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W-0295 – Collison at Twinbrook Station – December 9, 2023

Document Purpose

This WMSC written report on WMATA Metrorail's safety event investigation and review of Metrorail's findings in accordance with the WMSC Program Standard, in conjunction with the attached Metrorail investigation report that has undergone WMSC staff review, feedback, and Metrorail revision, describes the investigation activities, identifies factors causing or contributing to the accident, and sets forth ongoing, additional, or upcoming corrective actions and further oversight work (such as inspections and audits) as necessary or appropriate. The WMSC's ongoing oversight during the investigative process, including safety event reporting and verification, participation in investigative interviews, data review, consistent communication with the Metrorail investigations team, and feedback on Metrorail's reports leads to further improvements prior to consideration of the reports by WMSC Commissioners for adoption. The WMSC's safety event investigation oversight assures the sufficiency and thoroughness of Metrorail's investigations. The WMSC Commissioners are considering these documents (the WMSC review and Metrorail's investigation report) as a unified item for adoption at the Washington Metrorail Safety Commission meeting on June 11, 2024.

WMSC staff recommend adoption of this investigation.

Safety event summary:

On Saturday, December 9, 2023, a Tie Crane (TC-07) collided with the tunnel portal entrance between Twinbrook and North Bethesda stations, causing the Equipment Operator to be thrown through the front windshield of the vehicle onto the roadway. The Equipment Operator sustained non-life-threatening injuries.

TC-07, a roadway maintenance machine (RMM), was routed from Shady Grove Yard to Twinbrook station using Track 1 in an established work zone that was a part of a weekend shutdown. As the Tie Crane departed Twinbrook Station as part of a convoy heading toward North Bethesda Station, the Tie Crane's boom struck the portal entrance. Review of closed-circuit television as part of this investigation showed that boom was unsecured when TC-07 entered the platform limits at Twinbrook station, prior to the collision. The unsecured boom increased the clearance height of the vehicle.

The Tie Crane did not have a seat belt for the operator. The Equipment Operator was ejected through the vehicle's front windshield onto the roadway. The Equipment Operator contacted the Radio Rail Traffic Controller in the Metro Intergrated Command and Communications Center (MICC) via radio and reported that they were holding, unable to move the unit, and needed a road mechanic. They did not specify that their vehicle struck the portal entrance or that they had been ejected from the vehicle.

The MICC Assistant Operations Manager and Office of Track and Structures (TRST) Supervisor were notified. When the Track and Structures Supervisor arrived at the location, the collision was reported to the MICC, and emergency response was requested.

The Equipment Operator was transported to a hospital and treated for non-life-threatening injuries.

The Track and Structures Supervisor noted damage (chipping) to the concrete at the portal entrance.

TC-07 was towed to Shady Grove Yard for post-event inspection.

The causes and contributing factors include:

- Failure to adhere to written policies and procedures
- Lack of oversight to ensure compliance with written policy

Corrective action as a result of this investigation:

- Metrorail developed a Personnel Notice to ensure restraint systems are utilized where available
- Equipment Operator attended retraining
- Metrorail conducted an audit to ensure all existing RMMs have restraint systems
- Metrorail updated maintenance instructions to inspect the restraint system during scheduled maintenance
- Metrorail is retrofitting existing RMMs without restraint systems with appropriate restraint systems (Scheduled completion date January 2025)

Examples of other related ongoing corrective actions

Metrorail has also been addressing non-compliance with written operational rules and procedures through CAP C-0181, which addresses the finding that elements of Metrorail have a culture that accepts noncompliance with written operational rules, instruction, and manuals (Scheduled completion October 2024)

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

FINAL REPORT OF INVESTIGATION A&I E23878

Date of Event:	December 9, 2023
Type of Event:	A3 - Collision
Incident Time:	01:23 hours
Location:	Twinbrook Station, Track 1 Chain Marker (CM) A1 674+00
Time and How received by SAFE:	01:41 hours/MAC Notification
WMSC Notification Time:	02:00 hours
Responding Safety Officers:	None
Rail Vehicle:	Tie Crane (TC-07)
Injuries:	Minor Injuries
Damage:	Vehicle and Infrastructure Damage
Emergency Responders:	None
SMS I/A Number	20231209#113275

Twinbrook Station – Collision

December 9, 2023

Table of Contents

Abbreviations and Acronyms

AIMS	Advanced Information Management System
AOM	Assistant Operations Manager
ARS	Audio Recording System
CCTV	Closed-Circuit Television
CM	Chain Marker
ERT	Emergency Response Team
FCFRD	Fairfax County Fire and Rescue Department
MICC	Metro Integrated Command and Communications Center
MOR	Metrorail Operating Rulebook
MTPD	Metro Transit Police Department
NOAA	National Oceanic and Atmospheric Administration
OM	Operations Manager
RTC	Rail Traffic Controller
RTRA	Office of Rail Transportation
SAFE	Department of Safety
SMS	Safety Measurement System
TRST	Office of Track and Structures
WMATA	Washington Metropolitan Area Transit Authority
WMSC	Washington Metrorail Safety Commission

Executive Summary

**Note that all times listed are approximate and may contain minor variations due to differences between systems of record. **

On Friday, December 8, 2023, at 23:50 hours, Mobile Command contacted the Metro Integrated Command and Communications Center (MICC) to establish a work zone for a weekend shutdown utilizing a Red Tag Power Outage with Inaccessible Track (IT) protection between Grosvenor Station and Shady Grove Station at Chain Markers (CM) A1 601+01 – 947+92 and A2 570+22 – 947+22. Roadway Maintenance Machine (RMM) Tie Crane (TC-07) was routed to Twinbrook Station by way of Track 1 from Shady Grove Yard.

Closed-Circuit Television (CCTV) determined that on Saturday, December 9, 2023, at 01:17 hours, TC-07 entered the platform limits of Twinbrook Station, track 1, with its boom unsecured, increasing the clearance height of the unit.

At 01:23 hours, after departing Twinbrook Station, the boom attached to TC-07 collided with the portal entrance located between Twinbrook Station and North Bethesda Station at CM A1 674+00. The collision caused the Equipment Operator to be ejected from the front seat of the vehicle, through the front windshield, landing in the roadway.

The Equipment Operator contacted the Radio Rail Traffic Controller (RTC), reported the event, and requested assistance. The Button RTC notified the Assistant Operations Manager (AOM) and Office of Track and Structures Supervisor of the event.

The TRST Supervisor assessed the incident and reported damage to TC-07 and chipping at the portal entrance, where a pre-existing crack was located in the concrete.

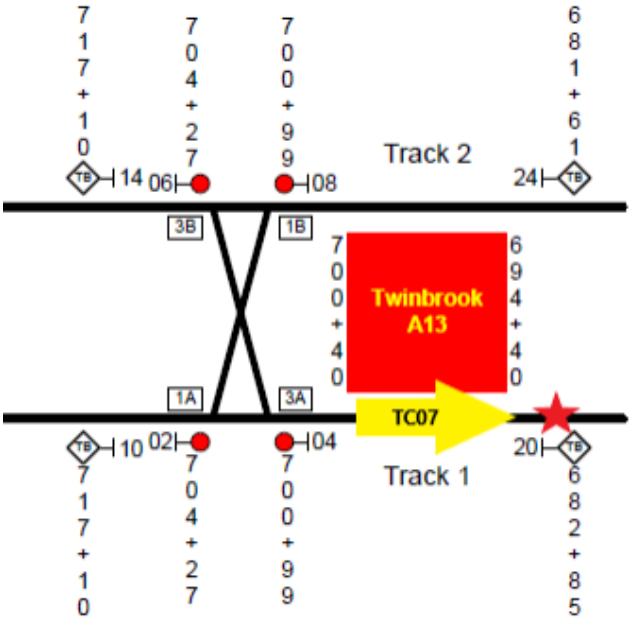
The Equipment Operator was transported to Shady Grove Hospital for treatment. TC-07 was towed to Shady Grove Yard post-incident inspection.

The probable cause of the Collision event on December 9, 2023, at Twinbrook Station was inattention by the Equipment Operator when they failed to secure the boom prior to moving the unit. The injuries sustained by the Equipment Operator occurred as a result of a lack of restraint system within the operator's cabin of the vehicle.

Incident Site

Portal between Twinbrook Station and North Bethesda Station - CM A1 674+00.

Field Sketch/Schematics



The approximate incident site is notated by a red star.
The above depiction is not to scale.

Purpose and Scope

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

Investigative Methods

The investigative methodologies included the following:

- Physical Site Assessment through document and video review

- Formal Interviews – SAFE interviewed one individual 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 individual:
    - Equipment Operator

- Informal Interviews – Collected through conversations with individuals during the investigation to provide background and supporting information. Written statements were reviewed from personnel present during the event.

- Documentation Review – Collection of relevant work history information and process documentation contained in WMATA systems of record. These records include:
    - Equipment Operator Training Records
    - Equipment Operator Certifications
    - Equipment Operator 30-day work history review
    - Metrorail Operating Rulebook (MOR)
    - National Oceanic and Atmospheric Administration (NOAA)

- Rail Operations Control Center (ROCC) Incident Report
- Maximo Data

- System Data Recording Review – Collection of information contained in Metro Data Recording Systems. This data includes:
  - ARS (Audio Recording System) playback [Radio and Landline Communications]
  - The Office of Chief Mechanical Officer (CMOR) Incident Investigation Team (IIT) Vehicle Monitoring and Diagnostic System (VMDS)
  - Closed-Circuit Television (CCTV)
  - Witness Statements

Investigation

On Friday, December 8, 2023, at 23:50 hours, Mobile Command established a work zone utilizing a Red Tag Power Outage with Inaccessible Track (IT) protection between Grosvenor Station and Shady Grove Station (CM A1 601+01 – 947+92 and A2 570+22 – 947+22). Mobile Command also advised that multiple Class 2 vehicles were in the work area, including TC-07, which was routed to Twinbrook Station by way of Track 1 from Shady Grove Yard as part of a weekend shutdown.

On Friday, December 9, 2023, at 00:59 hours, the Equipment Operator of TC-07 advised the MICC Radio RTC that they were en route to Twinbrook Station as the fourth unit in a convoy via track 1.

At 01:17 hours, CCTV observed TC-07 enter the platform limits of Twinbrook Station on track 1. TC-07's boom was observed unsecured, which increased the clearance height of the unit.

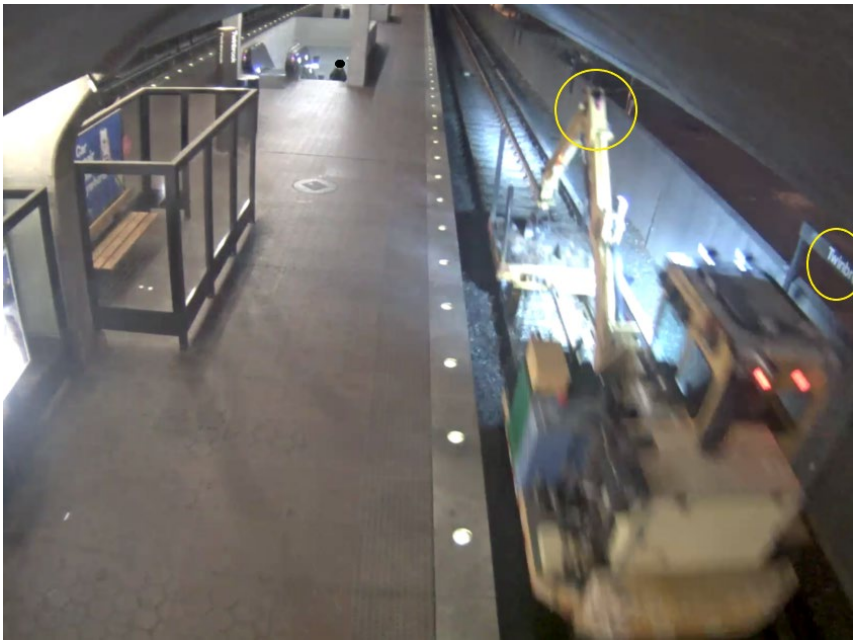


Image 1 - TC-07 traversing *Twinbrook Station, track 1 at 01:17 hours with the boom elevated.*

The Advanced Information Management System (AIMS) revealed that at 01:23 hours, TC-07 stopped moving at the portal between Twinbrook Station and North Bethesda Station at CM A1 674+00, inferring the boom impacted the portal entrance.

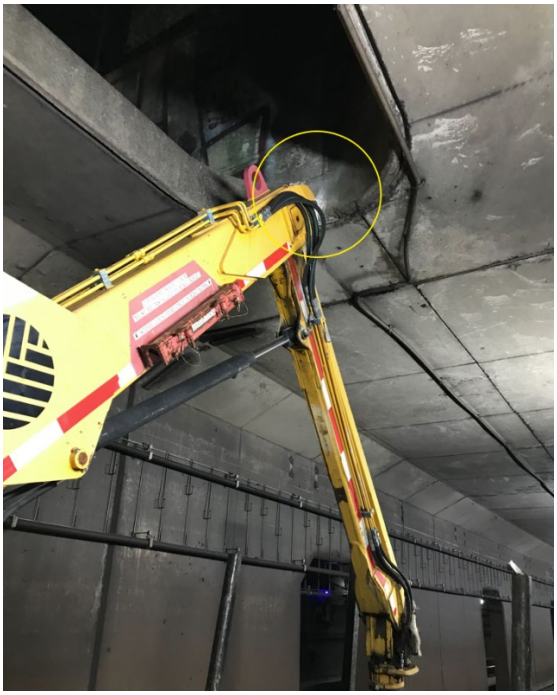


Image 2 - TC-07 stopped at the point of rest at CM A1 674+00.

At 01:26 hours, the Equipment Operator of TC-07 advised the Radio RTC that they were holding at the portal near Twinbrook Station, unable to move. They also requested a Road Mechanic to meet them on the scene. The Button RTC contacted a TRST Supervisor to dispatch assistance.

At 01:29 hours, the Equipment Operator of Spot Tamper (ST-02) advised the Radio RTC that they were holding behind TC-07 and would hold their position in case recovery of TC-07 is required. At 01:35 hours, the TRST Supervisor advised the Button RTC that the Equipment Operator of TC-07 had made contact with the portal.

At 01:37 hours, the Button RTC advised the AOM of the incident. They also advised the AOM that there were communication issues with TC-07. At the same time, the TRST Roadway Worker in Charge (RWIC) arrived on the scene and requested foul time from Twinbrook Station, track 1 to CM A1 674+00.

At 01:47 hours, the Radio RTC provided an absolute block to ST-02 from CM A1 674+00 to Twinbrook Station to retrieve the TRST RWIC. At 01:51 hours, the Equipment Operator of ST-02 advised the Radio RTC that all personnel were ready to move to CM A1 674+00.

At 01:53 hours, the Radio RTC inquired if the Equipment Operator of TC-07 had sustained any injuries. The Equipment Operator stated they had not. The Radio RTC then requested that the Equipment Operator conduct a ground walk-around of TC-07.

At 01:54 hours, the TRST RWIC arrived at TC-07 and requested foul time to inspect the scene. At 01:58 hours, the TRST RWIC relayed to the Button RTC that there was damage to TC-07 but no damage to the portal where the boom had impacted the portal. It was further advised that the Equipment Operator of TC-07 had been ejected from TC-07 through the front windshield and sustained minor injuries. They further advised that track 2 was clear for movement. The Button RTC assigned the TRST RWIC as the On-Scene Commander.

At 01:59 hours, the Mission Assurance Coordinator (MAC) contacted the Safety Director On-Call (SDOC). At 02:00 hours, the MAC contacted the Washington Metrorail Safety Commission (WMSC).

At 02:04 hours, the TRST RWIC advised the Radio RTC that the Equipment Operator of TC-07 had boarded ST-02 and was ready to return to the Twinbrook Station platform and that all personnel were clear of the roadway for the move. The TRST RWIC further advised that they had relinquished foul time. The Radio RTC acknowledged and granted permission for ST-02 to move back to the Twinbrook Station platform by way of track 1.

At 02:09 hours, CCTV revealed that ST-02 transported the Equipment Operator of TC-07 to Twinbrook Station by way of track 1 to meet with a Supervisor who then transported them from the scene for medical attention.

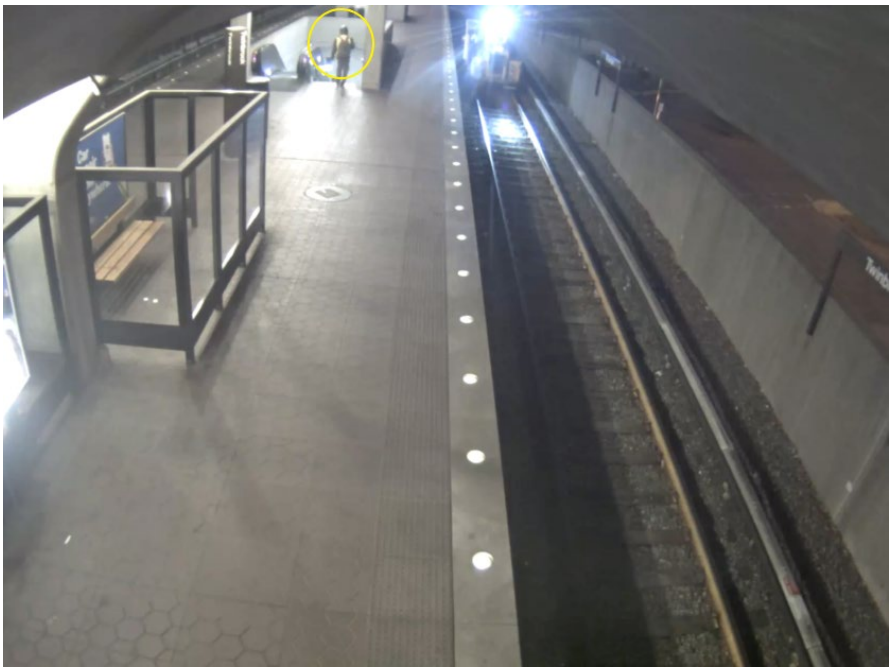


Image 3 - ST-02 transporting the Equipment Operator of TC-07 to Twinbrook Station by way of track 1 at 02:09 hours.

At 03:26 hours, a Road Mechanic advised the Button RTC that a new Equipment Operator was on the scene with TC-07 and that they would move the unit to Twinbrook Station, where it would be recovered by Prime Mover PM-46.

At 03:37 hours, TC-07 arrived within the platform limits of Twinbrook Station, track 1.

Image 4 - TC-07 arrived at Twinbrook Station by way of track 1 at 03:37 hours.

At 05:02 hours, PM-46 arrived at Twinbrook Station in order to recover TC-07.

Image 5 - PM-46 at Twinbrook Station at 05:02 hours.

At 05:17 hours, the Equipment Operator of PM-46 advised the Radio RTC that TC-07 was connected and ready to move to Shady Grove Yard from Twinbrook Station.

At 05:19 hours, PM-46 commenced towing TC-07 to Shady Grove Yard.

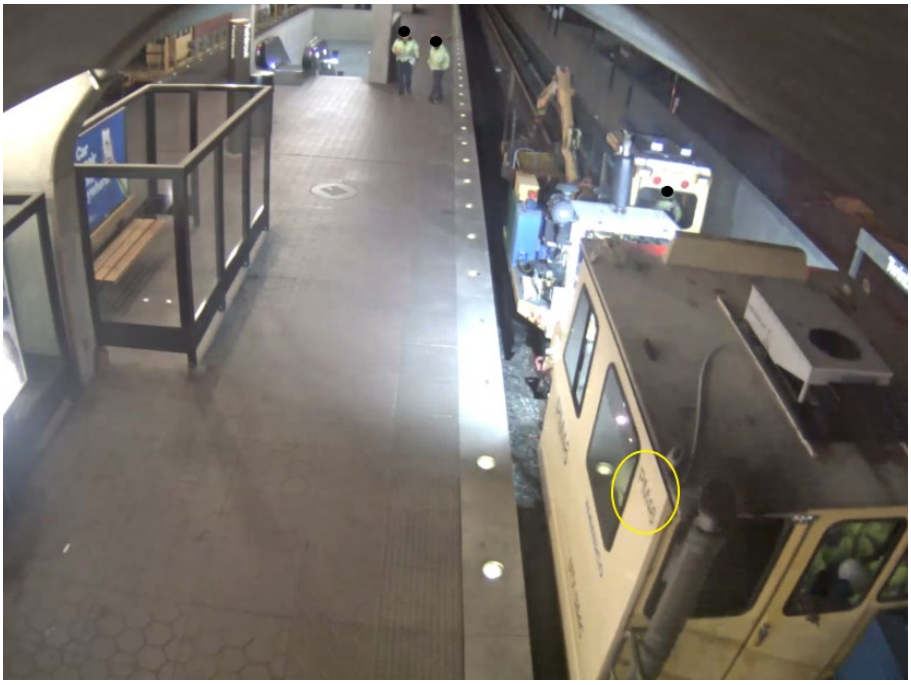


Image 6 - PM-46 departed *Twinbrook Station at 05:19 hours..*

An assessment of the portal for infrastructure damage was conducted after the incident. TRST determined that there was minor damage to the portal and that there was a pre-existing crack in the concrete where the surface had been chipped away by the impact; structural damage was not present.

Image 7 - Superficial chipping of the portal was observed during an inspection by TRST.

TRST confirmed that TC-07's boom was not locked into place during travel, allowing for the boom to impact the portal. The collision, coupled with the unit not having a seat belt, caused the Equipment Operator to be ejected from the unit through the windshield and landing on the roadway.

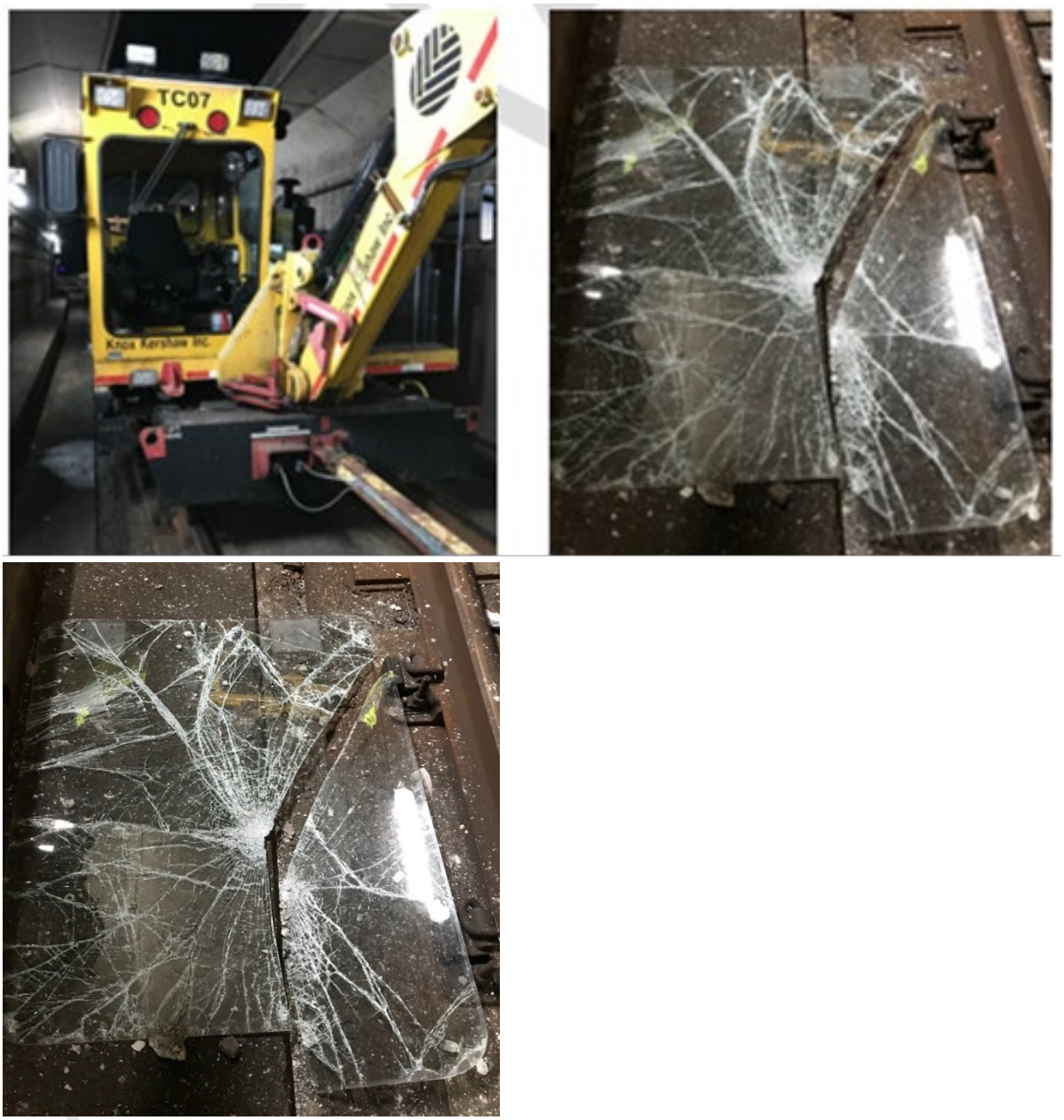


Image 8 - The Equipment Operator's seat of TC-07 and the shattered glass from TC-07.

Image 9 - TC-07's main cabin and seat are not equipped with seat belts.

Chronological Event Timeline

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

Time	Description
December 8, 2023	
23:50:52 hours	Mobile Command RWIC: Contacted the MICC to establish a Red Tag Power Outage with IT protection for the weekend work site between CM A1 601+01 – 947+92 and A2 570+22 – 947+92. Advised that they had multiple units from multiple yards, including TC-07, heading toward Twinbrook Station. Radio RTC: Acknowledged, repeated back, and advised them to stand by and stand clear. [Radio Ops 1]
December 9, 2023	
00:59:18 hours	Equipment Operator of TC-07: Advised that they were en route to Twinbrook Station as fourth in the convoy via track 1. Radio RTC: Acknowledged. [Radio Ops 1]
01:17:00 hours	TC-07 was observed moving through Twinbrook Station. [CCTV]
01:23:00 hours	TC-07 stops suddenly at the portal located at CM A1 674+00. [AIMS]
01:26:08 hours	Equipment Operator of TC-07: Advised the Radio RTC that they were holding at the Portal of Twinbrook Station, unable to move. Requested a Road Mechanic to the scene. Radio RTC: Acknowledged. [Radio Ops 1]
01:26:47 hours	Button RTC: Requested TRST send a Road Mechanic to the scene. TRST Supervisor: Acknowledged. [Phone, Red Line]

Time	Description
01:27:52 hours	Button RTC: Advised the AOM that a road mechanic was en route to the scene of the incident. AOM: Acknowledged. [Phone, Ops 1]
01:29:23 hours	Equipment Operator of ST-02: Advised the Radio RTC that they were holding behind TC-07 and would hold position in case recovery of TC-07 is required. Radio RTC: Acknowledged. [Radio Ops 1]
01:35:24 hours	TRST Supervisor: Reported the Button RTC that the Equipment Operator of TC-07 contacted the portal with the boom. Radio RTC: Acknowledged. [Phone, Red Line]
01:37:20 hours	Button RTC: Advised the AOM that TC-07 boom made contact with the portal and reported communications issues with TC-07. AOM: Acknowledged. [Phone, Red Line]
01:37:54 hours	TRST RWIC: Requested foul time from Twinbrook Station platform to CM A1 674+00 to inspect TC-07. Radio RTC: Acknowledged, standby while protection is set up. Equipment Operator of ST-02: Requested to retrieve the TRST RWIC and team. Radio RTC: Acknowledged. [Radio, Ops 1]
01:47:41 hours	Radio RTC: Provided an absolute block for ST-02 from CM A1 674+00 to Twinbrook Station to retrieve the TRST Team. Equipment Operator of ST-02: Acknowledged. TRST RWIC: Acknowledged. [Radio, Ops 1]
01:51:42 hours	Equipment Operator of ST-02: Advised the Radio RTC ready to move. Radio RTC: Granted an absolute block to ST-02 to TC-07's position. Equipment Operator of ST-02: Acknowledged. [Radio, Ops 1]
01:53:14 hours	Radio RTC: Inquired if any injuries were sustained. Equipment Operator of TC-07: Responded, "Negative." Radio RTC: Requested from the Equipment Operator of TC-07 if they could perform a ground walk-around. Equipment Operator of TC-07: Responded, "Affirmative." [Radio, Ops 1]
01:54:22 hours	Equipment Operator of ST-02: Advised located at A1 674+00, 10 feet behind TC-07. Radio RTC: Acknowledged and granted foul time to the TRST RWIC and requested information on damages to the infrastructure. TRST RWIC: Acknowledged. [Radio, Ops 1]
01:58:00 hours	TRST RWIC: Advised the Button RTC that there was damage to TC-07 but no damage to the portal where the boom made impact. Advised the Equipment Operator of TC-07 had been ejected from TC-07 through the front windshield and sustained minor injuries and advised that track 2 was clear for movement. Button RTC: Acknowledged and advised that they were the On Scene Commander. [Phone, Red Line]
01:59:04 hours	MAC: Advised the SDOC of the incident. SDOC: Acknowledged. [Phone, MAC]
02:00:49 hours	MAC: Advised the WMSC of the incident. WMSC: Acknowledged. [Phone, MAC]
02:04:10 hours	TRST RWIC: Advised the Radio RTC that ST-02 had loaded up the Equipment Operator of TC-07 ready for transport back to the Twinbrook Station platform and that all personnel were clear of the roadway for the move. Advised that they had relinquished foul time.

Drafted By: SAFE 705 02/06/2024
Reviewed By: SAFE 704 02/06/2024
Approved By: SAFE 707 – 02/07/2024

Time	Description
	Radio RTC: Acknowledged and provided permission for ST-02 to move back to the Twinbrook Station platform by way of track 1. Equipment Operator of ST-02: Acknowledged. [Radio Ops 1]
02:09:00 hours	*ST-02 transported the Equipment Operator of TC-07 to Twinbrook Station by way of track 1 to a supervisor who transported them from the scene for medical attention.[CCTV]*
02:09:43 hours	Equipment Operator of ST-02: Advised that they were located at Twinbrook Station. Radio RTC: Acknowledged. [Radio Ops 1]
02:25:27 hours	MAC: Advised the MTPD Dispatcher of the incident. MTPD Dispatcher: Acknowledged. [Phone, MAC]
02:48:36 hours	Radio RTC: Advised Mobile Command that their work zone between CM A1 601+01 – 947+92 and A2 570+22 – 947+92 and that ST-02 and TC-07 were still in their previous locations. RTC granted permission for IT protection. Mobile Command: Acknowledged, repeated back, and advised all units to switch to OPS 12. [Radio Ops 1]
03:26:32 hours	Road Mechanic: Advised the Button RTC that a new Equipment Operator was on scene with TC-07 and that they would move the unit to Twinbrook Station where it would be recovered by PM-46. Button RTC: Acknowledged. [Phone, Red Line]
03:37:00 hours	*TC-07 arrived at Twinbrook Station.[CCTV]*
05:02:00 hours	*PM-46 arrived at Twinbrook Station to recover TC-07. [CCTV]*
05:17:20 hours	Equipment Operator of PM-46: Advised that TC-07 was connected and ready to move to Shady Grove Yard by way of track 1 from Twinbrook Station. Radio RTC: Acknowledged and granted permission to move towards Shady Grove Yard. [Radio Ops 12]
05:19:00 hours	*PM-46 commenced moving TC-07 to Shady Grove Yard. [CCTV]*

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

Interview Findings

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

TRST Equipment Operator (TC-07) – Formal Interview

- The Equipment Operator stated they were setting up for the shutdown prior to the incident occurring.
- The Equipment Operator stated they were operating TC-07 at the time of the incident while pushing a rail cart without the boom crane secured.
- The Equipment Operator stated that they hit the top of the portal with the boom crane at the incident site and that the impact caused them to eject through the front windshield from the operator's cabin.
- The Equipment Operator stated they had not pushed a cart with the equipment before and were not instructed to do so.
- The Equipment Operator stated that the cart did not serve a function at that time and was "in the way."
- The Equipment Operator stated they "misjudged" the height of the crane boom prior to impact with the portal.

- The Equipment Operator stated they then contacted the MICC and were transported back to the Twinbrook Station platform, where they were then taken to Shady Grove Hospital.
- The Equipment Operator stated the implementation of a seatbelt would have been useful to avoid the injuries they sustained.

Advanced Information Management System (AIMS)

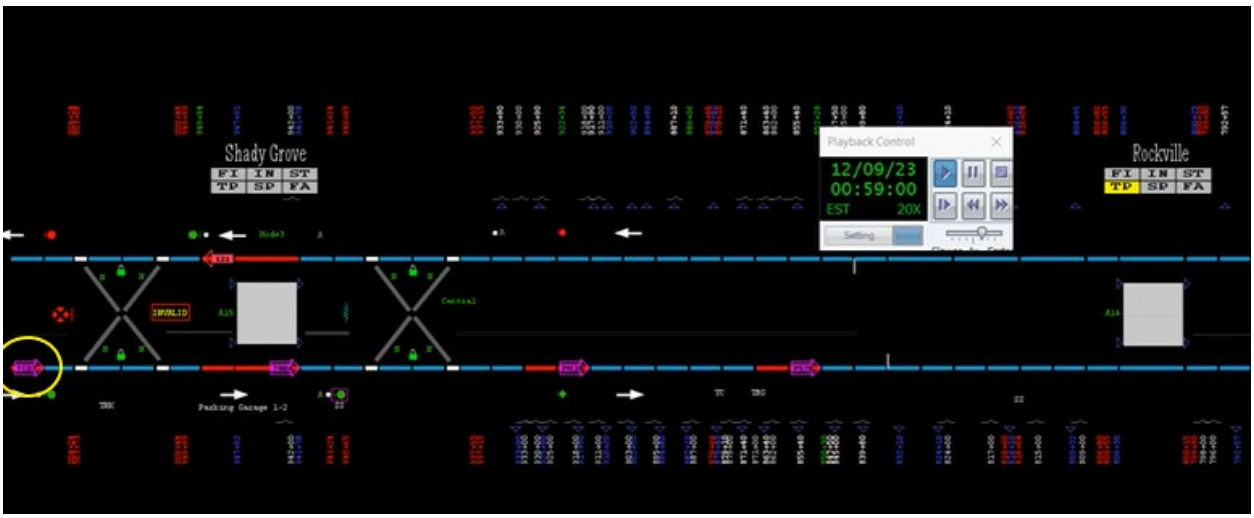


Figure 1: TC-07, the fourth in the convoy, as it leaves Shady Grove Station at 00:59 hours.

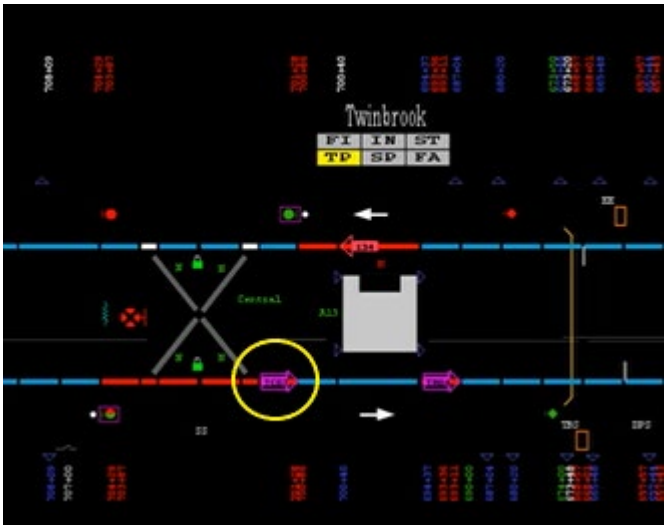


Figure 2: TC-07 approaching Twinbrook Station at 01:17 hours.

Drafted By: SAFE 705 02/06/2024
Reviewed By: SAFE 704 02/06/2024
Approved By: SAFE 707 – 02/07/2024

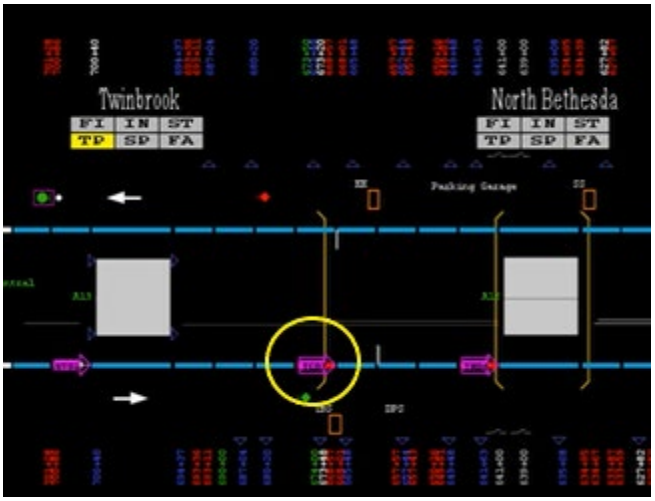


Figure 3: TC-07 stopped at CM A1 674+00 01:23 hours, as ST-02 approached Twinbrook Station, track 1 from behind.

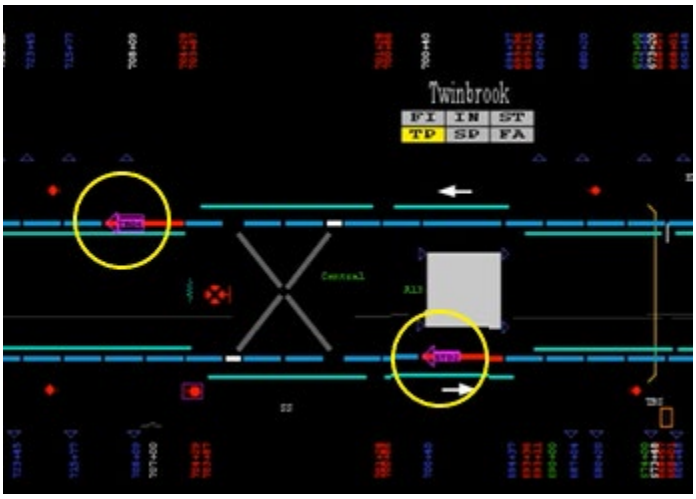


Figure 4: TC-07 arrived at Twinbrook Station Platform at 03:37 hours.

The Office of Systems and Software (OSS)

OSS took a measurement of the path of TC07 prior to impact and determined that the average speed of TC07 was approximately 16 MPH.

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

No communication issues were identified as contributing to the incident.

Office of Track and Structures (TRST)

Liaison with senior TRST personnel determined that the Equipment Operator had been disciplined due to not securing the tie crane appropriately. It was also determined that the Equipment Operator has been scheduled for retraining, and an audit has been commenced of all existing equipment to ensure restraint devices are installed.

Office of Car Track Equipment Maintenance (CTEM)

Liaison with senior CTEM personnel determined that TC-07 should have been equipped with a seatbelt or restraint system; however, it was not. This was an unusual occurrence as the other tie crane RMMs all had functioning seatbelts.

CTEM personnel further determined that this was an oversight of their inspections and have established an update to their procedures that includes this in their monthly inspections.

CTEM also conducted an audit of all existing RMMs and found several without functioning restraint systems, including equipment that was never designed to be equipped with a restraint system. CTEM has stated they intend to rectify this by retrofitting restraint systems across all RMMs.

Weather

On December 9, 2023, at the time of the incident, NOAA recorded the temperature as 36°F, with some cloud cover, winds 3.5 mph, and 82% humidity. The weather was not a contributing factor in this incident. Weather source: NOAA – Location: Rockville, MD.

Related Rules and Procedures

- MOR 11.12 Securing Roadway Maintenance Machines
- MOR 11.22 Use of Booms and Cranes

Human Factors

Fatigue

Signs and Symptoms of Fatigue

Conditions at the time of the incident were evaluated to distinguish whether evidence of fatigue was present. No video of the incident was reviewed for behaviors suggesting fatigue. The employee reported feeling fully alert at the time of the incident.

Fatigue Risk

Incident data was evaluated for fatigue risk factors. There were no significant risk factors for fatigue identified. The incident time of day (01:23 hours) does not suggest an increased risk of fatigue-related impairment. The employee worked evening shifts (22:00 – 06:00 hours) in the days leading up to the incident. The employee reported 6 hours of sleep in the last sleep period preceding the incident and was awake for 12.38 hours at the time of the incident.

The employee was off duty for a total of 16 hours, which provided the opportunity for 7-9 hours of sleep. The employee reported usual workday sleep durations of 6 hours and no issues with sleep.

Post-Incident Toxicology Testing

WMATA's Drug and Alcohol Program determined that the personnel involved complied with the Drug and Alcohol Policy and Testing Program 7.7.3/6.

Findings

- The boom attached to TC-07 was unsecured and collided with the portal entrance at CM A1 674+00.
- The Equipment Operator of TC-07 was ejected through the windshield and landed on the roadway.
- The Equipment Operator stated they “misjudged” the height of the crane boom prior to impact with the portal.
- TC-07 was not equipped with a seat belt or restraint system.
- TC-07 was the only tie crane not equipped with a restraint system.

Immediate Mitigation to Prevent Recurrence

- The Equipment Operator of TC-07 was transported for assessment at a medical hospital.
- TC-07 was removed from service and towed to Shady Grove Yard.

Probable Cause Statement

The probable cause of the Collision event on December 9, 2023, at Twinbrook Station was inattention by the Equipment Operator when they failed to secure the boom prior to moving the unit. The injuries sustained by the Equipment Operator occurred as a result of a lack of restraint system within the operator’s cabin of the vehicle.

Recommended Corrective Actions

Corrective Action Code	Description	Responsible Party	Estimated Completion Date
113275_SAFE CAPS_TRST_ 001	Develop a Personnel Notice to ensure restraint systems are utilized where available.	TRST SRC	03/31/2024
113275_SAFE CAPS_TRST_ 002	Equipment Operator to attend retraining.	TRST SRC	Completed
113275_SAFE CAPS_CTEM _001	Conduct an audit to ensure all existing RMMs have restraint systems.	CTEM SRC	03/31/2024
113275_SAFE CAPS_CTEM _002	Update maintenance instructions to inspect the restraint system during scheduled maintenance.	CTEM SRC	Completed
113275_SAFE CAPS_CTEM _003	Retro-fit existing RMMs without restraint systems with appropriate restraint systems.	CTEM SRC	01/01/2025

Appendices

Appendix A – Interview Summary

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

TRST Equipment Operator (TC-07) – Formal Interview

The Equipment Operator has been with WMATA for approximately 12 years, all of which time was spent as an Equipment Operator. The Equipment Operator was last recertified on 02/28/2021. The Equipment Operator has no prior safety events. The Equipment Operator currently holds an RWP Level 4 that expires on 04/30/2024.

The Equipment Operator stated they were setting up for the shutdown prior to the incident occurring. The Equipment Operator stated they were operating TC-07 at the time of the incident, without the boom crane secure. The Equipment Operator stated they were pushing a cart with TC-07 at the time, which was the reason for the boom crane being unsecured.

The Equipment Operator stated that they hit the top of the portal with the boom crane at the incident site. The Equipment Operator stated that the impact caused them to eject through the front windshield from the operator's seat.

The Equipment Operator stated they had not pushed a cart with the equipment before and were not instructed to do so. The Equipment Operator stated they pushed the cart due to it being "in the way."

The Equipment Operator stated they then contacted the MICC and were transported back to the Twinbrook Station platform, where they were then taken to Shady Grove Hospital.

The Equipment Operator stated they were post-incident tested at Shady Grove Hospital. The Equipment Operator stated they sustained head trauma and were seeking guidance from a specialist moving forward.

The Equipment Operator stated the implementation of a seatbelt would have been useful to avoid the injuries they sustained.

TRST Equipment Operator Written Statement

The Equipment Operator has been with WMATA for approximately 12 years, all of which time was spent as an Equipment Operator. The Equipment Operator was last recertified on 02/28/2021. The Equipment Operator has no prior safety events. The Equipment Operator currently holds an RWP Level 4 that expires on 04/30/2024.

The Equipment Operator stated they were operating TC07 at the time of the incident, without the boom crane secure. The Equipment Operator stated they were pushing a cart with TC07 at the time which was the reason for the boom crane being secure.

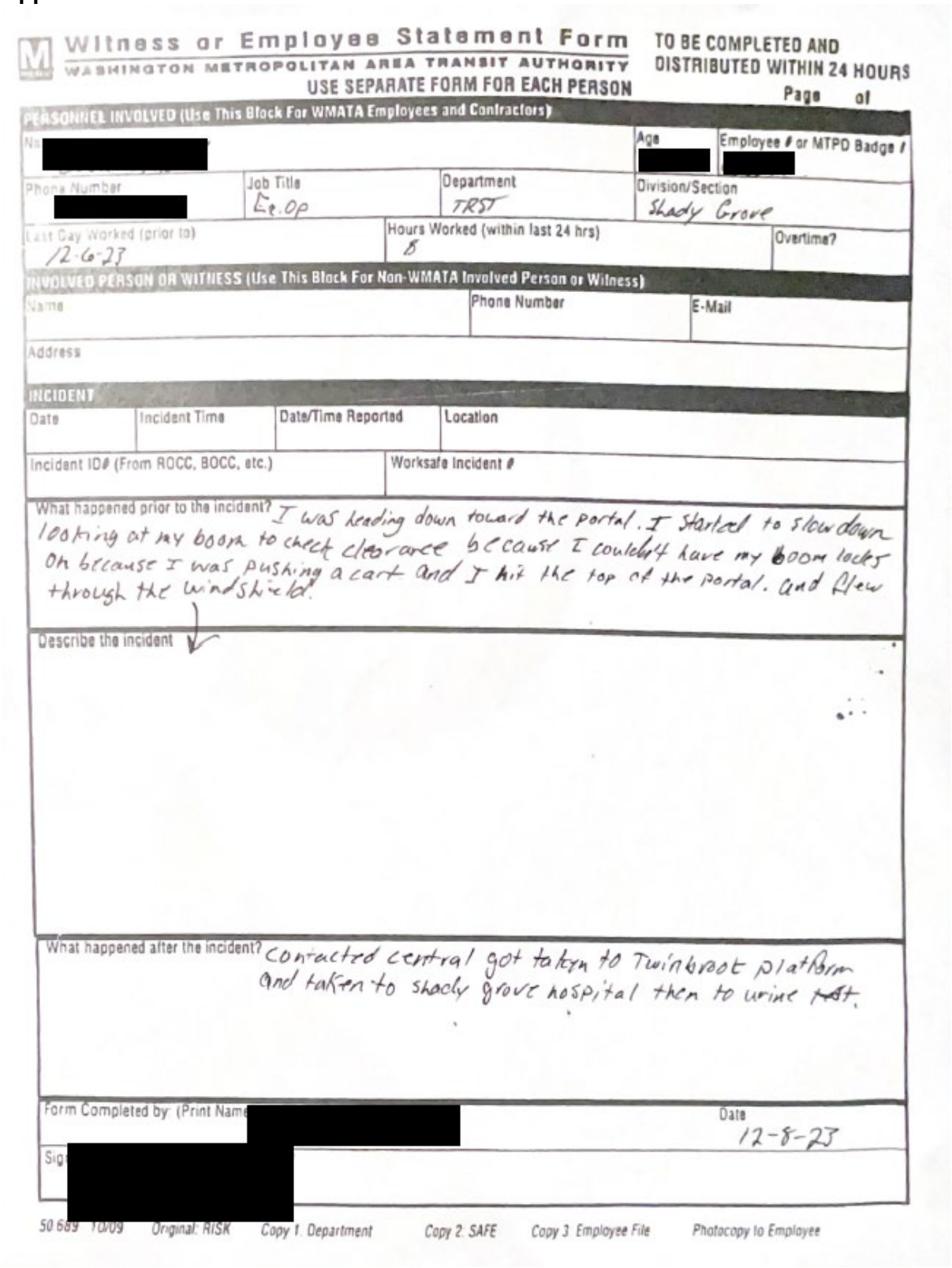
The Equipment Operator stated that they hit the top of the portal with the boom crane at the incident site. The Equipment Operator stated that the impact caused them to eject through the front windshield from the operator's seat.

Drafted By: SAFE 705 02/06/2024
Reviewed By: SAFE 704 02/06/2024
Approved By: SAFE 707 – 02/07/2024

The Equipment Operator stated they contacted the MICC and then transported back to Twinbrook Station platform limits, where they were taken to Shady Grove Hospital.

The Equipment Operator stated they were post-incident tested at Shady Grove Hospital.

Appendix B – TRST Documentation



Witness or Employee Statement Form
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY
USE SEPARATE FORM FOR EACH PERSON

TO BE COMPLETED AND DISTRIBUTED WITHIN 24 HOURS

Page of

PERSONNEL INVOLVED (Use This Block For WMATA Employees and Contractors)

Name [redacted] | Age [redacted] | Employee # or MTPD Badge # [redacted]

Phone Number [redacted] | Job Title Eq. Op | Department TRST | Division/Section Shady Grove

Last Day Worked (prior to) 12-6-23 | Hours Worked (within last 24 hrs) 8 | Overtime?

INVOLVED PERSON OR WITNESS (Use This Block For Non-WMATA Involved Person or Witness)

Name | Phone Number | E-Mail

Address

INCIDENT

Date | Incident Time | Date/Time Reported | Location

Incident ID# (From ROCC, BOCC, etc.) | Worksafe Incident #

What happened prior to the incident? I was heading down toward the portal. I started to slow down looking at my boom to check clearance because I couldn't have my boom locks on because I was pushing a cart and I hit the top of the portal. and flew through the windshield.

Describe the incident

What happened after the incident? contacted central got taken to Twinbrook platform and taken to shady grove hospital then to urine ~~test~~.

Form Completed by: (Print Name [redacted] Date 12-8-23

Sig [redacted]

50 669 10/09 Original: RISK Copy 1: Department Copy 2: SAFE Copy 3: Employee File Photocopy to Employee

Document 1 - TRST Equipment Operator's Written Statement Page 1 of 1

Appendix C – Maximo Work Order

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

Work Order #: 18292317
Type: CM

Status: INPRG
12/13/2023 09:55

Work Description: Post Incident Inspection / Repairs
Job Plan Description:

From [redacted]: TC07 Contact with tunnel entrance.

At 1:26am got a call from Ops 1, Mrs. J[redacted], saying TC07 would not move and needed assistance, Mrs. J[redacted] said operator was [redacted], I at that time called Mr.[redacted] to get more information, at that time he informed me that he had contact with the tunnel entrance, I asked him if he was ok and needed assistance, and he said no, and he had called his supervisor, at that time I called [redacted] (operators supervisor) to let him know had personal on the way, and called Ops to know CTEM was on the way
At that point I called at 2:05am
[redacted] -no answer – but did call back.
[redacted] – no answer
[redacted]
called for fowl time at 2:22am walked down to unit and inspected make sure no leaks and waited for safety.
at 2:56am called Ops 1 talked to Mrs.[redacted] to find out about safety, she transferred me Ops supervisor[redacted], who referred me to MAC. At MAC talked to Mr.[redacted] who said safety was not coming out and we could continue with removal of unit TC07.
at that time called for tow unit, while waiting on tow unit, started unit moved and made ready for its removal, moved unit to platform and got it of grade for safety.
Cleared main at 6:42am
PM46 Towed TC07 to shady grove yard Operator - Love
TC07- Operator on contact – [redacted].
TC07- Operator for removal-[redacted]
Track supervisors-[redacted]
Mechanics-[redacted]
CTEM supervisor [redacted]
Ops-[redacted]
MOC-[redacted]

Work Information

Asset:	MTC07 TC07, TIE CRANE, KNOX KERSHAW, S/N 2000-005-12	**Owning Office:**	CTEM	**Parent:**	
Asset Tag:	MTC07	**Maintenance Office:**	CTEM-BRAN-HVYR	**Create Date:**	12/13/2023 09:44
Asset S/N:	2000-005-12	**Labor Group:**	CTEM-GBLT-HVY	**Actual Start:**	12/13/2023 09:55
Location:	2279 F99, BRANCH AVENUE YARD	**Crew:**		**Actual Comp:**	
Work Location:	1136 A99, SHADY GROVE YARD	**Lead:**		**Item:**	
Failure Class:	CTEM001 GENERAL	**GL Account:**	WMATA-02-33380-50499070-041-**********-*****-OPR**		
Problem Code:	1025 ACCIDENT/COLLISION/DERAIL	**Supervisor:**	[redacted]	**Target Start:**	
Requested By:		**Requestor Phone:**	[redacted]	**Target Comp:**	
Chain Mark Start:		**Chain Mark End:**		**Scheduled Start:**	
Create-Mileage:	0.0	**Complete-Mileage:**	0.0		

Document 2 – CTEM Maximo Work Order #18292317, Page 1 of 2

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

Work Order #: 18292317
Type: CM

Status: INPRG
12/13/2023 09:55

Work Description: Post Incident Inspection / Repairs
Job Plan Description:

Task IDs

Task ID	
10	Perform Post Incident Inspection

Component: 000-400 CTEM-CAR TRACK EQUIPMENT (NON-REVENUE VEHICLES) **Work Accomp:** INSPECTED **Reason:** INCIDENT//ACCIDENT **Status:** INPRG **Position:** **Warranty?:** N

Failure Reporting

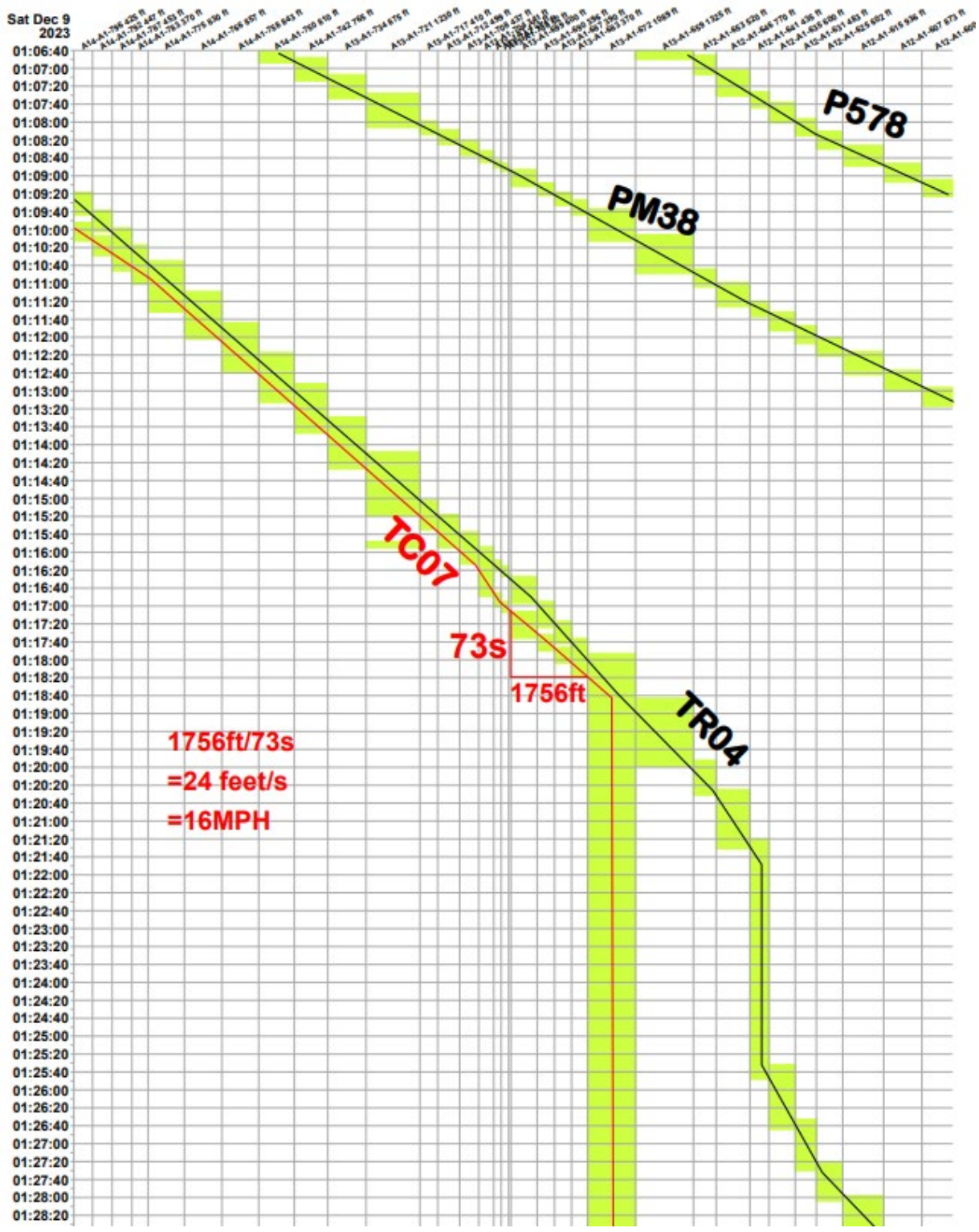
Cause		Remedy		Supervisor	Remark Date
1021	ACCIDENT HIT SOLID OBJECT	3192	TESTED / INSPECTED	[redacted]	12/13/2023

Remarks: Performed Post Incident Inspection with findings

WT_plust_woprint.rptdesign 12/25/2023 21:41

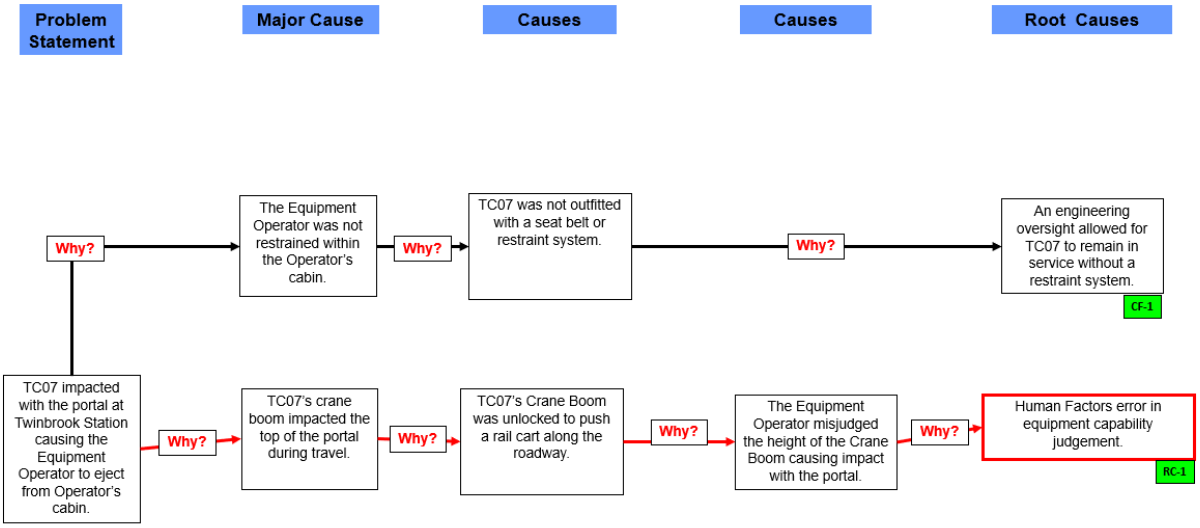
Document 3 - CTEM Maximo Work Order #18292317, Page 2 of 2

Appendix D – OSS Speed Estimate



Document 4 – OSS Speed Estimate Excerpt Page 1 of 1

Appendix E – Why-Tree Analysis



Root Cause Analysis