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WMSC Commissioner Brief: W-0191 – Serious Injury – Largo Town Center Station – July 28, 2022

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

Safety event summary:

On Thursday, July 28, 2022, at approximately 12:20 p.m., an Office of Elevator and Escalator (ELES) Technician's right middle finger was partially amputated as they reinstalled a metal landing plate on an escalator at Largo Town Center (now called Downtown Largo) Station.

The Technician was working alone. In an investigative interview, they stated they were rushing through work on this escalator to ensure that they would have time to address a second, separate assignment they were given for their shift. When the event occurred, the Technician was finishing an assignment to replace one step on an escalator at the station's entrance, which required the two landing plates to be removed. The Technician stated they did not have a special L-shaped tool that is used to remove and replace landing plates more safely. When returning the landing plates after replacing the step, the second plate fell into a hole as the Technician was holding it, and the Technician's finger was sheared.

The Technician contacted an ELES Assistant Superintendent on a WMATA-issued cell phone. ELES Technicians are not generally issued radios. The ELES Assistant Superintendent instructed an ELES Supervisor to respond to the station. The Supervisor arrived approximately 10 minutes later. The Supervisor assisted the injured employee to a nearby hospital to be treated.

At approximately 12:48 p.m., the ELES Supervisor returned to the station and CCTV footage appears to show the ELES supervisor instructing an ELES Apprentice to place the escalator out of service.

At approximately 2:34 p.m., over two hours after the event occurred, the ELES Supervisor contacted the ELES Operations Center to report the injury. This is a separate call center that dispatches and receives information from ELES personnel that is not part of the Maintenance Operations Center (MOC) in the Rail Operations Control Center (ROCC).

The event was not reported by the ELES Assistant Superintendent or ELES Supervisor to the Mission Assurance Coordinator (MAC) in the ROCC until approximately 5:35 p.m., nearly six hours after it occurred. The event does not appear to have been reported to any other ROCC personnel such as the Operations Manager, Assistant Operations Manager, Rail Traffic Controller or Rail Operations Information Center Information Controller. The ELES Supervisor indicated it was their first time responding to a safety event and they were unfamiliar with reporting procedures.

Metrorail did not report this accident-level event involving a partial amputation to the WMSC and FTA within two hours as required. The Maryland Occupational Safety and Health office was notified of the partial amputation injury the following day (July 29, 2022).

The ELES Technician did not undergo post-event toxicology testing. The ELES Supervisor stated they did not have the necessary form and had not completed one in a while.

Probable Cause:

The probable cause of this event was the pressure to perform several tasks alone within time constraints that caused the employee to feel rushed, and Metrorail allowing work to be conducted without the required tools and work instructions to complete the task safely. Additionally, a lack of training, experience and supervisory oversight led to the event not being reported in a timely manner, post-event toxicology testing not being conducted, and insufficient communication among Metrorail supervisors, managers, and operations centers.

Corrective Actions:

WMATA conducted Pinch Points & Hand Injuries Prevention Toolbox Talks with ELES personnel.

WMATA will review the current process for communicating injuries and/or emergencies on WMATA issued communication devices.

WMATA will review whether there is industry guidance on the need to develop a work instruction, training, or bulletin to address how to properly remove and reinstall landing plates.

ELES Operation Center (EOC) will streamline communication regarding injuries and/or emergencies with the ROCC.

WMSC staff observations:

During the WMSC's Audit of Station Maintenance, Elevators and Escalators, published in May 2022, ELES personnel expressed concern that WMATA's work alone policy allows for working conditions that are not safe, due to work that is more safely conducted with a second person being assigned to a single person. The audit also found that Metrorail has not reviewed its ELES standard operating procedures on a regular basis as required by WMATA policy and has conflicting procedures for elevator and escalator employees. Two conflicting versions of the work alone policy were in use at the time of the audit. This was also identified by QICO in a 2018 review, prior to the WMSC assuming direct safety oversight of Metrorail, which resulted in internal corrective action plans (iCAPAs) that were due to be completed in 2019. This included conflicts between 212-SOP-35 and other policies including the separate SOP 212-22 Work Alone Policy, and other SOPs that had the same titles but different information. As a result of this finding, Metrorail reviewed and will update all ELES procedures as required by WMATA policies. This work has an estimated completion date of April 28, 2023. Metrorail must implement a log and/or other system to ensure that each procedure is reviewed as required in the future. This log/system is scheduled to be completed by May 26, 2023.

The WMSC's 2021 Fitness for Duty Audit found that WMATA does not have procedures to confirm that employees are consistently removed from service for positive drug and alcohol test results in a timely manner as required by federal regulations. To address this deficiency Metrorail is required to set a maximum timeframe to verify and document positive tests, and to document removal from service, that provides for the safety of employees, contractors, customers and first responders. The corrective action plan created to address this finding is scheduled for completion on December 30, 2022.

Metrorail did not notify the WMSC and FTA within the required two-hour window. It is imperative that WMATA adequately train personnel to ensure compliance with reporting procedures for internal response, the WMSC Program Standard, and federal regulation.

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

FINAL REPORT OF INVESTIGATION A&I E22446

Date of Event:	7/28/2022
Type of Event:	A-2: Serious Injury
Incident Time:	12:20 hours
Location:	Largo Town Center Station- Escalator #4
Time and How received by SAFE:	17:35 hours Mission Assurance Coordinator (MAC) Desk
WMSC Notification Time:	18:07 hours
Responding Safety Officers:	WMATA SAFE: No WMSC: No Other: N/A
Rail Vehicle:	N/A
Injuries:	Right middle finger partial amputation
Damage:	None
SMS Number	20220729#101849

July 28, 2022
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Abbreviations and Acronyms

ARS	Audio Recording System
CAP	Corrective Action Plan
CCTV	Closed-Circuit Television
ELES	Office of Elevators and Escalators
MAC	Mission Assurance Coordinator
MSRPH	Metrorail Safety Rules and Procedures Handbook
NOAA	National Oceanic and Atmospheric Administration
OSHA	Occupational Safety and Health Administration
PPE	Personal Protection Equipment
RTRA	Office of Rail Transportation
ROCC	Rail Operations Control Center
SAFE	Department of Safety
SMS	Safety Measurement System
SOP	Standard Operating Procedure
WMATA	Washington Metropolitan Area Transit Authority
WMSC	Washington Metrorail Safety Commission

Executive Summary

On Tuesday, July 28, 2022, at approximately 17:35 hours, the Mission Assurance Coordinator (MAC) received a call from an Office of Elevators and Escalators (ELES) Supervisor to report an employee injury. The supervisor reported that the injury occurred at Largo Town Center Station at approximately 12:20 hours. The ELES Supervisor informed the MAC that an ELES Technician partially amputated their right middle finger while reinstalling a landing plate on escalator #4. The ELES Supervisor transported the ELES Technician to the University of Maryland Capitol Region Medical Center for treatment. The ELES Technician's assignment at Largo Town Center Station was to repair a key switch and replace one step on escalator #4. The ELES Technician was working alone at the time of the incident.

Per the Occupational Safety and Health Administration (OSHA), any amputation injury is classified as Serious and requires notification to OSHA or an associated state-level agency within 24 hours. In this event, the Maryland Occupational Safety and Health (MOSH) office was notified of the event at approximately 10:31 hours on July 29, 2022. As of September 28, 2022, WMATA has not received any citation related to this event.

During their interview, the injured employee reported working quickly to be able to complete both of their assigned job tasks for the day. This was the first of their two assignments. They also reported not having a special tool that can be used to replace the landing plate in a more ergonomic method.

The probable cause of the Serious Injury ~~e~~vent was a human factors error (rushing). A contributing factor to the injury was the lack of a proper tool to lower the landing plate, which would have prevented the employee's hands from being within a pinch point. The ELES Technician reported a time constraint pressure to complete the assignment so they could respond to their second assignment before their shift ended. The ELES technician also reported years ago an L-shaped tool was issued that assisted with removing and re-installing landing plates to avoid injuries like the one sustained; however, they were not issued the tool.

Incident Site

Largo Town Center Station, Escalator #4

Field Sketch/Schematics

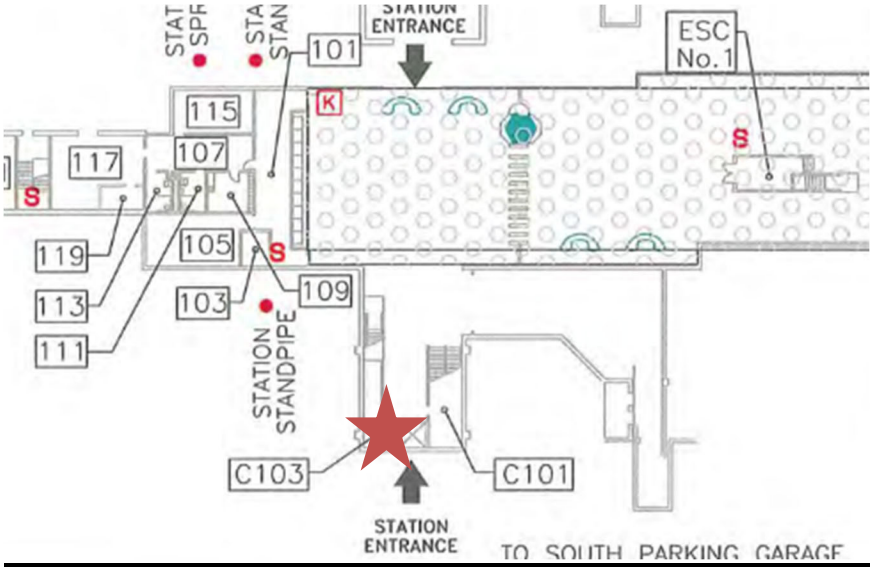


Figure 1: Depicts the ELES Technician's approximate location when they injured their finger.

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:

- Site Assessment through document review.

- Formal Interview – SAFE interviewed one (1) individual as part of this investigation, including the following:
  - Escalator Technician

- Informal Interviews – Collected through conversations with individuals during the investigation to provide background and supporting information.
  - ELES Supervisor

- Documentation Review – A collection of relevant work history information and process documentation contained in Metro systems of record. These records include:
  - Escalator Technician Training Procedures & Records
  - Escalator Technician 30 Work History
  - Metrorail Safety Rules and Procedures Handbook (MSRPH)
  - National Oceanic and Atmospheric Administration (NOAA) Data
  - Certifications

- System Data Recording Review – A collection of information contained in Metro Data Recording Systems. This data includes:
  - Audio Recording System (ARS) playback includes Phones
  - Closed Circuit Television (CCTV)

Investigation

On Tuesday, July 28, 2022, at approximately 14:34 hours, an ELES Supervisor contacted the ELES Emergency Operation Center (EOC) to report an employee injury. At approximately 14:38 hours, the ELES Emergency Response sent an email providing the basic details of the incident. The ELES Technician had two assignments to complete prior to the end of their shift. The first assignment was repairing a key switch and replacing one step on escalator # 4 at Largo Town Center Station. The second assignment was to travel to Good Luck Road to replace a battery. The ELES Technician described the incident: “I had finished putting the step in at the top of the escalator, and to do that; you must remove two-floor plates. When you enter or exit an escalator, there's normally an area with antiskid material. Those are called landing plates. You must remove the landing plates to gain access to the steps. I had removed them, replaced the step, pulled one of the floor plates into the area where it belongs, and then pit. I pulled the floor plate into position, grabbed the second floorplate, and pulled it into position, and it fell into the hole with my finger on the backside of the plate and just sheared the end of my finger off.” The ELES Technician was completing this assignment alone.

After the injury, at approximately 12:20 hours, the ELES Technician contacted their immediate supervisor, the ELES Assistant Superintendent, on an unrecorded WMATA-issued communication device, which precluded a review of the call. The ELES Technicians do not generally carry handheld radios unless there is an event. The ELES Assistant Superintendent contacted an ELES Supervisor to go to the scene. The ELES Supervisor mentioned arriving at Largo Town Center Station took approximately ten minutes. When they arrived, they immediately took the ELES Technician to the University of Maryland Capitol Region Medical Center for treatment. The ELES Technician was not referred for a post-incident drug and alcohol test. The ELES Supervisor mentioned they did not have the paperwork, and it has been a while since they had to complete a post-incident drug and alcohol form. The escalator was not immediately placed out of service. At approximately 12:48 hours, closed circuit television (CCTV) captured the ELES Supervisor’s return to the station and appeared to instruct an ELES Apprentice to place the escalator out of service.

At approximately 17:35 hours, the MAC received a call from the ELES Supervisor to report the employee injury at Largo Town Center Station. The ELES Supervisor informed the MAC an ELES Technician partially amputated their right middle finger while re-installing a landing plate on escalator #4. There was approximately a five-hour gap from when the ELES Technician was injured until the ELES Supervisor reported the incident to the MAC. During the investigation, the ELES Supervisor mentioned it was a delay on their part because they were not familiar with the reporting procedures. This was the first time that they had to report a safety event.

A Senior Safety Investigator reported the Serious Injury event to MOSH by telephone at approximately 10:31 hours on July 29, 2022, within the 24-hour window for reporting.

Chronological ARS Timeline

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

Time	Description
12:20 hours	ELES Technician suffers a hand injury while reinstalling a landing plate on escalator #4 at Largo Town Center Station. [Incident Report]
12:48 hours	ELES Supervisor returns to Largo Town Center Station to tag the escalator out of service. [CCTV]
14:34 hours	ELES Supervisor: Contacted the EOC Desk to report that an ELES Technician had their finger cut between the landing plate and escalator pit. The ELES Supervisor advised the EOC Desk to get an email out and include ELES Inspection, so they were aware. [Phone]
14:42 hours	EOC Desk: Contacted the Largo Town Center Station Manager to inform them that Escalator #4 was taken out of service due to an incident. They provided the ticket number to the Station Manager. [Phone]
17:35 hours	ELES Supervisor: Contacted the MAC Desk to report that an ELES Technician was injured while working in an escalator floor pit at Largo Town Center Station. The ELES Supervisor stated this was the first time the incident was reported, and it happened around 12:20 hours. The ELES Supervisor informed the MAC that the technician injured their right hand's middle finger and was transported to the local hospital. [Phone]

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

Interview Findings

ELES Technician

During the interview, the ELES Technician was open about what happened on July 28, 2022. The ELES Technician was working alone and had two work assignments. The ELES Technician attempted to complete their first assignment at Largo Town Center Station before heading to Good Luck Road for the second assignment. The ELES Technician was repairing a key switch and replacing one step on escalator #4. The ELES Technician reported moving too fast trying to complete their assignment due to time constraints and having to replace a battery for the second assignment. The ELES Technician mentioned there used to be a "L" shaped bar that was used to remove and re-install the landing plates. Safety briefings occur once a week during toolbox talks.

Weather

On July 28, 2022, at the time of the incident, NOAA recorded the temperature as 83° F, with cloudy skies throughout the morning. The weather was not a contributing factor in this incident (Weather source: NOAA) – Location: Washington, DC.)

Human Factors

Fatigue

Signs and Symptoms of Fatigue

SAFE evaluated conditions at the time of the incident to distinguish whether evidence of fatigue was present. No video of the person involved was available to ascertain whether evidence of fatigue was present. The ELES Technician reported feeling fully alert at the time of the incident. The ELES Technician reported experiencing no symptoms of fatigue in the time leading up to the incident.

Fatigue Risk

SAFE evaluated incident data for fatigue risk factors. No significant risk was identified. The incident time of day did not suggest an increased risk of fatigue-related impairment. The ELES Technician reported keeping a regular sleep schedule in the days leading up to the incident. The ELES Technician worked day shift in the days leading up to the incident. The ELES Technician was awake for 7.33 hours at the time of the incident. The ELES Technician reported 8 hours of sleep in the 24 hours preceding the incident. The off-duty period was 15.5 hours providing an opportunity for 7-9 hours of sleep. This was a comparable amount of time for sleep as the ELES Technician 's usual workday sleep durations. The ELES Technician reported no issues with sleep.

Post-Incident Toxicology Testing

The ELES Technician was not required to complete post-incident toxicology testing for this event.

Findings

- The ELES Technician partially amputated their right middle finger reinstalling a landing plate.
- The ELES Technician reported that they were rushing to complete the assignment and did not have a special “L” shaped tool so they could ergonomically reinstall the landing plate and minimize interaction with pinch points.
- There is no training or SOP on how to properly remove and reinstall landing plates. It is considered a normal part of operations.
- The serious injury was reported to the ROCC several hours after the fact.
- The ELES Supervisor was not familiar with injury reporting procedures.

Immediate Mitigation to Prevent Recurrence

- The ELES Technician was transported to the hospital.
- Escalator #4 was placed out of service.
- Pinch Points Safety Talk developed and distributed.

Probable Cause Statement

The probable cause of the Serious Injury event was a human factors error (rushing). A contributing factor to the injury was the lack of a proper tool to lower the landing plate, which would have prevented the employee's hands from being within a pinch point. The ELES Technician reported a time constraint pressure to complete the assignment so they could respond to their second assignment before their shift ended. The ELES technician also reported years ago an L-shaped tool was issued that assisted with removing and re-installing landing plates to avoid injuries like the one sustained; however, they were not issued the tool.

SAFE Recommendations/Corrective Actions

Corrective Action Code	Description	Responsible Party	Estimated Completion Date
101849_SAFECAPS_ELES_01	Pinch Points & Hand Injuries Prevention Toolbox Talk	ELES	Completed
101849_SAFECAPS_ELES_02	Conduct a campaign and make sure all ELES mechanics have the "L" shaped tool	ELES	11/30/2022
101849_SAFECAPS_ELES_03	ELES will review the current process for communicating injuries and/or emergencies on WMATA issued communication devices.	ELES	12/31/2022
101849_SAFECAPS_ELES_04	ELES EOC will streamline communication regarding injuries and/or emergencies with the ROCC.	ELES	04/01/2023
101849_SAFECAPS_ELES_05	ELES will review whether there is industry guidance on the need to develop a Work Instruction, training, or bulletin to address how to properly remove and reinstall landing plates.	ELES	12/31/2022

Appendices

Appendix A – Interview Summary

**The transcript below summarizes the SAFE interview conducted with the ELES Technician. It reflects their statements and may conflict with other systems of record.*

The ELES Technician is a WMATA employee with eleven (11) years of service and six (6) years as an ELES Technician. The ELES Technician previously worked as an ELES Journeyman, ELES Apprentice, and General Equipment Mechanic. The ELES Technician is RWP Level 1 certified. There is no recertification process for ELES Technicians. The ELES Technician mentioned feeling fully alert right before the incident. The ELES Technician mentioned their coverage area includes the East and North side of the WMATA system. The ELES Technician mentioned it was a normal workday, and one of their assignments was at Largo Town Center Station to conduct safety work. The safety work included repairing a key switch and replacing one step. The ELES Technician was completing this assignment alone.

The ELES Technician mentioned that the ELES Supervisor conducts a safety briefing once a week, which part of the toolbox talks. The ELES Technician mentioned the only PPE required to complete their assignment was safety shoes and safety glasses. The ELES Technician described the incident as follows: "I had finished putting the step in at the top of the escalator, and to do that, you have to remove two-floor plates. You know when you enter or exit an escalator, there's normally an area that has antiskid material on it. Those are called landing plates. You must remove the landing plates to gain access to the steps. I removed them, replaced the step, pulled one of the floor plates into the area where it belongs, and then exited the pit. I pulled the floor plate into position, then grabbed the second floor plate and pulled it into position, and it fell into the hole with my finger on the backside of the plate and just sheared the end of my finger off."

The ELES Technician mentioned the landing plates typically do not go into the grooves easily, so they use a prybar or something to help. The ELES Technician mentioned they used to have an L-shaped tool that helped remove and re-install the landing plates. The ELES Technician called the ELES Assistant Superintendent via cellphone to report their injury. The ELES Technicians would not carry radios unless there was a special event or emergency. The Assistant Superintendent instructed an ELES Supervisor to report to Largo Town Center Station. The ELES Supervisor transported the injured technician to the University of Maryland Capitol Region Medical Center. When the ELES Technician was asked if they could have done something differently to prevent the injury, they stated, "I should have stood up and picked the plate up and walked it into position and put a screwdriver under it or something like that to prevent it from fully engaging into the area where it belongs, but I was thinking about putting that battery in and running out of time and all that stuff." The ELES Technician sustained an injury to their right middle finger.

Appendix B – “L” Shaped Tool

Figure 2 - L-Shaped tool used to lift and lower landing plates

Appendix B – Pinch Points Safety Talk Corrective Action

Washington Metropolitan Area Transit Authority

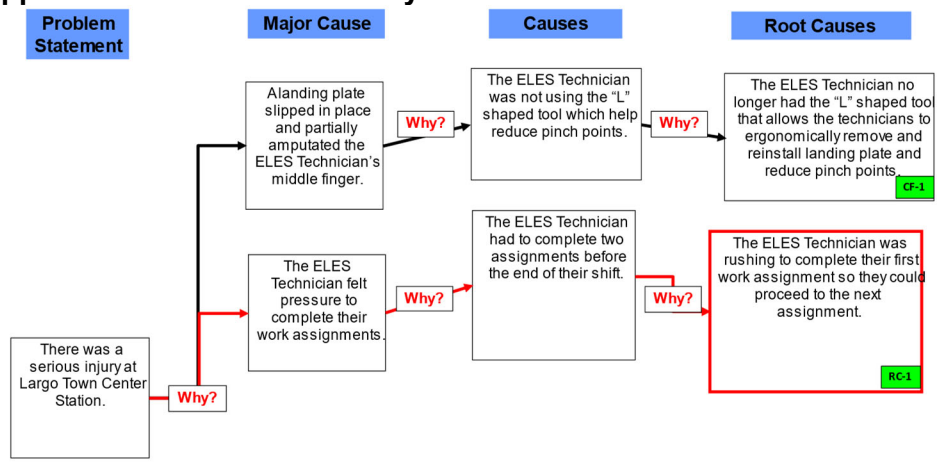
Incident Number
20220729#101849

CORRECTIVE ACTIONS

Pinch Points Safety Talk

Incident	20220729#101849
Priority	(2) Normal
Status	In Progress
% Complete	10
Action Owner	[redacted]
Start Date	08/01/2022
Management System	Communication
Corrective Action Title	Pinch Points Safety Talk
Corrective Action(s)	Hand injuries are the second leading type of injury on the job site in the United States. This is mostly due to the fact that we use our hands for virtually all work tasks and they are constantly in the line of fire. A major type of injury that can occur to the fingers and the hands-on job site are from crushed-by type accidents. Pinch points are a hazard that can lead to crushed-by injuries. An injury from a pinch point can be simple and minor or can be more complex and life-threatening. Some minor pinch point injuries include blisters and contusions. While more complex and severe injuries include amputation and even death. Other examples of pinch point injuries that can occur include bruising, cuts, sprains, lacerations, and crushing of the hand or finger. Should you find yourself suffering from a pinch point injury you should report your injury to foreman or supervisor immediately. If necessary you should seek medical treatments for your injury. If needed you can call 911 or have a coworker do it for you. With many injuries, time is of the essence so that a proper diagnosis and treatment can be identified.
Target Date	08/01/2022
CAP Closure Category	In Progress

Appendix C - Root Cause Analysis



Root Cause Analysis