

**FINAL REPORT OF INVESTIGATION A&I E19226**

May 6, 2019  
C99 Yard Derailment

*Adopted by the Metrorail Safety Commission at its meeting on July 11, 2019.*

Washington Metrorail Safety Commission  
777 North Capitol Street, NE, Suite 402  
Washington, DC 20002



**FINAL REPORT OF INVESTIGATION A&I E19226****SMS 20190506#79719**

<b>Date of Event:</b>	05/06/2019
<b>Type of Event:</b>	Derailment
<b>Incident Time:</b>	13:45 hrs.
<b>Location:</b>	Alexandria Yard (C99)
<b>Time and How received by SAFE:</b>	13:50 hrs., On Call Phone
<b>Safety Officer Response:</b>	Yes
<b>Time of Safety Officer Arrival:</b>	13:50 hrs.
<b>Time of Safety Officer Departure:</b>	19:00 hrs.
<b>Rail Vehicle:</b>	Hi-Rail Unit
<b>Injuries:</b>	None
<b>Damage:</b>	None
<b>Emergency Responders:</b>	SAFE, TRST, ATC, CTEM, POWER

**Executive Summary**

On Monday, May 6, 2019 at approximately 13:50 hrs., Rail Operations Control Center (ROCC) received a report that at 13:45 hrs. a Kiewit Contractor Roadway Maintenance Machine (RMM), Hi-Rail Unit (HRU), derailed at Alexandria Yard (C99), affecting tracks 10 through 20. HRU derailed on one of the ladder tracks as it past C99-162 Signal. HRU came in contact with the third rail causing a partial power outage affecting the ladder tracks. HRU was going through certification acceptance testing to be allowed to work within the Washington Metropolitan Area Transit Authority (WMATA) system. The certification testing of the HRU included accessing the WMATA roadway from a crossroad and maneuvering through the yard. It is at this point that HRU came off the tracks shortly after accessing the WMATA roadway and passing C99-162 Signal. HRU was re-railed without further incident utilizing a Prime Mover (PM).

Automatic Train Control (ATC) personnel responded and reported no damage to any ATC components. The incident vehicle was removed from service for incident inspection. Car Track Equipment Maintenance's (CTEM) onsite incident inspection also revealed that no major damage occurred to HRU.

Based on review of the Audio Recording System (ARS) of the C99 derailment, the following information was revealed:

- At 13:43 hrs., The Tower notified Maintenance Operation Control (MOC) that HRU was making a move and a minor explosion occurred which tripped breaker 34 and power was lost in C99 Yard affecting tracks 10 through 20. The Tower requested to have Office of Power (POWER) respond to investigate.
- At 13:45 hrs., CE/O HRU, reported over the radio to the Tower that HRU had derailed at C99-162 Signal.

The WMATA pilot assigned to the vehicle and Contractor Equipment Operator (CE/O) was removed from service for post incident testing and subsequent interviewed by SAFE personnel. There are no reported injuries as a result of this incident.

### **Notification**

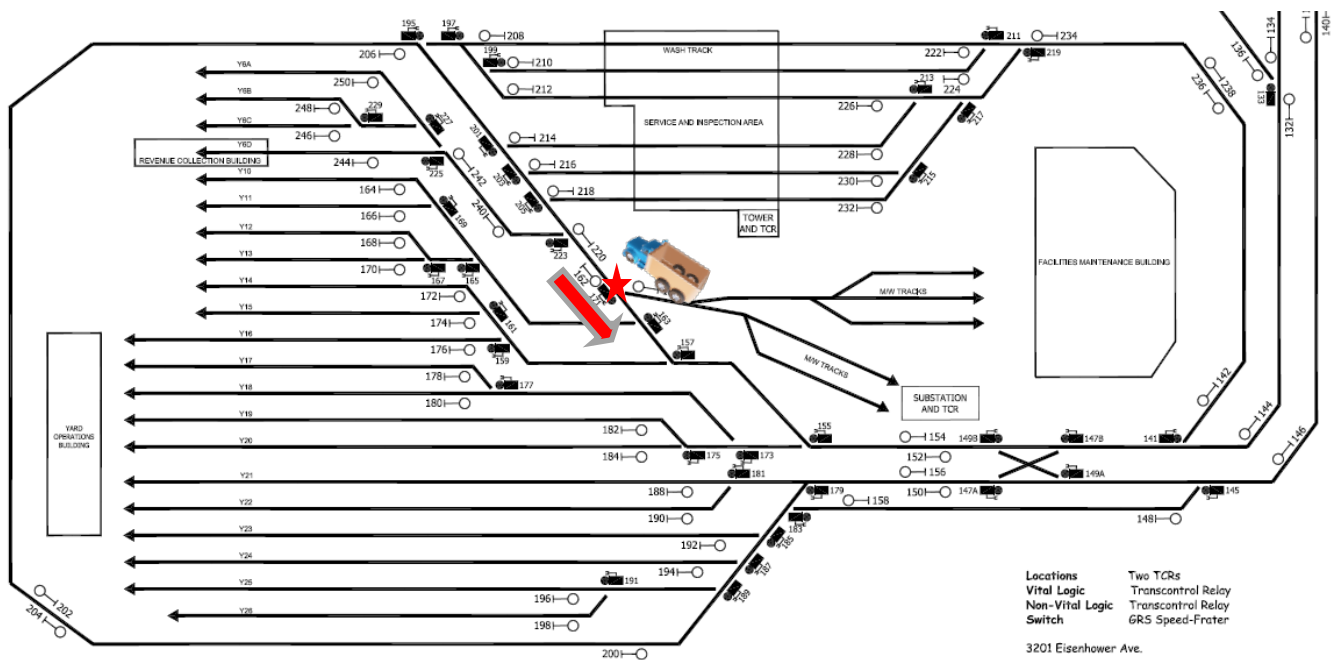
<b>Title</b>	<b>Time</b>	<b>Comment:</b>
<b>Phone</b>	14:10 hrs.	WMSC
<b>Phone</b>	14:10 hrs.	CMC
<b>FTA</b>	14:25 hrs.	Email Notification
<b>WMSC</b>	14:25 hrs.	Email Notification

### **Incident Site**

The incident area was located at C99-162. The area is described as a:

- Tangent to Curve Area
- Ballast track

### **Field Sketch/Schematics**



C99 SINGLE LINE TRACK PLAN



## Investigation

Date: 5/06/2019 Time 13:45 hrs.  
Final Report – Derailment C99 Yard  
E19226

Drafted By: SAFE 705 – 05/20/2019  
Reviewed By: SAFE 701 – 06/06/2019  
Approved By: SAFE 70 – 06/06/2019

On Monday, May 6, 2019, at approximately 13:45 hrs., C99 Tower received notification that a Kiewit contractor HRU derailed at C99-162 signal. The Kiewit contractor and WMATA personnel were in the process of performing a Hi-Rail vehicle inspection on a dual rear axle flatbed truck at C99 when the Hi-Rail vehicle de-railed. HRU being piloted by a WMATA TRST Equipment Operator traveled approximately 100 feet before derailling at C99-162 signal while operating in the reverse position.

During the process of traveling in reverse on the rail through the switches, the rear of the HRU de-railed and the rear-driver side rail wheel on the Hi-Rail equipment contacted the third rail causing them to arch flash. Track and Structures (TRST) personnel responded to the scene with a Prime Mover (PM) and was able to lift the rear of the vehicle and set it back on the running rails without further incident. The vehicle was driven to the crossing/stop sign near the west end of the shop, the high rail equipment was raised, and the vehicle was removed from the roadway onto the road at approximately 15:00 hrs. The derailment took down power from tracks 10 through 20. Power was restored to all tracks in the yard at approximately 15:30 hrs., with no damage reported. There were workers walking in front of the HRU when the incident occurred. The workers on the ground alerted the Kiewit Contractor Equipment Operator (CE/O) to stop the vehicle when they observed that HRU had climbed over the guard rail associated with the switch and subsequently derailed. The CE/O and the Pilot Operator (P/O) were sent for post incident testing.

#### TRST

Measurements were taken at the scene of the derailment. Per TRST the track measurements were in tolerance at the time HRU was on the track.

#### ATC

ATC inspected the track component and no damage was reported

## **Weather**

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

## **Findings**

- Last annual inspection was on July 10, 2018 the next scheduled inspection is set for July 9, 2019. See Photo 5
- Wester Star Vehicle, Model #WD110064, Manufactured by: Daimler Trucks North American LLC

## **Immediate Mitigation**

- CE/O and P/O removed from service for post-incident testing and interview
- HRU removed from service for post incident inspection
- TRST inspected the track and reported all track measurements were in tolerance
- 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:

1. Kiewit contractors removed the outer tires from both rear axles for testing the week prior to the incident. While yard testing and traversing the C99 loop, the truck was unable to maintain traction due to loss of tire contact with the running rail. Later that day Kiewit contractors installed a different set of tires to the rear of the unit in an attempt to correct the tire's loss of traction to the running rail issue. The unit was retested and during this time a derailment event occurred.
2. The original tires installed on the rear axle were (11R22.5) approximately 41.4-inch in diameter. The tires installed by Kiewit contractors on the rear axle (425/65R22.5) were approximately 44.2 inches in diameter. The changing of tires requires the high rail gear to be adjusted to maintain proper loading per the manufacturer Diversified Metal Fabricators (DMF) as stated in the manual for the 1630 rail gear. Due to these adjustments not being performed there was insufficient loading of the rear high rail allowing the wheel flange to climb the rail resulting in a derailment.

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 has no further information regarding E19226 and recommends its closure.

### **Proposed Corrective Action**

1. Before HRU can be returned to service on WMATA's property, CTEM recommends the following to support prevention of repeated recurrence.
  - a. **The front and rear high rail wheel bearings must all be replaced.**
  - b. **The high rail gear must be inspected for damage, adjusted to accommodate the new tire diameter and certified by a DMF factory authorized technician.**



## Photos



Photo 1 – C99-162 Signal





Photo 2 – Left Rear of HRU Wheel Derailed



Photo 3 – Left Rear of HRU Made Contact with the Third Rail



Photo 4 – Left Rear of HRU Made Contact with the Third Rail



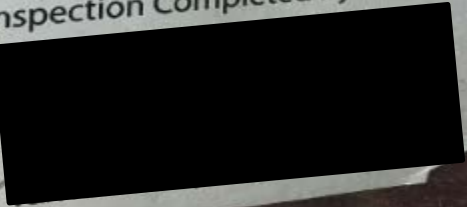
  
**Certificate of Annual Inspection**  
Date 7/10/18 Crane ☒  
High Rail ☒  
Make DMF / Carmach  
Model 1630  
Serial # 42058 / 42059  
Model 28200 Eb  
Serial # 553805  
Inspected By   
Next Inspection Date 7/9/19  
Inspection Completed by:  
  
☐  
☐  
☐  
☐  
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Photo 5 – HRU Certificate of Annual Inspection