

WMSC Commissioner Brief: W-0051 – Serious Injury at West Falls Church Station – August 5, 2020

Prepared for Washington Metrorail Safety Commission meeting on October 20, 2020

Safety event summary:

A Metrorail contractor working on the Orange Line summer shutdown project suffered a broken leg when barriers that are typically weighed down by filling them with water fell out of lifting straps and onto the contractor's right leg.

The barriers had been double-stacked and were not completely emptied prior to lifting when the barriers should not have been stacked and had to be completely emptied to be moved in the safest possible manner.

The work crew had not properly planned for the work, and did not properly prepare the load. Although the barriers should have been lifted with a choke hitch, they were instead lifted with a basket. The crew also did not leave appropriate space for themselves so that the worker would be out of the way if the barriers fell.

Kiewit did not follow WMATA's Drug and Alcohol Policy and Testing Program Policy Instruction regarding post-incident testing, which required testing of the contractor employees such as the injured employee, foreman and others whose actions may have played a role in this event.

Probable Cause:

Metrorail did not conduct adequate oversight of contractor work plans, which allowed for inadequately planned work to proceed on WMATA property in a manner that created safety risks.

Corrective Actions:

The contracted company responsible for the work conducted a safety stand down and incorporated this information into daily safety briefings.

WMSC staff observations:

Metrorail is responsible for proper work plans across the WMATA system, and should examine steps it can take to improve the safety of contractor operations.

Metrorail's Safety Department investigation team recommends that the Safety Department's construction team conduct daily surveys of construction projects to ensure proper oversight of contractors and to verify contractor work plans.

Metrorail is also responsible for compliance with all applicable WMATA policies, including contractor compliance with Drug and Alcohol Program testing requirements.

Metrorail's Safety Department investigation team recommends that the Safety Department's construction team ensure this testing takes place.

Staff recommendation: Adopt final report.



Washington Metro Area Transit Authority

Department of Safety and Environmental

Management (SAFE)

FINAL REPORT OF INVESTIGATION A&I E20288

Date of Event:	8/05/2020
Type of Event:	Serious Injury
Incident Time:	15:58 hrs.
Location:	West Falls Church Station
Time and How received by SAFE:	16:07 hrs., On-Call Phone
WMSC Notification Time:	16:50 hrs.
Rail Vehicle:	N/A
Injuries:	Fractured Right Fibula
Damage:	None

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Abbreviations and Acronyms

ARS	Audio Recording System
ссти	Closed Circuit Television
СМ	Chain Marker
MSRPH	Metrorail Safety Rules and Procedures Handbook
МОС	Maintenance Operations Control
NOAA	National Oceanic Atmospheric Administration
OHAW	Occupational Health and Wellness
PM	Prime Mover
ROCC	Rail Operations Control Center
SAFE	Department of Safety and Environmental Management
ТВТ	Toolbox Talk
WMATA	Washington Metropolitan Area Transit Authority

Washington Metropolitan Area Transit Authority

Department of Safety & Environmental Management

Executive Summary

On Wednesday, August 05, 2020, at approximately 15:58 hrs., Contractors working on the West Fall Church Station rehabilitation project were loading a Prime Mover (PM) with partially-filled Water-filled Construction Barriers; the Barriers being lifted, shifted within the lifting straps unbalancing the load and causing it to fall off the straps and injuring a Contractor employee. A Barrier fell onto the Contractor employee's right leg injuring their ankle. The Contractor employee was transported to Virginia Hospital Center.

Based on findings, the Contractor employees were loading PM 50 with interlocking construction Water-filled Construction Barriers at Chain Marker (CM) K2 526+00, Track 2 on [outbound] the Orange Line in the direction of Vienna. The double-stacked barriers were not completely drained; while transitioning to the offloading area, the top set of barriers began to shift, pushing the lower set of barriers in the opposite direction from the rigging and onto the contractor's leg.

Following the incident, the Contractor stopped their operations and conducted a Safety Stand-down to discuss the incident details. The details of the incident were posted in their Safety Bulletin Boards and presented as part of their Daily Safety Briefings.

The probable cause of the serious injury at West Falls Church Station was inadequate planning for the work task. The load was improperly prepared, and the Contractors used a basket to move the Water-filled Construction Barriers. After an internal analysis, it was determined the proper method to move the Water-filled Barriers was a choke hitch. The foreman chose to double stack the barriers with residual water inside, which contributed to the load being unbalanced when lifting. The proper procedure should have included removing the residual water and using a single stack to ensure adequate stability was obtained when the load was being moved. Furthermore, the injured Contractor employee was positioned too close to the landing zone. Proper planning was not used to foresee the inadequacies of this work task, which resulted in the Contractor employee suffering a serious injury.

During the investigation, SAFE identified the following issues:

- (1) Residual water was left in the barriers. The barriers should have been emptied before rigging and movement occurred.
- (2) Personnel were occupying space within the landing zone of the load being moved. This area should have been clearly identified for workers present to stand clear.
- (3) Planning was inadequate for the work task as employees experienced a lack of space while moving barriers on the prime mover rail cart.

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

For Kiewit to re-train all crews involved in rigging operations with an emphasis on operations around the No Stand Zone Area. Additionally, construct detailed plans for materials types, equipment and methodologies used for each work assignment.

For SAFE Construction Officer to conduct daily surveys of constructions projects to ensure proper oversight of contractors and to verify contractor work plans.

Incident Site

West Falls Church Station, Track 2, Chain Marker K2 526+00



Field Sketch/Diagram

The above illustrates the approximate area of the rigging operations and the location where the injury occurred.

Purpose and Scope

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

Investigative Methods

The investigative methodologies included the following:

- Physical Site Assessment
- Formal Interviews One (1) Individual was interviewed as part of this investigation. Interviews included persons present at, during, and after the time of the incident, those directly involved in the response process, and managers responsible for the process. The following individuals were interviewed:

- Contractor employee
- Documentation Review Collection of relevant work history information and process documentation contained in Metro systems of records. These records include:
 - Contractor Employee Training and Certifications
 - Contractor Employee 30-Day work history
 - Foreman's Training and Certifications
 - Foreman's Employee 30-Day work history
 - Metrorail Safety Rules and Procedures Handbook (MSRPH)
 - National Oceanic Atmospheric Administration (NOAA)
- System Data Recording Review Collection of information contained in Metro Data Recording Systems. This data includes:
 - ARS playback [Radio and Phone Communications]
 - CCTV playback

Investigation

Upon receiving notification from the Rail Operations Control Center (ROCC) of the Contractor injury on the Orange Line Track 2 at Chain Marker K2 526+00 on August 5, 2020, SAFE launched a cross-functional incident investigation into the Contractor injury. Information gathered by SAFE's investigation is contained within this report.

Based on findings, the Contractor employees were loading PM 50 with partially-filled Water-filled Construction Barriers at K2 526+00 on the [outbound] Orange Line in the direction of Vienna Station. The double-stacked barriers were not completely drained; while transitioning to the offloading area, the top set of Barriers began to shift, pushing the lower set of barriers in the opposite direction from the rigging and onto the rigger's leg.

Time	Description
16:05:57 hrs.	Based on ARS, The Maintenance Operations Control (MOC) Assistant Superintendent received a report of an injured Contractor employee via landline from the Construction Inspector on scene. The Inspector stated the injury occurred at approximately 15:58:00 hrs., and the employee was injured on a railcar cart at CM K2 526+00 when a piece of equipment fell on the employee.
16:13:05 hrs.	Based on ARS, the MOC Assistant Superintendent gave additional information to the SAFE On-Call Officer of an injured Contractor employee via landline, which included how the injury occurred, location of the injury and that the employee was waiting for medics to arrive.
16:17:05 hrs.	Based on ARS, the MOC Assistant Superintendent received updated information, which included the time of injury, the type of work being

Chronological Event Timeline

performed on the rail cart which contributed to the injury, which	۱
resulted in a broken right ankle.	

Photos of Water-filled Construction Barrier



Photo 1 – Example of interlocking construction Water-filled Construction Barriers utilized



Photo 2 – Example of undrained water remaining in barrier

Date: 8/05/2020 Time: 15:58 hrs. Final Report – Serious Injury E20288

 Drafted By:
 SAFE 702 – 10/03/2020

 Reviewed By:
 SAFE 704 – 10/05/2020

 Approved By:
 SAFE 701 – 10/05/2020

 Rev.01 Approved By:
 SAFE 701 – 10/08/2020

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Immediate Mitigation to Prevent Recurrence

- The Contractor conducted a safety Stand down immediately after the incident.
- The Contractor conducted Daily Safety briefings on all shifts before work commenced.
- The Contractor's Safety Bulletin Board was updated to include the incident and prevention measures.

<u>Findings</u>

- Residual water was left in the barriers and should have been completely drained prior to movement.
- The improper tool was used to lift the Water-filled Construction Barriers. The work crew used a basket to move the barriers instead of the appropriate tool, a choke hitch.
- The No Stand Area was not clearly identified to prevent workers from entering while the load was being moved.
- Poor planning due to lack of space to move about on the PM while lifting loads. An
 adequate plan needs to be created prior to the start of work to identify and reduce
 safety hazards associated it the task at hand. In addition, construction work plans
 should be completed before work commences to mitigate any safety risks
 determined.
- Contractor Employees need to abide by the approved Occupational Health and Wellness (OHAW) Drug and Alcohol Compliance Program Post-Accident/Post-Incident Determination Referral Form that states: "Federal Transit Administration (FTA) regulations and WMATA's drug and alcohol policy require employees involved in an accident/incident to submit to testing for prohibited drugs and alcohol as soon as possible following the occurrence".

<u>Weather</u>

At the time of the incident, the temperature was 87° F, partly sunny, 46% humidity with North to North East winds up to 3 mph. Visibility was 10 miles. SAFE has concluded that weather was not a contributing factor in this incident (Weather source: NOAA – Location: West Falls Church, VA)

Human Factors

<u>Fatigue</u>

Based on SAFE's interview question related to Fatigue Factors and review of the Contractor Employee's 30-day work history, it was determined, the Contractor employee's hours of service were in accordance with WMATA's *Fatigue Risk Management Policy 10.6* and *Hours of Service Limitations for Prevention of Fatigue Policy 10.7* and discounted Fatigue as a contributing factor for this event.

Post-Incident Toxicology Testing

The Contractor company management determined this incident did not meet the criteria to conduct post-incident toxicology testing on the injured Contractor employee. Based on SAFE's investigative findings and Metro's drug and alcohol policy, the Contractor managerial staff should have removed the injured contractor employees from service for post-incident testing, given the known facts at the time of the incident. Under WMATA's current Drug and Alcohol Policy and Testing Program Policy Instruction 7.7.3/6, Post-Incident Testing may be performed on employees and Contractors whose performance cannot be "completely discounted."

Note: Kiewit management did not have drug testing records for the injured Contractor employee due to the fact the Contractor employee was transported to the hospital via EMS and was admitted. The hospital would not release any information directly to Kiewit management as those personal records are protected.

Probable Cause Statement

The probable cause of the serious injury was inadequate planning. The load was improperly prepared by not draining the residual water remaining inside the barrier. The Contractors chose the method of using a basket to move the water barriers, which, after detailed analysis, was later determined, the proper method should be to use a choke hitch. Furthermore, the foreman chose to double stack the barriers while residual water remained inside, which contributed to the load being unbalanced when lifting. Lifting with a single stack would have the lessoned the risk of the load becoming unbalanced. Additionally, the injured Contractor employee was positioned too close to the landing zone. Proper planning was not used to foresee the inadequacies of this work task, which resulted in the Contractor employee suffering a serious injury.

SAFE Recommendations

SAFE recommends:

- 1. The Contractor company re-train all crews involved in rigging operations with an emphasis on operations around the No Stand Zone Area.
- 2. The Contractor company re-train all crews involved in rigging operations with an emphasis on operations around the No Stand Zone Area.
- 3. The Contractor company constructs detailed plans for materials types, equipment and methodologies used for each rigging work assignment.
- 4. SAFE Construction to ensure that Contractor Employees abide by the approved OHAW Drug and Alcohol Compliance Program Post-Accident/Post-Incident Determination Referral Form that states: "Federal Transit Administration (FTA)

regulations and WMATA's drug and alcohol policy require employees involved in an accident/incident to submit to testing for prohibited drugs and alcohol as soon as possible following the occurrence".

5. For SAFE Construction Officer to conduct daily surveys of construction projects to ensure proper oversight of contractors and to verify contractor work plans.

Appendix A - Interview Summary

Interview Details

Contractor Employee

Based on the interview, the Contractor Employee stated the following:

The Contractor Employee has a total of fifteen (15) years of experience as an ironworker and has been with the Contractor for three (3) years. The Contractor Employee was on the current job assignment for less three (3) months. There was no history of sleep issues to report.

Based on the SAFE interview, the Contractor Employee stated the following. They were assigned to load PM 50 with Water-filled barriers. The job assignment was clear and there were no safety concerns. The area on the PM where the barriers were being placed was constricted with little to room to move about. During the barrier movement, as the load swung, the load became unbalanced and started to slip out of the sling. The Contractor crew was positioned on PM 50 very close to where to the load was being offloaded and as the barriers slipped out of the sling, they watched the load fall but was unable to move quickly enough to clear the area before the barriers landed on the Contractor Employee's leg. The Contractor Employee reported, slings were inspected daily before each use and were in good condition at the time of the incident. The Contractor Employee stated, "it was not windy, and the weather was not a factor that contributed to the incident."

Appendix B – Safety Stand Down Documents

Attachment 1 – Safety TBT – Lifting and Rigging page 1 of 2

08. Fer	11.20 eman:		BEGINS WITH ME
Print Name Print Name: Print Name:	Signature rew: Signature:		NG & RIGGING
		Hazards	Precaution
		- Indeditors	
		Damaged Rigging	INSPECT RIGGING BEFORE USE. All rigging (including shackles and hooks) shall be inspected by the handler of the rigging before each use.
		Damaged Rigging	INSPECT RIGGING BEFORE USE. All rigging (including shackles and hooks) shall be inspected by the handler of the rigging before each use. KNOW THE ANGLE OF THE RIGGING. As the rigging spreads, the tension on the choker increases, which can cause rigging failure.
		Damaged Rigging Rigging Angle Excessive Load Weight	INSPECT RIGGING BEFORE USE. All rigging (including shackles and hooks) shall be inspected by the handler of the rigging before each use. KNOW THE ANGLE OF THE RIGGING. As the rigging spreads, the tension on the choker increases, which can cause rigging failure. KNOW THE WEIGHT OF THE LOAD. All rigging has a rated capacity, DO NO exceed this capacity.
		Damaged Rigging Rigging Angle Excessive Load Weight Location of Center of Gravity	INSPECT RIGGING BEFORE USE. All rigging (including shackles and hooks) shall be inspected by the handler of the rigging before each use. KNOW THE ANGLE OF THE RIGGING. As the rigging spreads, the tension on the choker increases, which can cause rigging failure. KNOW THE WEIGHT OF THE LOAD. All rigging has a rated capacity, DO NO exceed this capacity. KNOW THE LOCATION OF CENTER OF GRAVITY. If the hook isn't directly above the load's center of gravity, the load will shift and could cause inju- or damage.

	08.18.20 Foreman:	<u>k</u> _		BEGINS WITH M
Print Name Print Name:	Signature Crew:	Choken Hitch Angle	Angle of Choke	Rated Capacity
			Over 120 90-120 60-89 30-59 0-29	100 87 74 62 49
		 What do you need to get signed be Synthetic Slin How should all loads be rigged if th Choke all load 	ofore using syn Ng PC ey don't have S eiving a load?	$\frac{1}{2} \frac{1}{2} \frac{1}$

Attachment 2 – Safety TBT – Lifting and Rigging page 2 of 2



WMATA2 Station Rehab

Rigging Plan for Synthetic Sling(s)

Project:	Superintendent:
Description of Lift:	Engineer:
Prepared By:	Foreman:
Date:	Designated Rigger:

1. Why is wire rope not being used?

2.	2. Rigging Sketch: (Use an attached drawing if necessary.)																								
																							\square		
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The material of the sling, (polyester, nylon or aramid/K-Spec[™] core yarn):_____

The type of sling, (flat web, round or Twin-Path[®]):

- The type of hitch, (vertical, choked or basket):
- 6. The product code or stock number for the sling:

 7. The rated capacity of the sling, (hitch specific):

 8. The load/force the sling will see during the lift:
- 9. The percent of capacity (Line 8 ÷ Line 7 × 100):_____%

10. Is padding and/or softeners needed (show on above sketch):

APPROVED:

Station Mgr, Gen Supt (print) or Approved Designee Date

Station Mgr, Gen Supt (sign) or Approved Designee

Date: 8/05/2020 Time: 15:58 hrs. Final Report – Serious Injury E20288

Drafted By: SAFE 702 – 10/03/2020 Reviewed By: SAFE 704 – 10/05/2020 Approved By: SAFE 701 – 10/05/2020 Rev.01 Approved By: SAFE 701 – 10/08/2020



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Safety TBT – Rigging



Choke all material and equipment that doesn't have pick points and is being hoisted above 6 ft. If basketing is the only option, then you must get a **Basket Hitch Approval** sheet signed by your Station Manager or General Supt or Approved Designee

In choke hitches, the choke point shall rest on the body of the sling. The choke hitch capacity is 75% of the vertical capacity as long as the choke angle is greater than 120°. If the choke angle is less than 120°, the capacity shall be reduced in

accordance with table on the back page.

Synthetic Slings – If being used must have a **Rigging Plan for Synthetic Slings** completed and signed by Station Manager, General Supt or their Approved Designee





SAFE

Use <u>softners</u> on sharp edges that could cut the slings.

Safety – Nobody Gets Hurt