



**WMSC Commissioner Brief: W-0190 Derailment – New Carrollton Station – August 29, 2022**

*Prepared for Washington Metrorail Safety Commission meeting on December 13, 2022*

**Safety event summary:**

A flat car being pushed by a hi-rail vehicle derailed at New Carrollton Station during a long-term shutdown of this portion of the Orange Line for platform, structure, and other repairs.

Mobile Command (Construction Inspector) contacted the Hi-Rail Vehicle Operator, a WMATA Contractor, via cellphone from the offsite Project Command Center at Landover Station and instructed them to move their vehicle backwards toward New Carrollton Station to allow other units to cross over the interlocking. Temporary Order NO T-22-17; ACS Limits for D Line Shutdown requires these vehicle movements to be coordinated through a contractor supervisor, but this move was not.

At the time of the event the Hi-Rail Vehicle was pushing a flat car outbound toward New Carrollton Station. There was no flagperson present in the vehicle to verify switch alignment. While operating in reverse as instructed, the Hi-Rail Vehicle Operator operated over a switch that was clamped in the reverse position and misaligned, causing the third set of wheels on the flat car to lift and lose contact with the running rail, resulting in a derailment. The Vehicle Operator applied brakes and notified their supervisor of the derailment. The switch had been clamped in the reverse position by an Office of Automatic Train Control Maintenance (ATCM) Mechanic at the request of the Construction Inspector for an earlier move that did not occur.

After the flat car derailed, the Project Safety Manager notified the Senior Safety Specialist and the Mission Assurance Coordinator (MAC). Other notifications were made to the Rail Operations Control Center (ROCC), the Office of Car Maintenance (CMNT), the Office of Track and Structure (TRST), the Office of Automatic Train Control Maintenance (ATCM), the Office of Safety Oversight (OSO) and the Office of Safety Investigations (OSI).

Following a field investigation, the flat car was rerailed and removed from service for further inspection. Inspection of the switch, switch components and roadway infrastructure found no damage.

The Vehicle Operator, the ACTM Mechanic and the Construction Inspector were removed from service for post-event toxicology testing.

**Probable Cause:**

The probable cause of this event was Metrorail's inadequate oversight of its contractors and Metrorail's acceptance of noncompliance with written rules and procedures.

**Corrective Actions:**

Metrorail conducted a review of track movement policy with all Equipment Operators.

WMATA Construction Inspector received reinstruction on procedures and prevention relating to this event.



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**WMSA staff observations:**

Metrorail must ensure that its culture – whether that of WMATA employees, contractors, or a combination – ensures compliance with written rules, instructions and manuals. Metrorail must also ensure adequate oversight of contractors to ensure that any supplemental rules, instructions, and manuals adopted, and the associated training provides for the highest practicable level of safety.

Movement without a flagperson or another way to verify switch alignment demonstrates a lack of these safety practices. Radio traffic during this event showed a separate operator had concerns with personnel not clearing to a place of safety when they sounded their horn.

It is imperative that WMATA ensures all personnel are properly trained and adhere to established policies created to maintain a safe work environment.



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

**FINAL REPORT OF INVESTIGATION A&I E22558**

<b>Date of Event:</b>	August 29, 2022
<b>Type of Event:</b>	Derailment
<b>Incident Time:</b>	12:47 Hours
<b>Location:</b>	New Carrollton Station (ACS) – D2 591+00 (1B switch)
<b>Time and How received by SAFE:</b>	13:00 Hours – SAFE/OSO
<b>WMSC Notification Time:</b>	13:50 Hours
<b>Responding Safety Officers:</b>	WMATA: OSO, OSI WMSC: None Other: None
<b>Rail Vehicle:</b>	Hi-Rail Vehicle 03-135241 Flat Car 57-189164 (CR7719)
<b>Injuries:</b>	None
<b>Damage:</b>	None
<b>SMS I/A Incident Number:</b>	20220829#102508

# **New Carrollton Station (ACS) – Derailment**

**August 29, 2022**

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## **Abbreviations and Acronyms**

<b>ACS</b>	Authorized Construction Site
<b>ARS</b>	Audio Recording System
<b>ATCM</b>	Office of Automatic Train Control Maintenance
<b>CAP</b>	Corrective Action Plan
<b>CAPD</b>	Office of Capital Program Delivery
<b>CCTV</b>	Closed-Circuit Television
<b>CENV</b>	Office of Vehicle Program Services
<b>CM</b>	Chain Marker
<b>CMNT</b>	Office of Car Maintenance
<b>MAC</b>	Mission Assurance Coordinator
<b>MSRPH</b>	Metrorail Safety Rules and Procedures Handbook
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>OEP</b>	Office of Emergency Preparedness
<b>OSI</b>	Office of Safety Investigations
<b>OSO</b>	Office of Safety Oversight
<b>RMM</b>	Rail Maintenance Machine
<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 Structure
<b>WMATA</b>	Washington Metropolitan Area Transit Authority
<b>WMSC</b>	Washington Metrorail Safety Commission

## **Executive Summary**

On Monday, August 29, 2022, at approximately 13:15 hours, a Kiewit Employee and Project Safety Manager notified the Office of Safety Oversight (OSO) Senior Safety Specialist that a Hi-Rail vehicle derailed at New Carrollton Station, within the Authorized Construction Site (ACS), on track 2. The Hi-Rail Vehicle Operator was operating the vehicle in reverse, pushing a flat car, when two wheels from flat car CR7719 contacted a clamped, misaligned switch and lost contact with the running rail, subsequently derailing at Chain Marker (CM) D2 591+00. There were no injuries or damage as a result of this event.

As part of the ACS work plan, Office of Automatic Train Control Maintenance (ATCM) personnel were assigned to crank and clamp switches to facilitate vehicle moves on request. The ATCM Mechanic reported that at approximately 08:00 hours, they were instructed to clamp the 1B and 1A switches in Reverse position in order to facilitate a move from track 2 to track 1 for a Roadway Maintenance Machine (RMM) coming from the yard. The RMM unit did not arrive, however the ATCM Mechanic was not instructed to remove the clamps. At the time the switches were clamped, the involved Hi-Rail vehicle was on Track 2 beyond the 1B switch on the Landover Station end of the interlocking.

The Audio Recording System (ARS) playback revealed that at approximately 11:48 hours, a move was planned for track unit Prime Mover 47 (PM-47) to follow track units Ballast Regulator 01 (BR-01) and Prime Mover 41 (PM-41) from an undetermined location within the ACS to New Carrollton Yard. At approximately 12:11 hours, PM-47 was instructed by Mobile Command to stop at Landover Station and instructed BR-01 and PM-41 to continue, then hold at the elevated track between Landover Station and New Carrollton Station, track two, for ATCM personnel to clear the roadway. At approximately 12:31 hours, BR-01 notified Mobile Command that they were holding at signal D13-06.

At approximately 12:35 hours, PM-47 notified Mobile Command that they were clear to continue towards New Carrollton Yard. At approximately 12:36 hours, Mobile Command confirmed that the ATCM crew working on the elevated track between Landover Station and New Carrollton Station were clear of the roadway for PM-47 to continue. At approximately 12:44 hours, the operator aboard BR-01 reported that personnel were on the track and advised PM-47 to proceed at 5MPH.

At approximately 12:45 hours, BR-01 advised that they were holding at D13-06 and reported that the Hi-Rail vehicle and flat car were in the interlocking, blocking their path to cross over from track 2 (3B Switch) to track 1 (3A Switch). Mobile Command advised that the Hi-Rail vehicle would be moved. At approximately 12:47 hours, Mobile Command advised that the Hi-Rail vehicle would back up and the track units would cross over from track two to track one to enter New Carrollton Yard. The Construction Inspector, working as Mobile Command, contacted the Hi-Rail Vehicle Operator via cellular phone and instructed them to move the vehicle backwards, towards New Carrollton Station, to allow the track units to traverse the interlocking. During this move, the Hi-Rail Vehicle operated over the 1B Switch, clamped and laying in reverse. The first truck of the flat car struck and climbed over the misaligned switch, but remained on the running rail. The second axle of the second truck lifted and derailed to the field side.

At approximately 13:15 hours, the Project Safety Manager notified the Senior Safety Specialist of the derailment. At approximately 13:17 hours, the Project Safety Manager notified the Office of

Emergency Preparedness (OEP) Mission Assurance Coordinator (MAC) of the derailment. Notifications and response requests were made to the Rail Operations Central Control (ROCC), the Office of Rail Car Maintenance (CMNT), the Office of Track and Structures (TRST) the Office of Automatic Train Control Maintenance (ATCM), the Office of Safety Oversight (OSO) and the Office of Safety Investigations (OSI).

Following a field investigation, at approximately 15:51 hours, Kiewit, with assistance from CMNT, rerailed the flat car.

Closed-Circuit Television (CCTV) of this event was not available. The derailment occurred within the WMATA Phase 4 Platform Rehab Project ACS between New Carrollton Station and Minnesota Avenue Station, a shut-down area without third rail power. CCTV cameras were offline at the time of the event as well.

Kiewit removed the Vehicle Operator from service for post-incident toxicology testing.

The Office of Capital Program Delivery (CAPD) removed the Construction Inspector (Mobile Command) from service for post-incident toxicology testing.

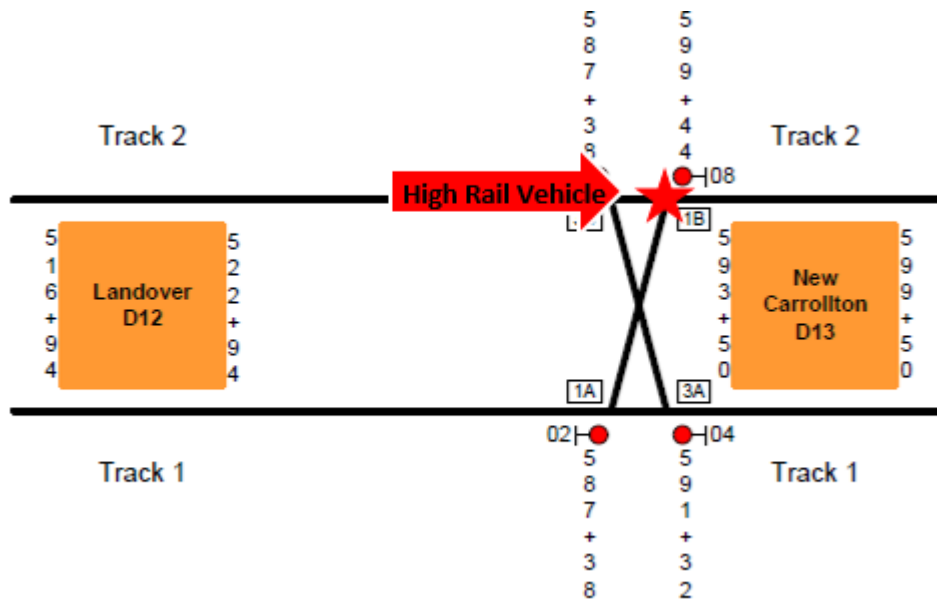
ATCM removed the ATCM Mechanic from service for post-incident toxicology testing.

The probable cause of the derailment event on August 29, 2022, was a failure to follow established procedures for vehicle movements within the ACS. The Construction Inspector and Hi-Rail Vehicle Operator both acknowledged that the movement was supposed to be coordinated through the Kiewit supervisor. A Contributing Factor to the event was that the Vehicle Operator moved the unit without a Flagman present, which was also required by procedure.

### **Incident Site**

New Carrollton Station, track 2  
CM D2 591+00 – Switch 1B

## Field Sketch/Schematics



*\*Locations are approximate. 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

Upon receiving notification of the Derailment event at New Carrollton Station, track 2, on August 29, 2022, SAFE dispatched a cross-functional team to assess the scene and conduct a subsequent investigation. SAFE team members worked with relevant WMATA subject matter experts to review the incident's facts and data.

The investigative methodologies included the following:

- Site Assessment through field investigation and document review.
- Formal Interviews – SAFE interviewed three individuals as part of this investigation. 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 personnel:
  - Vehicle Operator
  - Construction Inspector
  - ATCM Mechanic
- Informal Interviews – Collected through conversations with individuals during the investigation to provide background and supporting information. Note: Written statements were reviewed from personnel present during the event.
  - 3 – ATCM Mechanics
- Documentation Review – Collection of relevant work history information and process documentation contained in WMATA systems of record. These records include:



- 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
  - Post-incident test results
  - Written statements regarding the incident
  - Kiewit Investigation Report with Corrective Actions
  - Certification and Retraining Information
  - Copy of overall Safety Program for the project
  - Training records for involved employees
  - Daily Safety Briefings
  - Vehicle Inspection Logs
  - Job Safety Analysis
  - Incident/Accident Records
  - Applicable Policies and Procedures
  - Maximo Data
- System Data Recording Review – A collection of information contained in Metro Data Recording Systems. This data includes:
    - Audio Recording System (ARS) playback

### **Investigation**

On Monday, August 29, 2022, at approximately 13:15 hours, a Kiewit Employee and Project Safety Manager notified the OSO Senior Safety Specialist that a Hi-Rail Vehicle derailed at New Carrollton Station, track 2. The Hi-Rail Vehicle Operator was operating the vehicle in reverse, pushing a flat car, when two wheels from flat car CR7719 contacted a clamped, misaligned switch and lost contact with the running rail, subsequently derailing. There were no injuries or damage as a result of this event.



*Image 1 - Hi-Rail Vehicle 03-135241 and Flat Car 57-189164 (CR7719).*

The ARS playback revealed that at approximately 11:48 hours, planning for track unit PM-47 to follow track units BR-01 and PM-41 from an undetermined location within the ACS to the New Carrollton Yard began. At approximately 12:11 hours, PM-47 was instructed by Mobile Command to stop at Landover Station, who then instructed BR-01 and PM-41 to continue, then hold at the elevated track between Landover Station and New Carrollton Station, track two for the ATCM personnel to clear the roadway. ATCM personnel was replacing wayside equipment along the elevated track. At approximately 12:31 hours, BR-01 notified Mobile Command that they were holding at signal D13-06.

At approximately 12:35 hours, PM-47 notified Mobile Command that they were clear to continue towards New Carrollton Yard. At approximately 12:36 hours, Mobile Command confirmed that ATCM working on the elevated track between Landover Station and New Carrollton Station were clear of the roadway for PM-47 to continue. At approximately 12:44 hours, the operator aboard BR-01 reported that personnel were still on the track and advised PM-47 to proceed at 5MPH.

At approximately 12:45 hours, BR-01 advised that they were holding at D13-06 and reported to Mobile Command that a truck (Hi-Rail Vehicle 03-135241 and CR7719) was in the interlocking. Mobile Command advised that they would have the truck moved.

The Construction Inspector, working as Mobile Command, contacted the Hi-Rail Vehicle Operator, who was standing by in the vehicle waiting for a unit to depart New Carrollton Yard, via cellular phone and instructed them to move the vehicle backwards to allow the track units to traverse the interlocking. This action was not in accordance with Kiewit's track movement protocols, as the Construction Inspector did not have the authority to instruct the Hi-Rail Vehicle Operator to move the Hi-Rail Unit and the Hi-Rail Vehicle Operator did not verify that they were receiving instructions from an Authorized Kiewit Employee. At approximately 12:47 hours, Mobile Command advised that the truck would back up and the track units would crossover from track two to track one to enter New Carrollton Yard.

Upon receiving the phone call to move the vehicle, the Hi-Rail Vehicle Operator did not follow track movement protocol, which requires a High Rail Move Permit and Authorized Kiewit Employee to act as a spotter for the move. The Hi-Rail Vehicle Operator immediately moved, causing the Hi-Rail Vehicle to operate a trailing move over the 1B Switch, laying in reverse. The first truck of the flat car remained on the running rail, however the second axle of the second truck lifted and derailed to the field side.



*Image 2 - Kiewit Flat Car CR7719 derailed to the field side at switch 1B and Kiewit Flat Car R7719 derailed opposite the field side. Switch clamp is circled.*

At approximately 13:00 hours, Mobile Command advised the track units that ATCM personnel were responding to the interlocking to set a lead from track two to track one. The ATCM Mechanic was instructed to clamp switches 3B and 3A in Reverse position, to facilitate a move from track 2 to track 1 for the RMM units arriving from the Landover end of the work area. After clamping, the ATCM Mechanic left the site to perform other tasks. At approximately 13:13 hours, BR-01 and PM-41 were given permission to crossover from track two to track one and PM-47 to follow and hold after clearing the switches. After the move, there were no further requests for cranking and clamping switches and no further vehicle movement after the event was reported.

At approximately 13:15 hours, the Project Safety Manager notified the OSO Senior Safety Specialist of the derailment. At approximately 13:17 hours, the Project Safety Manager notified the MAC of the derailment. Notifications and response request were made to the ROCC, CMNT, TRST and ATCM, OSO and OSI. The WMSC authorized the Event Scene Release at approximately 13:24 hours.

At approximately 15:51 hours, Kiewit along with the assistance from CMNT rerailed the flat car. ATCM personnel inspected the derailment site after the unit was removed and found no damages to the switches or switch components. TRST personnel conducted an inspection of the roadway infrastructure and found it to be within tolerance.

CCTV of this event was not available. The derailment occurred within the WMATA Phase 4 Platform Rehab Project between New Carrollton Station and Minnesota Avenue Station, a shut-down area that does not have power.

Kiewit removed the Vehicle Operator from service for post-incident toxicology testing. The Vehicle Operator was suspended from service and a review of the Track Movement Policy was reviewed with all Equipment Operators. Additionally, incident data was evaluated for a fatigue analysis for the Vehicle Operator; however, due to the lack of work schedule information, specifically shift start and end times, the presence of fatigue risk factors contributing to the incident could not be thoroughly evaluated.

CAPD removed the Construction Inspector (Mobile Command) from service for post-incident toxicology testing. Incident data was evaluated for a fatigue analysis for the Construction Inspector and there were no major risk factors for fatigue identified.

ATCM removed the ATCM Mechanic that initially clamped switch 1B in reverse from service for post-incident toxicology testing. After review of the ATCM procedures while performing duties within the ACS, the ATCM Mechanic was found to have followed the established procedures since the ATCM Mechanic was not requested by an Authorized Kiewit Employee to remove the clamp from switch 1B for vehicle movement. Incident data was evaluated for a fatigue analysis for the ATCM Mechanic and there were no major risk factors for fatigue identified.

CMNT conducted a visual inspection after the unit was re-railed. No deficiencies were reported.

The Office of Vehicle Program Services (CENV) conducted a post-incident inspection of flat car CR7719 on August 31, 2022 at New Carrollton Rail Yard and concluded that there was no damage and no deficiencies were noted that would contribute to a derailment.

On Tuesday, September 5, 2022, six days after the derailment Kiewit personnel and equipment cleared the work location between New Carrollton Station and Minnesota Avenue Station. The WMATA Phase 4 Platform Rehab Project ACS was completed and revenue service was restored.

## Chronological Event Timeline

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

Time	Description
11:48:19 hours	Planning for PM-47 to follow Units BR-01 and PM-41 into New Carrollton Yard. [Radio]
12:11:29 hours	<u>Mobile Command</u> : PM-47 stop at Landover, track two. <u>PM-47</u> : Acknowledged. <u>Mobile Command</u> : BR-01 and PM-41, I'll let ATC know to clear track two at the bridge, stop at the bridge and confirm its clear. <u>BR-01 and PM-41</u> : Acknowledged. [Radio]
12:14:49 hours	<u>Mobile Command</u> : BR-01 you are going to hold until PM-47 catches up to you, then you will pass. <u>BR-01 and PM-41</u> : Acknowledged. [Radio]
12:17:14 hours	<u>PM-47</u> : Holding at Landover. [Radio]
12:31:02 hours	<u>BR-01</u> : Holding at D13-06. [Radio]
12:32:12 hours	<u>Mobile Command</u> : PM-47 let me know when you leave Landover, track two. <u>PM-47</u> : Acknowledged. <u>Mobile Command</u> : ATC is going back to work on the aerial. <u>PM-47</u> : Acknowledged. [Radio]
12:35:34 hours	<u>PM-47 Flagman</u> : PM-47 is ready to move. <u>Mobile Command</u> : Standby, ATC has to clear at D13 aerial. <u>PM-47</u> : Acknowledged. [Radio]
12:36:37 hours	<u>Mobile Command</u> : I've confirmed personnel are clear at D13 aerial. You have a lead to New Carrollton, track two. <u>PM-47</u> : I have permission to New Carrollton, track two. [Radio]
12:44:07 hours	<u>BR-01</u> : PM-47 hold, personnel on the track. Proceed at 5MPH. [Radio]
12:45:34 hours	<u>PM-47 Flagman</u> : This don't make no sense. <u>Mobile Command</u> : What do you need me to do? <u>BR-01</u> : Holding at D13-06, there's a truck in the interlocking. <u>Mobile Command</u> : Is ATC nearby to crossover to track one? I'll get the truck to move momentarily. [Radio]
12:47:05 hours	<u>BR-01</u> : There's a guy with a yellow hard hat walking in front of the unit. <u>PM-47 Flagman</u> : Sounds like ATC, blow the horn let them know you have instructions to move towards New Carrollton Yard. They're supposed to step to a place of safety. [Radio]
12:47:56 hours	<u>Mobile Command</u> : That Hi-Rail is going to back up so that you can crossover two to one. <u>BR-01</u> : Acknowledged. <u>Mobile Command</u> : I'm going to call to get track one clear. <u>BR-01</u> : Acknowledged. I noticed there are a lot of personnel that act like they can't hear the horns on the unit. They're supposed to step to a place of safety when the horn is blown. <u>PM-47 Flagman</u> : Proceed PM-47. <u>Mobile Command</u> : I'll talk to them about it. <u>BR-01</u> : Thank you. [Radio]
12:56:55 hours	<u>BR-01</u> : Do you know if ATC is coming back out to New Carrollton interlocking? [Radio]



Time	Description
13:00:37 hours	<u>BR-01</u> : Is ATC coming to New Carrollton Interlocking? <u>Mobile Command</u> : They're at the platform now, they're going to cross you over from two to one, I'm waiting for clear track on track one. I understand there is a high rail on track two. Once crossed over to track one, BR-01 and PM-41 will go into the yard. PM-47 will back up to pick up bags. <u>BR-01</u> : Acknowledged. <u>Mobile Command</u> : Standby. <u>BR-01</u> : Low on fuel. <u>Mobile Command</u> : Acknowledged. [Radio]
13:13:46 hours	<u>Mobile Command</u> : BR-01 and PM-41 you have permission to crossover from track two to track one into New Carrollton Yard. [Radio]
13:15:23 hours	<u>Mobile Command</u> : PM-47 you have permission to follow PM-41, crossover from track two to track one pass the switch on track one. Hold for switch to normalize. [Radio]
13:15 hours	Project Safety Manager for Kiewit reports the derailment to SAFE/OSO. [Phone]
13:17:22 hours	Project Safety Manager for Kiewit reports the derailment to SAFE/MAC advised that OSO Sr. Specialist was notified. [Phone]
13:20:33 hours	SAFE/MAC notified second OSO Sr. Specialist of the derailment. [Phone]
13:23:18 hours	SAFE/MAC notified WMSC of the derailment. [Phone]
13:25:25 hours	Project Safety Manager reported no damage and no injuries.to ROCC. [Phone]
14:03:34 hours	MAC confirmed SAFE personnel on scene. [Phone]
14:03 - 15:51:00 hours	On-scene investigation and evidence collection. Flatcar was then rerailed utilizing Kiewit equipment.

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

## Automatic Train Control Maintenance (ATCM)

*Report provided from ATC Safety & Compliance Officer*

"After arriving on the scene found the derailment at New Carrollton Station interlocking at switch 1B. The Supervisor on duty for ATC was working with his crew putting back equipment on the roadway tracks 1 & 2. The ATC Supervisor advised that they were requested to crank switch 1 in a reverse position for a crossover move which they did and then went back to performing other duties. There was no one left manning the interlocking to support cranking and clamping as needed for unit movements. The Kiewit Contractor Group sent High Rail Truck Unit 4731 with a Flatbed Unit CR7719 attached from Landover to New Carrollton on track 2 switch 3B was laying normal clamped and switch 1B was laying reversed clamped.

After evaluation of the area, the High Rail Unit from Kiewit operated past switch 3B without any issues conducting a facing move on track 2 since 3B was laying in the normal position for a straight through move coming from Landover to New Carrollton. When the unit got to switch 1B the Unit was now conducting a trailing move since switch 1B was laying in the reverse position. There was a request made earlier in the day for switch 1B to be clamped in the reverse position for a facing move coming from New Carrollton Yard to cross from track 2 to 1. The first and second set of wheels (trucks) on the flatbed was forced over the closed reverse point, staying on the running rails, the third set of wheels on the flatbed was attempting to be forced over the closed point; the flatbed unit wheel trucks were forced off the running rail causing the derailment.

There is no information detailing that there was a flagman on the unit in the rear to verify that the switches were in the correct alignment, or that the unit operator stop and check the switches for the correct alignment, notification of ATC to verify the switch positions were in the correct alignment before proceeding through the interlocking.

Preliminarily, there was no ATC equipment damaged, with the exception of the clamp that was used on the switch point. The derailed Unit was railed without any issues. Once the Unit was railed it was moved over the switch point and pushed further up the track so the switches and throw rods could be inspected. No damage was observed to the 0, 1 or 2 rods. The reverse point was pushed over slightly, and the reverse side was not fully tucked. The Unit was crossed over from track 2 to 1 and cleared the area. ATC crews then conducted and full PMI on all 4 Interlocking Switches and adjusted 1B.”

### **Office of Track and Structures (TRST)**

*Report provided from TRST,*

“TRST personnel conducted an inspection of the roadway infrastructure and found it to be within tolerance.”

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

*Report provided from CMNT,*

A visual inspection was conducted after the unit was re-railed. No deficiencies reported.

### **Office of Vehicle Program Services (CENV)**

*Report provided from CENV,*

“A post-incident inspection of cart CR7719 was conducted on August 31, 2022 in New Carrollton Yard. No damage was noted. No deficiencies were noted that would contribute to a derailment.”

### **Interview Findings**

As part of the investigation launched into the New Carrollton Station Derailment event, SAFE conducted three in-person interviews that were also held over Microsoft Teams, including the Investigations Team and the WMSC. The interviews were conducted on the day of the event and identified the following key findings associated with this event. Findings detailed below include reported information from interviews and may conflict with other data sources contained in the report.

#### *Vehicle Operator*

- WMATA personnel were transporting equipment via rail vehicles through the interlocking where the high rail vehicle was secured and needed to traverse the interlocking from track two to track one.
- They received a call on their assigned cellular phone, the caller asked that they move the vehicle backwards.
- They sounded the horn three times and began reversing towards New Carrollton Station.
- The front of their trailer came off the right side of the tracks.
- Contacted their Supervisor to notify them of the incident.

- They usually have assistance from another contractor or Supervisor when backing.
- They assumed the track was clear and that a Supervisor had called them to give the instructions.
- Kiewit personnel only receive instructions from the Kiewit Supervisor to avoid miscommunications between work tasks.

#### *Construction Inspector*

- They requested assistance from the ATC personnel to clamp switch 1B to provide the route for the prime mover from track two to track one.
- The plans for the prime mover changed, the prime mover did not come out of the yard.
- They received plans to move rail vehicles from Cheverly Station to New Carrollton Station.
- The vehicles traveled on track two, then were routed to track one once at New Carrollton.
- They received information that the high rail vehicle was in the path of the approaching rail vehicles.
- They called the high rail vehicle operator and instructed them to move backwards to allow the rail vehicles to traverse the interlocking.
- They received a call from SAFE stating the high rail vehicle had derailed.

#### *ATCM Mechanic*

- The Construction Inspector called on the phone and asked them to crank switches 1B and 1A in reverse for PM-43 to leave New Carrollton Yard.
- They went to New Carrollton Tower to report the move for PM-43 and verified the switches with the Interlocking Operator.
- PM-43 never left New Carrollton Yard.
- They returned to the platform and the incident had already occurred, they did not attempt to assist.

#### **Weather**

At the time of the incident, NOAA recorded the temperature at 89 ° F, with scattered clouds. Based on findings, Weather was not a contributing factor in this incident (Weather source: NOAA – Location: New Carrollton, MD)

#### **Related Rules and Procedures**

#### **Human Factors**

##### Fatigue

##### *Evidence of Fatigue*

##### *Vehicle Operator*

Conditions at the time of the incident were evaluated to distinguish whether evidence of fatigue was present. Video of the incident was not available to ascertain whether evidence of fatigue was present. The Operator reported feeling Fully Alert at the time of the incident. The Employee reported experiencing no symptoms of fatigue in the time leading up to the incident.

#### *Construction Inspector*

Conditions at the time of the incident were evaluated to distinguish whether evidence of fatigue was present. Video of the incident was not available to ascertain whether evidence of fatigue was present. The Construction Inspector reported feeling Fully Alert at the time of the incident. The Employee reported experiencing no symptoms of fatigue in the time leading up to the incident.

#### *ATCM Mechanic*

Conditions at the time of the incident were evaluated to distinguish whether evidence of fatigue was present. Video of the incident was not available to ascertain whether evidence of fatigue was present. The ATCM Mechanic reported feeling Fully Alert at the time of the incident. The Employee reported experiencing no symptoms of fatigue in the time leading up to the incident.

#### *Fatigue Risk*

##### *Vehicle Operator*

Incident data was evaluated for fatigue risk factors. The incident time of day (12:47 hours) does not suggest an increased risk of fatigue-related impairment. Work schedule information for the Vehicle Operator did not include shift start and end times; however, during the interview, the Vehicle Operator indicated that they worked day shifts for 11 consecutive days leading up to the incident. The employee reported a total of 8.5 hours of sleep in the last sleep period preceding the incident and was awake for 9.3 hours at the time of the incident. The off-duty period preceding the incident was 13.8 hours long, which provided the opportunity for 7-9 hours of sleep. The employee reported usual workday sleep durations of 8.5 hours and no issues with sleep.

Due to the lack of work schedule information, specifically shift start and end times, the presence of fatigue risk factors contributing to the incident could not be thoroughly evaluated with a modeling analysis.

##### *Construction Inspector*

Incident data was evaluated for fatigue risk factors. There were no major risk factors for fatigue identified. The incident time of day (12:47 hours) does not suggest an increased risk of fatigue-related impairment. The employee worked day shifts (4:30 – 19:00) in the days leading up to the incident. The employee reported a total of 7 hours and 15 minutes of sleep in the last sleep period preceding the incident and was awake for 9 hours at the time of the incident. The off-duty period preceding the incident was 9.5 hours long, which provided the opportunity for 7-9 hours of sleep. The employee reported usual workday sleep durations of 7 hours and no issues with sleep.

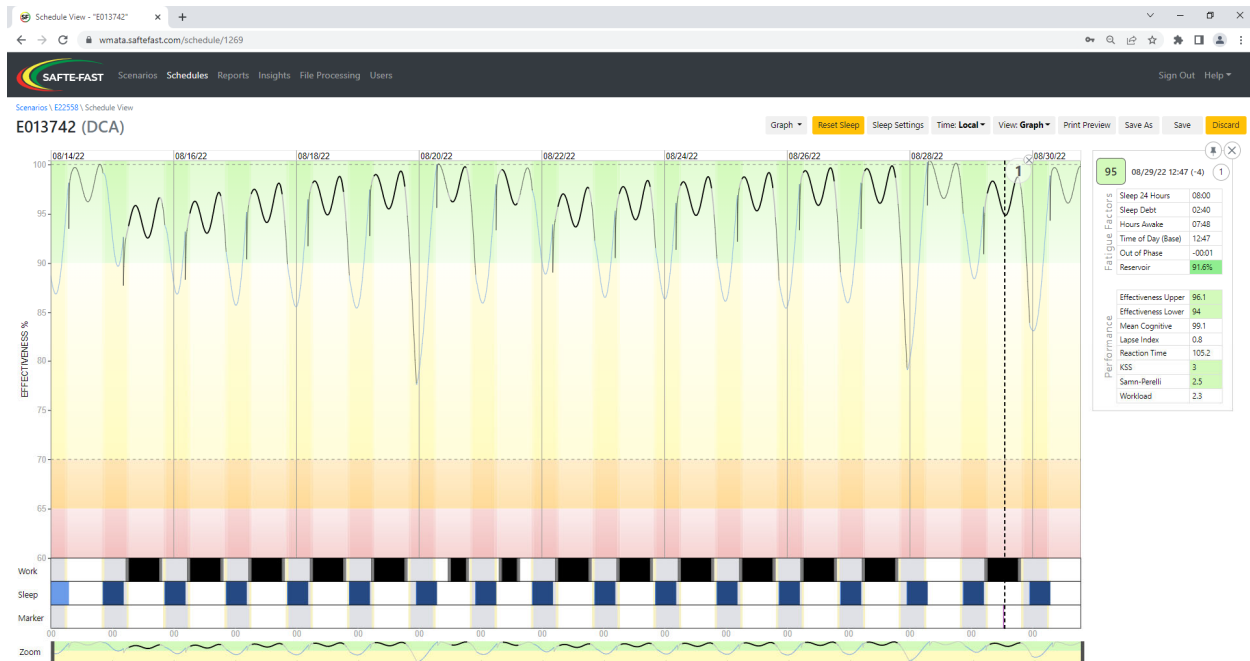
#### *ATCM Mechanic*

Incident data was evaluated for fatigue risk factors. The incident time of day (12:47 hours) does not suggest an increased risk of fatigue-related impairment. The employee worked day shifts for 13 consecutive days and was off-duty on the day preceding the incident. The employee reported a total of 8 hours of sleep in the last sleep period preceding the incident and was awake for 7.8 hours at the time of the incident. The off-duty period preceding the incident was 12 hours long, which provided the opportunity for 7-9 hours of sleep. The employee reported usual workday sleep durations of 7 hours and no issues with sleep.

A biomathematical fatigue modelling application (SAFTE-FAST WebSFC) was used to further evaluate fatigue risk factors that may have been present in the ATC Mechanic's schedule and the effects of the 13 consecutive crewing days. The analysis was based on the ATCM Mechanic's work schedule, reported sleep from the day before the incident, and reported habitual sleep



durations. Estimated performance effectiveness at the time of the incident was 95%. There were no major risk factors for fatigue identified.



Modeling analysis output shows estimated performance effectiveness during the incident work shift and for the week leading up to the work shift, based on the employee work and reported sleep schedule. Estimates were based on the ATC Mechanic's work schedule, reported sleep from the day preceding the incident, and reported habitual sleep durations (8 hours a day). Bold portions of the modeled curve show work (in black) and sleep times (in blue). Effectiveness is shown on the vertical axis, with colored fields in the chart background signifying ranges of effectiveness scores including high effectiveness (>90%) in green, and low effectiveness (<65%) in red. Time is shown on the horizontal axis. Markers for work and sleep times are shown in the lanes above the time of day on the horizontal axis.

### Post-Incident Toxicology Testing

An outside Drug and Alcohol Program determined that the Vehicle Operator 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 Construction Inspector 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 ATCM Mechanic was not in violation of the Drug and Alcohol Policy and Testing Program 7.7.3/6.

### Findings

- Switch 1B was clamped in a reverse position by the ATCM personnel on site at approximately 08:00 hours.
- After Switch 1B was clamped in the reverse position, there were no further requests to alter the alignment. Work practices required the switches to be normalized at the end of the workday.

- The Vehicle Operator received a call from the Construction Inspector instructing them to move the high rail vehicle in the reverse direction, towards the 1B switch.
- The Construction Inspector was not authorized to contact the Vehicle Operator to move the high rail vehicle. Kiewit vehicle movements were only to be ordered from the Kiewit Supervisor, who would act as the flagman for the move.
- The Vehicle Operator did not confirm the request was from a Kiewit Supervisor.
- The Vehicle Operator did not assign a flagman for the move.
- ATCM personnel were not requested to take action on Switch 1B prior to the Hi-Rail vehicle move.

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

- Kiewit removed the Vehicle Operator from service for post-incident toxicology testing.
- Kiewit conducted a stand-down review of track movement policy with all operators.
- CAPD removed the Construction Inspector from service for post-incident toxicology testing.
- ATCM removed the ATCM Mechanic from service for post-incident toxicology testing
- The High Rail Vehicle and Flat car were removed from service for inspection.
- ATCM performed an inspection of switch 1B.
- TRST performed an inspection of the roadway infrastructure and found it to be within tolerance.

### **Probable Cause Statement**

The probable cause of the derailment event on August 29, 2022, was a failure to follow established procedures for vehicle movements within the ACS. The Construction Inspector and Hi-Rail Vehicle Operator both acknowledged that the movement was supposed to be coordinated through the Kiewit supervisor. A Contributing Factor to the event was that the Vehicle Operator moved the unit without a Flagman present, which was also required by procedure.

### **SAFE Recommendations/Corrective Actions**

<b>Corrective Action Code</b>	<b>Description</b>	<b>Responsible Party</b>	<b>Estimated Completion Date</b>
102508_SAFE CAPS_CAPD_001	Conduct a review of track movement policy with all Equipment Operators.	CAPD SRC	Completed
102508_SAFE CAPS_CAPD_002	Vehicle Operator removed from the project.	CAPD SRC	Completed
102508_SAFE CAPS_CAPD_002	Construction Inspector to receive reinstruction on procedures and prevention relating to this event.	CAPD SRC	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.*

#### *Vehicle Operator*

The Vehicle Operator is a Kiewit employee with three years of service and experience as a High Rail Vehicle Operator. The Vehicle Operator received initial High Rail Vehicle Certification with Kiewit in 2019, refresher training is conducted at the start of each project.

The Vehicle Operator stated that they received their daily Job Safety Briefing from the Kiewit Safety Representative, then went to Landover Station to pick up their high rail vehicle. The Vehicle Operator reported they operated the high rail vehicle to New Carrollton Station, track two then waited for further instructions inside the vehicle.

The Vehicle Operator stated that WMATA personnel were transporting equipment via rail vehicles through the interlocking where they were secured and needed to traverse the interlocking from track two to track one. They stated that they were positioned within the interlocking. The Vehicle Operator stated that they received a call on their assigned cellular phone, the caller asked that they move the vehicle backwards. The Vehicle Operator stated that they initially thought the call was from a Kiewit representative, as they normally receive instructions from Kiewit personnel only. The Vehicle Operator reported that they verified with the caller that they needed to move the vehicle now. The caller replied, “yes,” and they began to move the vehicle in reverse. The Vehicle Operator reported they assumed that the caller was on scene as they were giving them the instructions to move the vehicle. The Vehicle Operator stated that they sounded the horn three times and began reversing towards New Carrollton Station. The Vehicle Operator reported as the vehicle passed the switch, they noticed the front of their trailer came off the right side of the tracks. The Vehicle Operator stated that they engaged the air brakes, then contacted their Supervisor to notify them of the incident. The Vehicle Operator stated that normally there is a Kiewit Supervisor present on site to oversee all operations. The Vehicle Operator stated that later they learned a WMATA Employee had called them and instructed them to move the vehicle in reverse to make room for other WMATA vehicles to access track one.

The Vehicle Operator stated that they usually have assistance from another contractor or Supervisor when backing. The Vehicle Operator stated that they assumed the track was clear and that a Supervisor had called them to give the instructions. The Vehicle Operator stated that they received general knowledge on roadway nomenclature, but that are not trained on the operation of switches and interlockings, although they can identify them. The Vehicle Operator stated that the improper communications may have contributed to the incident. The Vehicle Operator reported that Kiewit personnel only receive instructions from the Kiewit Supervisor to avoid miscommunications between work tasks. The Vehicle Operator stated that the WMATA personnel received the Kiewit personnel contact number and that’s how they were contacted directly. The Vehicle Operator reported they were fully alert at the time of the incident and had no issues with sleep.

## *Construction Inspector*

The Construction Inspector is a WMATA employee with eighteen years of service and four years of experience as a Construction Inspector. The Construction Inspector holds a Roadway Worker Protection (RWP) Level 4 certification that expires in April 2023.

The Construction Inspector stated that their shift began at the New Carrollton Station for the ongoing shutdown, as the station is being renovated. The Construction Inspector stated that their responsibility was the overall safety of the roadway for all personnel including contractors at the construction site. The Construction Inspector stated that at the start of their shift, they were informed of the various track moves that needed to be conducted throughout the day. Personnel from ATCM and TRST were present to assist with the movement of the rail vehicles. They were anticipating a Prime Mover to come from New Carrollton Yard on track two. The Construction Inspector stated that they requested assistance from the ATCM personnel to clamp switch 1B to provide the route for the Prime Mover from track two to track one. The Construction Inspector reported that they had one high rail vehicle remaining on track two to conduct additional work while other high rail vehicles had cleared the area.

The Construction Inspector reported that the Prime Mover plans changed, and the Prime Mover did not come out of the yard. They received plans to move rail vehicles from Cheverly Station to New Carrollton Station. The Construction Inspector stated that the vehicles traveled on track two, then were routed to track one once at New Carrollton. The Construction Inspector stated that as the vehicles were approaching New Carrollton, they received information that the high rail vehicle was in their path and needed to move backwards in order for them to pass. The Construction Inspector reported that they called the high rail vehicle operator from the Project Command Center located at the Landover Station and instructed them to move backwards so the other vehicles could traverse the interlocking from track two to track one. The Construction Inspector stated that they later received a call from SAFE stating the high rail vehicle had derailed.

The Construction Inspector stated that they went to New Carrollton Station arriving on scene at the derailment site. They stated that they noticed that switch 1B was still clamped for a reverse move and the high rail vehicle operator had reversed and trailed the switch. The Construction Inspector stated that SAFE and other personnel were already on scene conducting an initial investigation once they arrived. The Construction Inspector stated that not having oversight at the incident location while vehicle operations were being conducted contributed to the derailment. They stated that if the rail vehicle movement was supervised, the incident could have been prevented. The Construction Inspector reported no initial damage was noticed at switch 1B and no personnel were injured. They reported feeling fully alert at the time of the incident and no history of sleep issues.

## *ATCM Mechanic*

The ATCM Mechanic is a WMATA employee with ten years of service and experience as an ATCM Mechanic. The ATCM Mechanic holds a Roadway Worker Protection (RWP) Level 4 certification that expires in January 2023.

The ATCM Mechanic stated that they reported on duty at 06:25 hours on the day of the incident. The ATCM Mechanic stated that they had worked as support since the beginning of the shutdown for Mobile Command by cranking and blocking while installing new ATC equipment. A safety briefing was conducted at the beginning of the shutdown. The ATCM Mechanic stated that on the morning of the incident the Construction Inspector called them on the phone and asked them to crank switch 1B and 1A. The Construction Inspector asked them to crank the switch in reverse for PM-43 to leave the yard to crossover from track two to track one to go to Landover Station.

The ATCM Mechanic stated that they went to New Carrollton Tower to report the move for PM-43 and verified the switches with the Interlocking Operator. The ATC Mechanic stated that PM-43 never arrived.

The ATCM Mechanic stated that they returned to the platform and the incident had already occurred, they did not attempt to assist. The ATCM Mechanic stated that the High Rail Vehicle was on track two at the platform. Mobile Command instructed them to move and to clear switch 1B, so the vehicle was between the station and switches 1B and 3B. The ATC Mechanic stated that they were not sure if the Operator was familiar with their position, the vehicle was extended between 1B and the 3B switches in the middle of the two switches on track two.

The ATCM Mechanic stated that before they leave at 18:30 hours, the interlockings are unclamped and cranked in their normal positions daily. The ATCM Mechanic stated that they usually receive instructions via cellular phone because it's hard to communicate on Ops ten. The ATCM Mechanic reported feeling fully alert at the time of the incident and no history of sleep issues to report.

## Appendix B – ROCC Incident Report

### View Approved Incident Report

INCIDENT ID: 2022241ORANGE4					
<b>DATE</b> 2022-08-29	<b>TIME</b> 1300	<b>LINE</b> Orange	<b>ITEM</b> 4		
<b>LOCATION (STATION/YARD)</b> New Carrollton (D13)		<b>LOCATION/CHAIN MARKER (If Applicable)</b> D2-591+00		<b>REPORTED BY</b> Mission Assurance Coordinator	
<b>TRAIN ID</b> 000	<b>DIRECTION</b> N/A	<b>TRACK NUMBER</b> N/A	<b>DEPTS NOTIFIED</b> Everbridge Alert/Messaging		
<b>CAR NUMBERS (XXXX-XXXX)</b> Lead Car					
-					
Caused Issue <input type="checkbox"/>		Caused Issue <input type="checkbox"/>		Caused Issue <input type="checkbox"/>	
<b>TRBL CODE</b> DRAL- DERAILMENT		<b>RESP CODE</b> CON			
<b>TYPE INCIDENT</b> Report Of Derailment in the ACS on the D-Line.					
<b>ACTION PLAN</b> Document Event					
<b>DELAYS IN MINUTES</b>					
<b>LINE</b>	<b>INCIDENT</b>	<b>TRAIN</b>	<b>TOTAL DURATION</b>		
0	0	0	0		
<b>TRIPS MODIFIED</b>					
<b>PARTIAL</b>	<b>GAP TRAIN</b>	<b>LATE DISPATCHES</b>	<b>REROUTED</b>	<b>NOT DISPATCHED</b>	<b>OFFLOADS</b>
0	0	0	0	0	0
<b>FIVE PRIMARY CONSOLE INDICATIONS</b>					
<b>BCP</b>	<b>BRAKES ON ILLUMINATED</b>	<b>ALL DOORS CLOSED ILLUMINATED</b>	<b>AUTO\MANUAL ILLUMINATED</b>	<b>BPP</b>	
			AUTO		
<b>INCIDENT CHRONOLOGY</b>					
<b>TIME</b>	<b>DESCRIPTION</b>				
1300	Mission Assurance Coordinator in the ROCC reported that a Kewit contractor High Rail Vehicle (03-135241), derailed at CM D2-259+00. No injuries or damages reported. SAFE and all appropriate personnel notified.				

ROCC Incident Report, Page 1 of 2

Incident Date: 08/29/2022 Time: 12:47 hours  
Final Report – Derailment  
E22558

Drafted By: SAFE 707 – 10/27/2022  
Reviewed By: SAFE 71 – 10/28/2022  
Approved By: SAFE 71 – 10/28/2022

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## View Approved Incident Report

**MAXIMO TICKET#**  
8620934

REPORT PREPARED BY	NAME	CLICK TO SIGN
RADIO CONTROLLER 1		✓
BUTTON CONTROLLER 1		
RADIO CONTROLLER 2		
BUTTON CONTROLLER 2		

### SUPERINTENDENTS OR ASSISTANTS SECTION

**ADDITIONAL FOLLOW-UP CORRECTIVE  
ACTIONS OR REMARKS**

**FOLLOW-UP INFORMATION OBTAINED FROM  
SUPPORT DEPARTMENTS**

**NOTIFICATIONS/PAGE GROUPS** #1/CEO ☐ #2/DGM &BELOW ☒

**ADDITIONAL NOTIFICATIONS MADE BY  
PHONE** MAC

APPROVED BY	NAME	CLICK TO SIGN
REPORT APPROVED BY SUPT. OR ASST SUPT.		✓

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ROCC Incident Report, Page 2 of 2

## Appendix C – Kiewit Initial Incident Alert Form

### Initial Incident Alert

Minor Potential

ID# 2022082900766

Date: 29-Aug-2022 (13:00)

District: Eastern

Location: Onsite - track 2 southside of station

Project: 104893 - WMATA Station Platforms Rehab Contract 4

Classification(s): Near Miss (Employee)

Category: TRACK

Account Code: 30.03\_Operational Support and Compliance

Job Task: Equipment Operation

Initial Summary: While back up the Hi-Rail on track 2, the operator was unaware the the track switches were not set in the right position causing a derailment of the hi-rail cart.

#### Incident Description:

An operator received instruction to move hi-rail on tracks from an unknown source at the time. The operator began to move the hi-rail, believing that the person on the phone was spotting him but without following track movement protocol, and was unaware that the track switches were not in place for his movement. This resulted in the front two wheels to derail on the Hi-rail cart.

#### Contributing Factors and Corrective Actions:

**1. Following Procedures (Planning)-Inadequate / No Permit - Permit not followed:** operator conducted a rail movement without following the project rail movement policy.

**Safety Process Improvement - Process / Policy / Procedure - Develop:** Review of track movement policy will be review to all operators.

Responsible Person: [REDACTED]

Due Date: 09-Sep-2022

Status: Scheduled

**2. Improper placement of tools - equipment or materials-Tools - Equipment & Vehicles:** Track switch was not set in the correct position

General Task - Coach / Train: NONE

Responsible Person: [REDACTED]

Due Date: 09-Sep-2022

Status: Scheduled



Report Ran: 9/6/2022 Time: 1:26:25 PM by: [REDACTED]

**Kiewit Safe**

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Kiewit Initial Incident Alert Form, Page 1 of 2

Incident Date: 08/29/2022 Time: 12:47 hours  
Final Report – Derailment  
E22558

Drafted By: SAFE 707 – 10/27/2022  
Reviewed By: SAFE 71 – 10/28/2022  
Approved By: SAFE 71 – 10/28/2022

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Report Ran: 9/6/2022 Time: 1:26:25 PM by: [REDACTED]

**Kiewit Safe**

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Kiewit Initial Incident Alert Form, Page 2 of 2

Incident Date: 08/29/2022 Time: 12:47 hours  
Final Report – Derailment  
E22558

Drafted By: SAFE 707 – 10/27/2022  
Reviewed By: SAFE 71 – 10/28/2022  
Approved By: SAFE 71 – 10/28/2022

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## Appendix D - Root Cause Analysis

