



## **WMSC Commissioner Brief: W-0071 – Train Rollback – New Carrollton Yard – October 16, 2020**

*Prepared for Washington Metrorail Safety Commission meeting on April 13, 2021*

### **Safety event summary:**

A married pair of railcars being repositioned on graded track in the New Carrollton Yard rolled back into another married pair around 6:47 a.m., causing damage to the electrical coupler pins.

The cars were being repositioned to create a four-car consist with an “A” car (normal operating cab) on the open end of the four-car consist after one of the married pairs was removed from the shop. To accomplish this efficiently, one train operator was in each married pair. The train operators requested, and the Interlocking Operator approved, use of the car wash for this repositioning. The car wash track is graded, and the operators uncoupled on a downgrade.

After uncoupling, the operator of cars 3172-3173 reported that that cars 3282-3283 had rolled back and recoupled to car 3282. This was reported several minutes after the rollback, and only after the train operator had attempted to uncouple the consists again. The investigation concluded that the cars rolled back when the train operator attempted to take a point of power on the graded track approximately 45 seconds after the cars had been uncoupled.

Metrorail personnel later uncoupled the railcars from the other end of the consist and moved the railcars prior to the arrival of investigators.

### **Probable Cause:**

The probable cause of this rollback was the lack of clear procedures, training and internal oversight of coupling and uncoupling practices, including as it relates to conducting these activities on graded tracks.

### **Corrective Actions:**

Metrorail provided refresher training on coupling and uncoupling procedures to the train operator of the vehicle that rolled back.

Metrorail is developing a lessons learned document based on this event and other rollbacks of vehicles.

Metrorail is developing a memorandum for train operators related to train separation when uncoupling cars.

### **WMSC staff observations:**

Providing a memorandum to train operators can be an important first step for safety, but Metrorail should consider whether incorporating these changes into training programs, rules and procedures could provide more long-lasting safety improvements related to rail vehicle movement, rollbacks and coupling, particularly given the prior, similar CMNT rollbacks that suggest a broader gap in training and procedures must be addressed.

Based on this and other events, Metrorail should also consider the need for improved yard familiarization, including as it relates to graded track.

Metrorail may also consider improving advance planning, tracking and communication to ensure that cars are properly and efficiently aligned for the safest and most efficient movement, which could reduce the need for moves like the one being attempted during this event.



750 First St. NE • Ste. 900 • Washington, D.C. 20002

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This event also demonstrates the importance of Metrorail training personnel on proper safety event protocols, as outlined in the WMSC's October 20, 2020 finding regarding investigation evidence and integrity.

**Staff recommendation:** Adopt final report.



# Washington Metro Area Transit Authority

## Department of Safety and Environmental Management (SAFE)

### FINAL REPORT OF INVESTIGATION A&I E20400

<b>Date of Event:</b>	10/16/2020
<b>Type of Event:</b>	Train Rollback of a Class 1 Vehicle
<b>Incident Time:</b>	06:34 hrs.
<b>Location:</b>	New Carrollton Yard, Track 21 North.
<b>Time and How received by SAFE:</b>	07:41 hrs. Safe On-call Phone.
<b>WMSC Notification Time:</b>	09:41 hrs.
<b>Responding Safety Officers:</b>	WMATA SAFE: Yes WMSC: No Other: N/A
<b>Rail Vehicle:</b>	3172-73 and 3282-83
<b>Injuries:</b>	None
<b>Damage:</b>	Electrical Coupler Pins on Rail Car 3282
<b>Emergency Responders:</b>	RTRA Supervisor and CMNT

# New Carrollton Yard – Train Rollback of a Class 1 Vehicle

October 16, 2020

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## Abbreviations and Acronyms

<b>AIMS</b>	Advanced Information Management System
<b>ARS</b>	Audio Recording Service
<b>ATC</b>	Automatic Train Control
<b>CCTV</b>	Closed-Circuit Television
<b>CENV</b>	Vehicle Program Services
<b>CID</b>	Crime Investigation Department
<b>CMNT</b>	Car Maintenance
<b>DCFD</b>	District of Columbia Fire Department
<b>DVEU</b>	Digital Video Evidence Unit
<b>ER</b>	Event Recorder
<b>FT</b>	Foul Time
<b>MOC</b>	Maintenance Operations Center
<b>MSRPH</b>	Metrorail Safety Rules Procedures Handbook
<b>MTPD</b>	Metro Transit Police Department
<b>NOAA</b>	National Oceanic Atmospheric Administration
<b>NVR</b>	Network Video Recording
<b>OCME</b>	Office of Chief Medical Examiner's Office
<b>OSC</b>	On-scene Commander
<b>PLNT</b>	Plant Maintenance
<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>SOP</b>	Standard Operating Procedure
<b>VMDS</b>	Vehicle Monitoring and Diagnostic System

### **Executive Summary**

On Friday, October 16, 2020, a New Carrollton division Interlocking Operator in the process of assigning several train moves within the yard, instructed Train Operator 1 to move rail car 3173 from Track 7 and make an add [couple] with rail car 3283 on Track 21 North at 06:22 hrs. Train Operator 1 acknowledged the request. At 06:39 hrs., Train Operator 2, completing a previous yard move, reported to the Interlocking Operator that they had secured a train on Track 19 North; the Interlocking Operator then instructed the Train Operator 2 to respond to Track 21 North to assist in double ending the train that would require four (4) rail cars to be removed from the shop. Train Operator 2 acknowledged the instruction. The Interlocking Operator stated, "they needed rail car 3173 coupled to rail car 3283 to allow an "A" car on the open end."

The Interlocking Operator stated to Train Operator 2, rail car 3282 would be coupled with the incoming deuce (married-pair) and the four (4) rail cars would have to be repositioned in the yard to allow rail cars 3172 and 3283 to be on the open end. At 06:43 hrs, the Train Operator 1 reported, rail car 3172 and 3182 were coupled with good brakes off. The Interlocking Operator granted the Train Operator 1 permission to move Northbound out of the shop with an absolute block to D99-70 signal lunar; the Interlocking Operator also instructed Train Operator 1 to leave two (2) rail cars behind D99-86 signal. At 06:45 hrs., the Train Operator 1 reported that they could reposition the four (4) rail cars behind D99-64 signal utilizing the car wash to clear D99-32 signal to ensure an "A" car would be on the open end of the 4-car consist. The two Train Operators successfully uncoupled rail cars 3172 and 3182. At 06:52 hrs., Train Operator 2 contacted the Interlocking Operator requesting Supervisor assistance.

At 06:53 hrs., Train Operator 2 contacted the Interlocking Operator on the telephone to report that rail car 3282 drifted back and recoupled to car 3172 with damage to the coupler pins on car 3282. The Interlocking Operator dispatched the Office of Car Maintenance (CMNT) to the scene. At 07:07 hrs., Train Operator 2 notified the Interlocking Operator that CMNT recommended that rail car 3282 be placed back in the shop. The Interlocking Operator contacted the Rail Operations Control Center (ROCC) and notified the Button Rail Traffic Controller (RTC) and division Superintendent. Train Operator 1 was subsequently removed from service and transported for post-incident testing. The incident train remained in the shop at New Carrollton Yard for post-incident inspection. Upon further inspection, CMNT noticed that the right front electrical coupler head had damaged pins.

The probable cause of this rollback was the lack of clear procedures, training and internal oversight of coupling and uncoupling practices, including as it relates to conducting these activities on graded tracks.



## **Purpose and Scope**

The purpose of this incident investigation and candid self-evaluation is to collect and analyze available facts, determine the probable cause(s) of the incident, identify contributing factors, and make recommendations to prevent a recurrence.

## **Investigation Process and Methods**

Upon receiving notification of the train rollback of a class 1 vehicle in New Carrollton Yard on October 16, 2020, SAFE dispatched a cross-functional team to assess the scene and conduct the subsequent investigation. SAFE team members worked with relevant WMATA subject matter experts to review facts and data associated with the incident.

## **Investigation Methods**

The investigative methodologies included the following:

- Physical Site Assessment
  
- Formal Interviews – 2 individual(s) will be interviewed as part of this investigation. Interviews will include persons present during and/or after the time of the incident and those directly involved in the response process. The following individuals will be interviewed:
  - Interlocking Operator
  - One (1) Train Operator
  
- Informal Interviews – Collected through conversations with individuals during the course of the investigation to provide background and supporting information
  
- Documentation Review – Collection of relevant work history information and process documentation contained in Metro systems of record. These records include:
  - Employee Training Procedures & Records
  - Certifications
  - 30-Day work history review
  - MSRPH
  - National Oceanic Atmospheric Administration (NOAA) data review



- System Data Recording Review – Collection of information contained in Metro Data Recording Systems. This data includes:
  - Audio Recording System (ARS) playback (Radio and Phone Communications)

## **Investigation**

On Friday, October 16, 2020, at approximately 06:22 hrs., the Interlocking Operator instructed Train Operator 1 to remove rail car 3272 and 3273 from Track 7 to Track 21 North with the intention to couple to rail cars 3282 and 3283. The Interlocking Operator instructed Train Operator 1 to make add depart the shop to ensure the “A” cars were on the open end of the consist. At 06:39 hrs., the Interlocking Operator instructed Train Operator 2, who recently secured a train on Track 19, to respond to Track 21 North to assist with the coupling of rail cars. The Interlocking Operator reiterated that the purpose of the coupling was to move the 4-car consist from the shop to ensure that rail cars 3272 and 3282 were on the open end of the consist. Once Train Operator 2 arrived at Track 21, they advised the Interlocking Operator that the rail car available to couple with was rail car 3282, due to car 3283 being on the south side of the shop.

The Interlocking Operator stated to both Train Operators, “once coupled, the four (4) rail cars would have to be repositioned in the yard to allow rail car 3172 and 3282 to be on the open end.” At 06:43 hrs., the Train Operator 1 reported, rail car 3172 and 3182 were coupled with a good brakes off. The Interlocking Operator then granted the Train Operator 1 permission to move Northbound out of the shop with an absolute block to D99-70 signal lunar and leave two (2) rail cars behind D99-86. At 06:45 hrs., Train Operator 1 reported that they could reposition the four (4) rail cars behind D99-64 signal utilizing the car wash to clear D99-32 signal to ensure an “A” car would be on the open end of the 4-car consist. The two Train Operators successfully uncoupled rail cars 3172 and 3182. At 06:52 hrs., the Train Operator 2 contacted the Interlocking Operator requesting Supervisor assistance.

At 06:53 hrs. the Train Operator 2 contacted the Interlocking Operator on the telephone to report that rail car 3282 drifted back and recoupled to car 3172, causing damage to the coupler pins on car 3282. The Interlocking Operator dispatched Car Maintenance (CMNT) to the scene. At 07:07 hrs., Train Operator 2 notified the Interlocking Operator that CMNT recommended that rail car 3282 will need to be placed back in the shop. The Interlocking Operator contacted ROCC and notified the Button RTC of the incident.

The Train Operator 1 was subsequently removed from service and transported for post-incident testing. The incident train remained in the New Carrollton rail yard, pending post-incident inspection. Upon further inspection, CMNT noticed that the right front electrical coupler had damaged pins.

SAFE investigations from the ARS include New Carrollton Yard OPS 2.

SAFE determined Train Operators were attempting to uncouple while on a downgrade portion of the Track. The Train Operators also did not provide enough separation between rail cars prior to the uncoupling. Additionally, Train Operator 1 delayed taking their "deuce" to a point of power after the initial uncoupling further contributed to the train rollback.

### **Chronological ARS Timeline**

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

06:22:50 hrs.	The Interlocking Operator contacted the Train Operator 1 and instructed them to remove a "deuce" from Track 7 and couple to another "deuce" located on Track 21 North with the intention of having the "A" cars on the open end of the 4- car consist. [Radio]
06:39:36 hrs.	The Interlocking Operator instructed Train Operator 2 to report to Track 21 to assist in the repositioning of the rail cars by double ending the 4-car consist. The Interlocking Operator instructed Train Operator 1 in car 3172 to couple to car 3182. [Radio]
06:43:07 hrs.	Train Operator 1 reported that rail car 3172 and 3182 were coupled with a good brakes off. [Radio]
06:45:32 hrs.	Train Operator 1 reported to the Interlocking Operator that they can perform a yard move utilizing the car wash to ensure the "A" cars on the open end of the 4-car consist. [Radio]
06:52:00 hrs.	Train Operator 2 contacted the Interlocking Operator and requested a supervisor. [Radio]
06:53:14 hrs.	Train Operator 1 contacted the Interlocking Operator on the telephone to report that rail car 3172 rolled back and recoupled to rail car 3182, causing damage to the coupler pins on rail car 3182. [Ambient]
07:07:28 hrs.	CMNT on the scene reported that rail car 3282 needed to be placed back in the shop. [Radio]

## **Vehicles Program Services**

### **Event Recorder (ER) Data Graph/Sequence of Events**

Based on CENV analysis of the downloaded Vehicle Monitoring and Diagnostic System (VMDS) and ER between cars 3172-3172 and cars 3282-3283. Details from the data analysis are as follows:

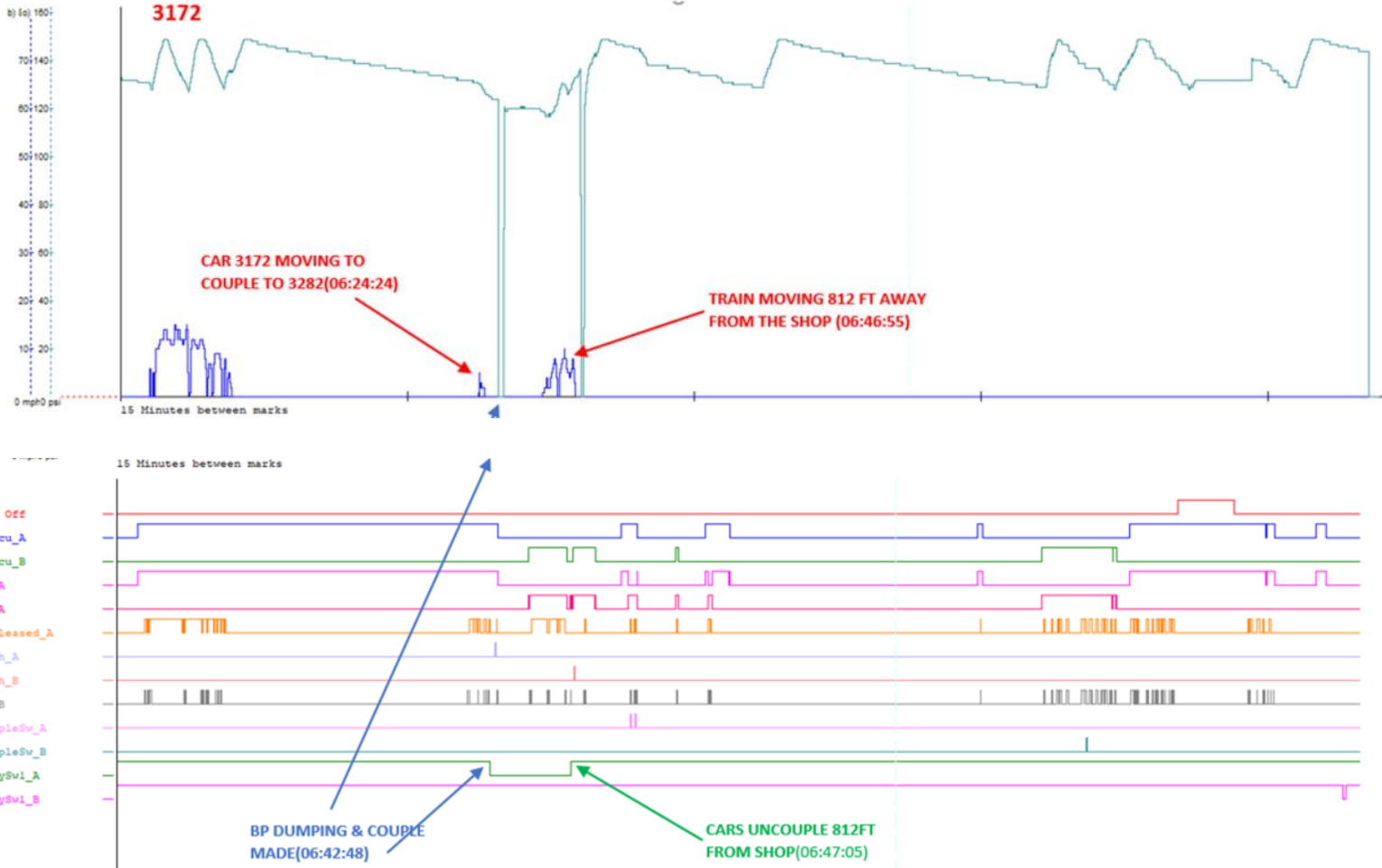
#### **Timeline of Events for Cars 7456 and 7457.**

06:24:24 hrs.	Car 3172 was moved towards the shop to couple to 3282.
06:28:51 hrs.	Car 3172 stopped in approach to the shop at 21 North lead.
06:42:48 hrs.	Car 3172 was coupled to car 3282.
06:44:50 hrs.	Car 3173 was keyed up.
06:45:15 hrs.	Train began to move away from the shop towards the North with 3173 as the lead.
06:46:55 hrs.	After moving 812 ft away from the shop, the train stops and keys down.
06:47:05 hrs.	Train Operator 2 activated the uncouple switch on Car 3282, and the cars uncoupled.
06:47:11 hrs.	Car 3172 is keyed up and brake pipe pressure recharged.
06:47:47 hrs.	Car 3172 was placed in P3 position and brakes released, but no motion was detected by the Vehicle Monitoring System (VMS).
06:47:54 hrs.	Rail car 3282 shows being recoupled, but 3172 does not; this is where car 3282 made contact with car 3172.
06:49:44 hrs.	Car 3172 was keyed up.
06:50:11 hrs.	Uncouple switch was activated several times from car 3172, but the car never shows uncoupled.
07:04:26 hrs.	After several attempts of keying down/up and unsuccessful attempts to recharge, the uncouple switch on car 3282 was activated and the trains were uncoupled.
07:05:18 hrs.	Car 3283 was keyed up and the brake pipe pressure was recharged.
07:05:32 hrs.	Car 3283 was keyed down.

07:12:20 hrs.

Car 3283 Keyed back up and moved away from Car 3172.

### Data Analysis for Cars 3272 and 3273.



## Data Analysis for Cars 3282 and 3283.

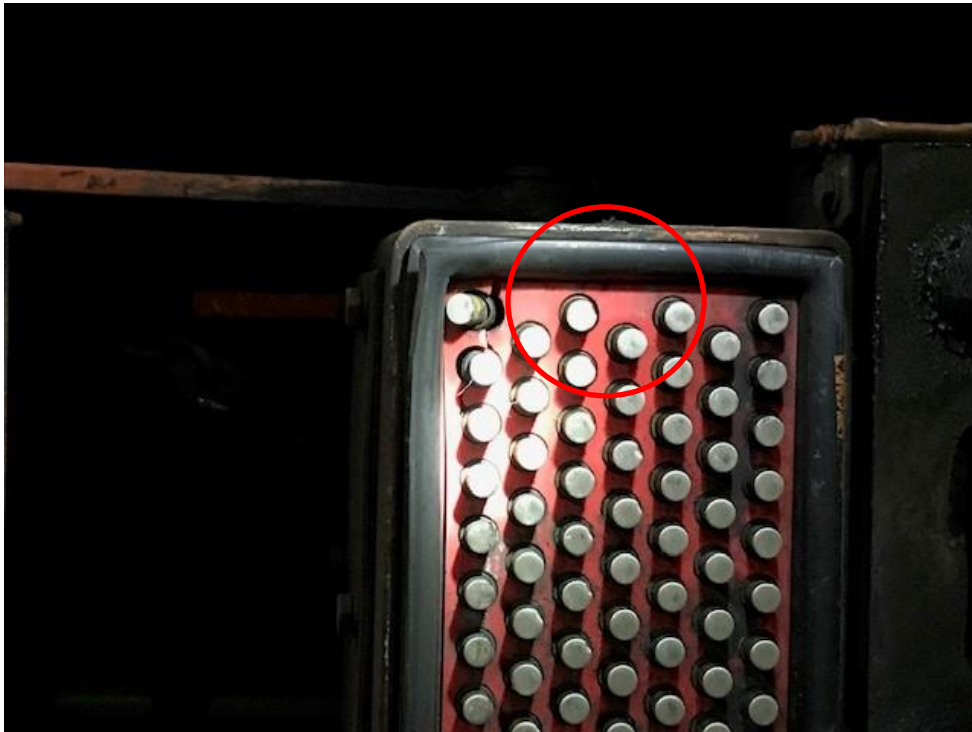
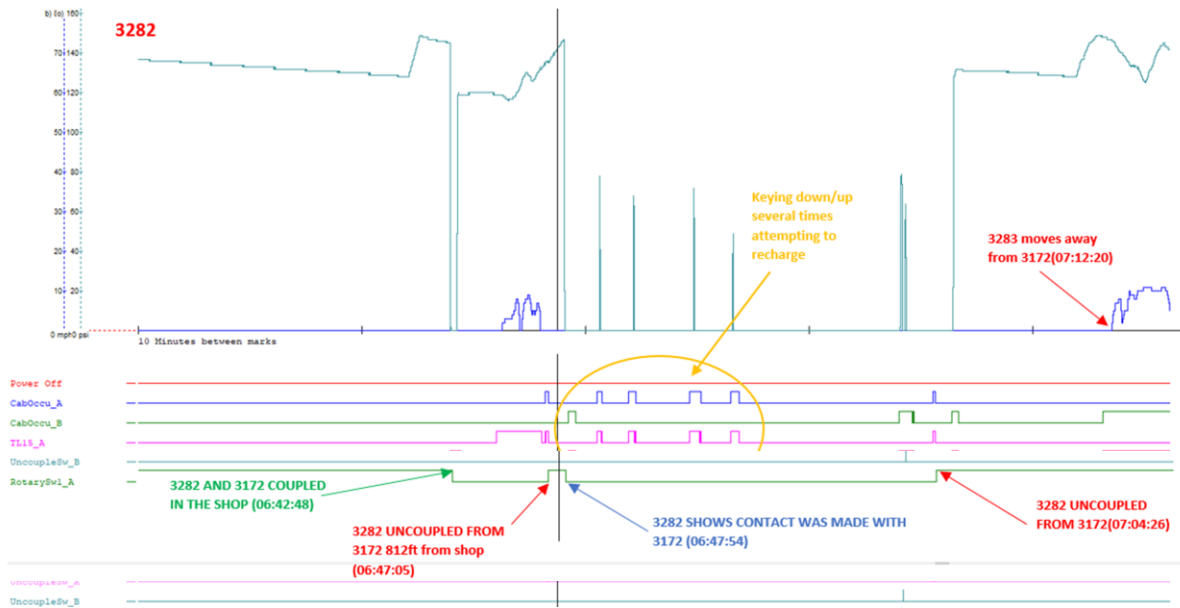


Photo 1: Damaged pins on the coupler head.

## **Findings**

- Train Operator 1 was performing a yard move that would enable the “A” car in a 4-car consist to be on the open end.
- The uncoupling process took place on a downgrade portion of the track.
- Train Operator 1 did not place the master controller in a B4/B5 rate for 15seconds in accordance with Metrorail Safety Rules and Procedures Handbook(MSRPH) Train Movement/Track Operation, section 16.5.3.1, “*In order to prevent unintentional coupling and/or damage to equipment when moving away from the stored unit, qualified personnel shall, place the master controller in B4/B5 for 15seconds and/or apply snow brakes before taking a point of power.* ”

## **Weather**

At the time of the incident, the temperature was 78° F and clear. SAFE has concluded that weather was not a contributing factor in this incident (Weather source: NOAA – Location: Landover, MD.)

## **Human Factors**

### Fatigue

Based on SAFE interview question related to Fatigue Factors and review of all the Train Operator’s 30-day work history, SAFE determined, employees’ hours of service were in accordance with WMATA’s *Fatigue Risk Management Policy 10.6* and *Hours of Service Limitations for Prevention of Fatigue Policy 10.7*.

### Post-Incident Toxicological Testing

After reviewing all employee post-incident testing results, SAFE determined that the Train Operator involved was not violation the Drug and Alcohol Policy and Testing Program 7.7.

## **Probable Cause**

The probable cause of this rollback was the lack of clear procedures, training and internal oversight of coupling and uncoupling practices, including as it relates to conducting these activities on graded tracks. Additionally, the Train Operator 1 delayed taking their "deuce" to a point of power after the initial uncoupling further contributed to the train rollback.

## **SAFE Recommendations**

As a result of this investigation, SAFE makes the following recommendations:

To RTRA, Train Operator 1 should undergo re-training with an emphasis on coupling and uncoupling class 1 vehicles rules and procedures.

To RTRA, provide a lessons learned to discuss the event and findings to include previous rollback event involving CMNT personnel.

To RTRA, issue a memorandum instructing Train Operators to provide adequate separation after uncoupling rail cars within a train consist.

## **Appendix A - Interview Summaries**

Interview Details

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

Interlocking Operator

The Interlocking Operator is a WMATA employee with eight years of experience as an Interlocking Operator and 12 years of service in various positions, Bus Operator and Train Operator.

The Interlocking Operator stated that they were in the process of dispatching revenue trains to the Terminal Supervisor. The Interlocking Operator said that a Train Operator successfully coupled Cars 3282 to 3172. The Interlocking Operator reported they instructed an additional Train Operator to double-end Car 3172 to make up an 8-car consist for revenue service. The Interlocking Operator stated to make the 8-car consist, they needed an "A" car on the open end and was notified by the additional Train Operator that the cars would need to be uncoupled to ensure the "A" car was on the open end. The Interlocking Operator confirmed the cars could be uncoupled utilizing the Car wash Track and instructed the Train Operators to proceed with the uncoupling process and notify the tower when the uncoupling and recoupling process was complete. The Interlocking Operator then stated that they were informed by one of the Train Operators on the radio requesting a Supervisor's assistance. The Interlocking Operator reported that they then received a phone call from the additional Train

Operator positioned in Car 3172 stating that during the uncoupling procedure, Car 3172 drifted back and into Car 3282 with damage. The Interlocking Operator dispatched CMNT to investigate the cars for any damage. The Interlocking Operator then stated that they notified the Terminal Supervisor that they would not be receiving their last revenue train then continued to inform their chain of command. That Interlocking Operator reported that CMNT reported minor damage to the communications pins on Car 3282. The Interlocking Operator then removed the Train Operator on Car 3172 from service; the Interlocking Operator said there were no radio communication issues.

#### Train Operator

The Train Operator is a WMATA employee with two years of experience as a Train Operator and eight years of service in various positions, Bus Operator.

Based on the SAFE interview, the Train Operator reported that they were contacted by the Interlocking Operator and instructed to assist a Train Operator on track 21 by double-ending a 4-car consist that was being removed from the shop. The Train Operator reported that they boarded the operating cab in Car 3172. The Train Operator reported that as the train exited the shop, the Interlocking Operator said they need the "A" car on the open end of the 4-car consist and instructed the Train Operators to uncouple the trains behind the D99-86 signal. The Train Operator stated that as they were performing the uncoupling procedure, they were located on the north side of the track in the direction of the yard. The other Train Operator was in the direction of the Carwash. The Train Operator stated that when they were notified that the cars were separated, the Train Operator assumed there was enough separation between the cars and attempted to take the train to the point of power. The Train Operator reported that when they went to the point of power, the train drifted back and contacted Car 3282. The Train Operator said that after they felt the train make contact, their train went into brakes in an emergency; the Train Operator keyed down and walked through the consist and observed minor damage to the communications pins' corner on Car 3283. The Train Operator contacted the Interlocking Operator to report the incident and await CMNT personnel to arrive on the scene. The Train Operator said that after the separation between the cars, they did not confirm that there was adequate space between trains; the Train Operator also stated that they did not utilize the snow during the uncoupling process brake after the trains were separated.