)							
NI-781	69.5	25	2579	54.2	4554	25	507	5530	25	3.1	2.6	24.9	5.0	✓	✓	1.1	✓					
NI-787	84.0	25	3099	57.1	4554	25	47.4	5537	25	1.9	1.8	24.9	3.8	✓	✓	0.8	✓					
NI-793	135	30	3662	69.4	4556	30	64.7	5537	30	2.1	2.0	25.1	3.6	✓	✓	1.2	✓					
NI-801	98.6	25	2103	58.6	4554	25	53.9	5547	25	1.8	1.6	24.9	5.3	✓	✓	2.0	✓					
NI-806	35.1	25	2581	38.7	4562	30	30.3	5527	30	1.6	2.5	25.1	4.2	✓	✓	1.3	✓					
385	180	60	2823	95	4560	30	95	5545	30	2.2	1.2	24.8	7.6	✓	✓	1.2	✓					
185	181	60	3371	94	4550	30	96	5530	30	2.3	1.4	25.3	8.0	✓	✓	1.4	✓					
NI-777	45.2	15	3901	22	4550	10	16	5530	10	1.9	2.0	24.9	6.8	✓	✓		✓					

atures: oscscope F00037WC1, Due 13 Jan 24

Sheet # = 743676, T 22205, Mar 31, 24 By 2145 on 11/26/2023

Inspector Approval: [Redacted] 11/26/23

	Name	WZ #	Location
Transmitter			
Receiver			



<b>ATC-1000 1004A</b>								Date: 11.26.23	
<b>Approach &amp; Time Locking &amp; Signal Indication Locking Test</b>				Location Name: ND4				Work order #:	
Route(4)		Approach Locking				Time Locking			
		Switches Locked (5)		Conflicting Signals (5)		AS Timer (6)			Switches & Signals Remain Locked (7,8)
Entrance	Exit	Switches	(✓)	Routes	(✓)	Name	Design	Recorded	(✓)
8	6	1,3	✓	6-8,6-4,4-6	✓	8ASTE	52	52	✓
				2-8	✓				
8	2	1,3	✓	2-8,2-4,4-2	✓	8ASTE	52	52	✓
				6-8,6-4,4-6	✓				

Test Equipment (Model/Serial Number/Calibration Due): \_\_\_\_\_

Signatures:  
 Technician, Emp No & Date: \_\_\_\_\_ 11.26.23  
 Supervisor Approval, Emp No & Date: \_\_\_\_\_ 11-26-23  
 Compliance Review & Date: \_\_\_\_\_



ATC-1000 1004B

Approach Locking Circuit Test				Location Name: <u>N64</u>				Work order #:				Date: <u>11.26.23</u>			
For each Signal; drop each track circuit in the approach and verify the AR drops each time. Mark with (✓)															
Signal: <u>8</u>		Signal:		Signal:		Signal:		Signal:		Signal:		Signal:			
Track Circuit ↓	AR ↓	Track Circuit ↓	AR ↓	Track Circuit ↓	AR ↓	Track Circuit ↓	AR ↓	Track Circuit ↓	AR ↓	Track Circuit ↓	AR ↓	Track Circuit ↓	AR ↓		
<u>N2-777</u>	✓														
<u>N2-771</u>	✓														
<u>N2-765</u>	✓														
<u>N2-758</u>	✓														

Test Equipment (Model/Serial Number/Calibration Due): N/A

Signatures:  
 Technician, Emp No & Date: [REDACTED] 11.26.23  
 Supervisor Approval, Emp No & Date: [REDACTED] 11/26/23  
 Compliance Review & Date: \_\_\_\_\_

Appendix E – Train Operator Retraining



### RTRA Training Request Form

Use this Form for Reinstruction and Returned to Duty (RTD)

Please Print all Information

Employee Name ██████████		Employee Number ██████████	Division Largo M/T	Last Day Worked December 10, 2023
RTD Date* December 27, 2023,	Incident Date Nov. 25, 2023	Incident Type Red Signal Overrun		
Rule/Violation MOR 1.1.2, MOR 1.6.2, MOR 3.3, MOR 12.4.3			Post Incident? YES	Date Cleared Medical November 29, 2023

\*For employees returning from an inactive status, please assure that a PAR has been created and forwarded.

Brief Synopsis of Incident or Reason Out (Division Superintendent/Chief Operations Supervisor)	
On Saturday November 25, 2023, Rail Vehicle Operator ██████████ overran Red Signal N04-08 track #2 Spring Hill. Operator ██████████ also did not give the RTC a proper repeat back of the instructions given.	

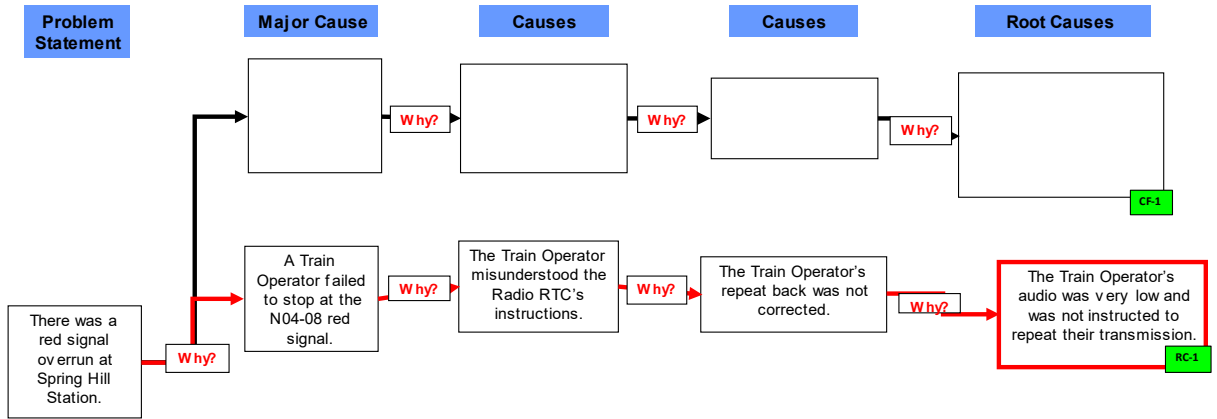
*Area Below for Rail Training Instructor Use Only*

Dates Reported 12-30-23	Dates of Training 12-30-23
<b>Instruction Provided</b>	
Operator ██████████ has reviewed and understands MOR 1.1.2, 1.6.2, 3.3 and 12.4.3	
Understands the importance of 100% repeat back for any and all instructions given from the interlocking operator or RTC and terminals.	
<b>How could incident have been prevented?</b>	
Operator ██████████ should have stopped her train within ten feet of the red signal at N04-08. She should have made sure to repeat back the instructions that she thought she heard to ensure the move was to be made in the safest way possible.	

Training Instructor ██████████	Signature & Date ██████████	12-30-23
--------------------------------	-----------------------------	----------

This form must be emailed to ██████████ immediately upon employee's notification to report to Rail Training. Please use additional sheet if more information is required.

## Appendix F – Why-Tree Analysis



## Root Cause Analysis