



WMSC Commissioner Brief: W-0036 – Derailment at Van Dorn St. Interlocking July 8,

2019 Prepared for Washington Metrorail Safety Commission meeting on August 4, 2020

Safety event summary:

A hi-rail vehicle derailed in the Van Dorn Street Interlocking (Blue Line) at approximately 9:15 p.m. on July 8, 2019. At the time, the area was shut down as part of a summer-long work zone.

As the vehicle was crossing from the Track 1 platform to the Track 2 platform at what was described as a “walking speed”, the rear truck derailed to the left side of the guarded switch. The point of derailment was about 20 feet from the left-hand switch point near the heel block. The guard rail appeared to be above the running rail by about an inch on the turnout side.

Four Metrorail ATC employees and three contractor spotters were standing or walking in the area of the vehicle when it derailed. There were no injuries reported.

Weather conditions were clear and were excluded as a contributing factor.

Probable Cause:

The Metrorail contractor reported that the airbag pressure on the hi-rail vehicle had been significantly increased beyond required levels. The airbags had been inflated to over 40 psi when they should be under 20 psi and should only be adjusted by qualified personnel. There was no requirement in place to check the airbag pressure prior to moving the hi-rail vehicle.

Corrective Actions:

As corrective actions, Metrorail said the contractor would correct the airbag pressure on this vehicle and include checking the airbag pressure on future pre-move checklists. The contractor also agreed to establish a protocol with Metrorail to handle future derailments.

WMSC staff observations:

Metrorail claimed that the contractor doing work in the shutdown area had “sole jurisdiction” over the event, however this is not the case. Metrorail is responsible for oversight of its contractors, and the WMSC is responsible for oversight of the entirety of the Metrorail system, including areas that are under construction.

In part due to this passing off of responsibility, the incident was only reported to the WMSC and Crisis Management Center between 3:43 a.m. and 03:52 a.m. the following day.

A more complete investigation was also hindered by the contractor re-railing the derailed vehicle at some point prior to Metrorail Safety Department arrival on scene approximately 2 hours after the derailment.

Staff recommendation: Adopt final report.

FINAL REPORT OF INVESTIGATION A&I E19354

SMS 20190709#81336

Date of Event:	07/08/2019
Type of Event:	Derailment
Incident Time:	21:15 hrs.
Location:	Van Dorn Interlocking – J Line, Chain Marker (CM) J1-687+20
Time and How received by SAFE:	Email 21:30 hrs.
Safety Officer Response:	Yes
Time of Safety Officer Arrival:	23:25 hrs.
Time of Safety Officer Departure:	03:00 hrs.
Rail Vehicle:	Hi-Rail Unit-VD1
Injuries:	None
Damage:	None
Emergency Responders:	SAFE, TRST, ATC, CTEM, POWER

Executive Summary

On Monday, July 8, 2019, at approximately 21:30 hrs., SAFE’s Construction Safety Manager received an email notification from a Contractor’s Management stating that at 21:15 hrs., Contractor’s High Rail Unit (HRU) VD1 derailed within the Van Dorn Street Interlocking, Chain Marker (CM) J1-687+20 while attempting a crossover move from the Track 1 platform to the Track 2 platform within the Authorized Construction Site (ACS). SAFE’s Construction Safety Manager notified SAFE personnel at 22:06 hrs., via email regarding the derailment incident.

Automatic Train Control (ATC) personnel responded and reported no damage to any ATC components. The incident vehicle was re-railed and remained within the ACS area for further inspection; however, no major damage was reported on the vehicle by contractor staff.

WMSC representative and the Crisis Management Center (CMC) were notified at 03:43 hrs., and 03:52 hrs., respectively.

No injuries were reported as a result of this incident.

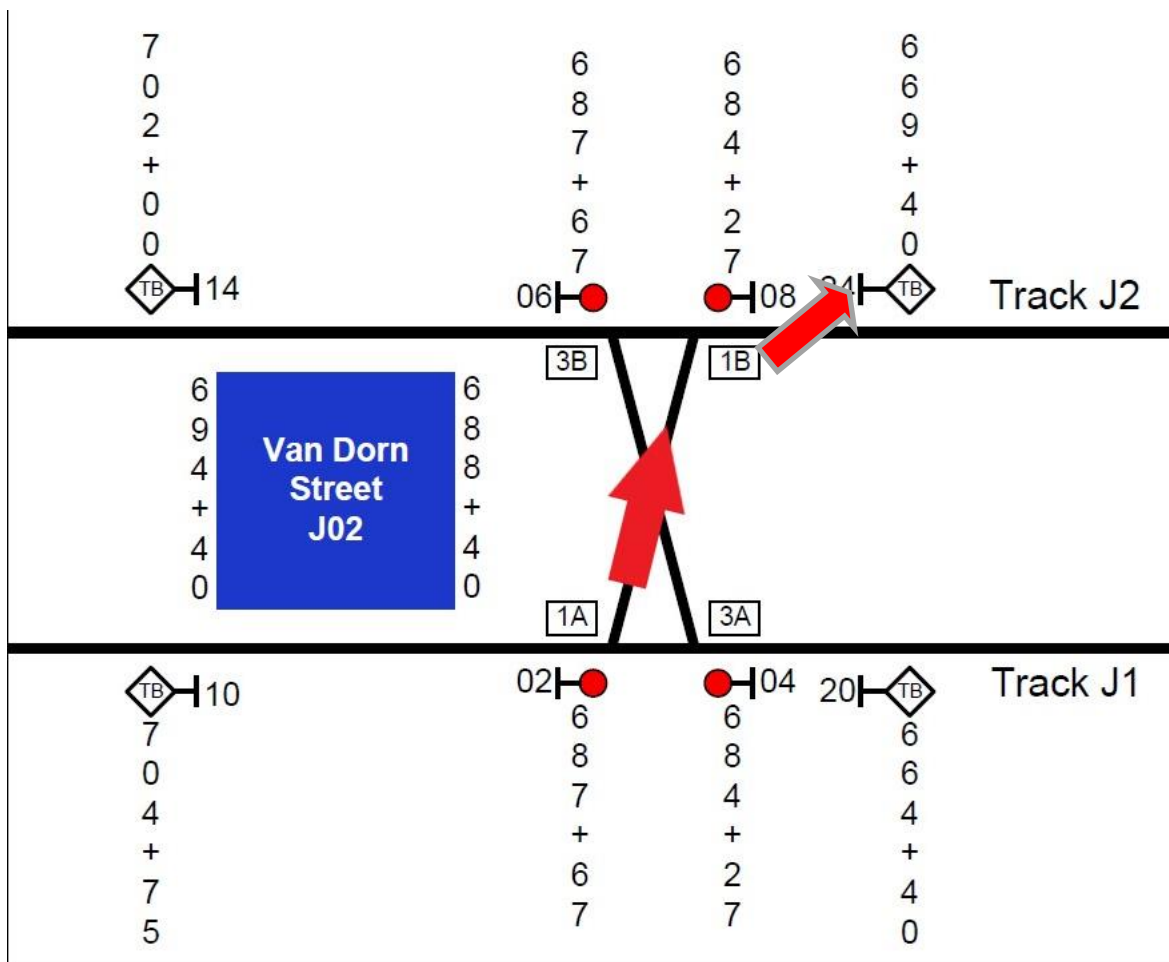
Notification

Title	Time	Comment:
Phone	03:43 hrs.	WMSC
Phone	03:43 hrs.	CMC
WMSC	03:57 hrs.	Email Notification

Incident Site

The incident area was located at Van Dorn interlocking at CM J1 687+20.

Field Sketch/Schematics



Investigation

Date: 7/08/2019 Time 21:30 hrs.

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Drafted By: SAFE 705 – 07/19/2019
Reviewed By: SAFE 701 – 08/28/2019
Approved By: SAFE 70 – 09/09/2019

On Monday, July 8, 2019, SAFE personnel arrived at Van Dorn at 23:25 hrs. A Washington Metropolitan Area Transit Authority (WMATA) inspector and Contractor's Manager informed SAFE that the Hi-Rail Unit (HRU) VD1 had been re-railed and stored at the 8-car marker of the Van Dorn Station, Track 2. The time of the re-railment prior to SAFE's arrival is unknown.

The HRU VD1 attempted a crossover move from the Track 1 platform to the Track 2 platform utilizing J02/1A, J02/1B and J02/3B switches when the unit's rear hi-rail truck derailed on the turnout side (left side) of the #8 guarded switch. The Point of Derailment (POD) determined to be at J1 687+20 about 20ft from the left-hand switch point near the heel block.

The Contractor Equipment Operator (CE/O) stated that he was moving the Hi-Rail vehicle without a WMATA pilot, at walking speed, with three (3) contractor spotters and four (4) WMATA ATC personnel on the ground when the derailment occurred. The CE/O also stated it was his 2nd time operating a Hi-Rail vehicle after getting certified in May 2019. The CE/O further stated, he has operated various heavy equipment since 1986.

SAFE responders reported that the turnout was in good condition, all track components were present and secured, ties were in overall good condition, straight stock rail had moderate head checking on gage side of the railhead. The guard rail appeared to be above the running rail by about an inch on the turnout side.

The Department of Transportation (DOT) inspection expires 4/2020, and WMATA inspection expires 9/2019. Based on preliminary findings, it is most probable that the rear road tires of the unit climbed on the guard rail and the Hi-rail gear wheels lost their normal relationship with the running rail and subsequently derailed.

Automatic Train Control (ATC)

ATC inspected the track component, and no damage was reported

Weather

At the time of the incident, the temperature was 70°F and clear. SAFE has concluded that weather was not a contributing factor in this incident (Weather source: National Oceanic Atmospheric Administration (NOAA) – Location: Alexandria, VA.)

HRU Information

- This HRU has been inspected and approved for Right of Way (ROW) use. Approval expires in September 2019. See Photo 5
- Wester Star Vehicle, Manufactured by Daimler Trucks North American LLC

Immediate Mitigation

- HRU unit was removed from service for post-incident inspection by contractor.
- ATC inspected the track component, and no damage was reported.

Conclusion

Based on the salient facts identified as part of this investigation, SAFE has reached the following conclusion on the causal factors in concurrence with contractor's incident report (see attachment 1):

1. Based on the contractor's post-incident inspection, an unidentified contractor personnel raised the pressure of the airbags to over 40 psi which should be under 20 psi. Only maintenance/qualified personnel should adjust the airbags.
2. The pre-move checklist did not require the CE/O to check the pressure of the HRU airbags.

Since this incident happened in an ACS area, the contractor had sole jurisdiction of event area and was responsible for investigating the accident and developing corrective actions. There was no data to support an improper operation by the CE/O of HRU that may have contributed to this incident. Considering all the facts gathered from this investigation, SAFE recommends closure of E19354.

Corrective Action

1. Contractor will implement the following measures to support the prevention of recurrence.
 - a. Include measuring the airbag pressure on the HRU pre-move checklist**
 - b. Contractor policy is to stop before crossing a switch/crossover and walk (not to exceed 3 mph) the vehicle to confirm that the Hi-rail gear does not climb/creep on the switch/crossover.**
 - c. Contractor Maintenance Personnel to correct the airbag pressure to the required 20 psi.**

Attachments

Date: 7/08/2019 Time 21:30 hrs.

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Drafted By: SAFE 705 – 07/19/2019
Reviewed By: SAFE 701 – 08/28/2019
Approved By: SAFE 70 – 09/09/2019

INCIDENT ALERT

INCIDENT TYPE: AUTO / EQUIPMENT
/ PROPERTY

Date and Time: 7/8/19 9:15 pm

District Name: Eastern District

Internal/External: Internal

Project Name: WMATA 6 Yellow/Blue Line

Description (What happened?)

At about 8:45pm an operation to switch the hi-rail trucks on track 1 and track 2 began with the assistance of WMATA ATC. Prior to moving any hi-rail vehicles the hi-rail move permits were filled out and a full inspection of the vehicles and surrounding tracks were executed. First, hi-rail was moved from track 2 over to track 1. Then, while moving the hi-rail from track 1 to track 2, the rear wheels of the hi-rail derailed while going over the switchover. The hi-rail was moving at approximately 2 mph and there were no signs warning a derailment. Once the vehicle came to a stop with the rear axle sitting on the rail, the operator was instructed to shut down truck and wait for further instruction. WMATA was notified immediately and all parties investigated the derailment. It was concluded that the air bag pressure was over-inflated making it, so the hi-rail was sitting higher than it should have been. When traversing over the switchover, which has a rail raised about an inch, the rear end of the hi-rail raised enough for the rear gears to disengage.

Causal Factors (Why did the incident happen?)

1. Following Procedures (Planning)

- Improper Use of Equipment

Details: Somebody raised the pressure of the airbags to over 40 psi (typically should be under 20 psi)

2. Following Procedures (Planning)

- No Pre- Inspection

Details: Pre-move checklist didn't require the operator to check the pressure of the hi-rails airbags

3. Tools, Equipment & Vehicles

- Not following Work Plan/ Procedure

Details: Nobody other than maintenance/qualified personnel should adjust the airbags

Corrective Measures (How can the incident be prevented in the future?)

- Implement the airbag pressure on the hi-rail vehicle move checklist
- Go as slow as possible while traversing crossovers
- Put together protocol with WMATA so all parties have coinciding procedures during a derail (WMATA request)

Reconstruction Photos:



2019

Attachment 1 – Contractor's Incident Report.

Photos

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Photo 1 – Left Rear of HRU Wheel Derailed



Photo 2 – HRU Serial Number



Photo 3 – HRU Certificate of Inspection. This Approval Expires September 2019