

Incident Communication

Incident Date: 11/15/2013

Officers & Directors:

This is the communication from the incident analysis of the Apprentice Electrician who seriously injured a leg when it became trapped under the Spaulding tram during operation. The incident analysis is complete and we are communicating our conclusions, along with recommended corrective actions to ensure this type of incident doesn't occur again. Please share this information with your employees.

Incident Summary:

On Friday, November 15, 2013, at approximately 4:15 p.m., a Hydro GC apprentice electrician was injured while departing the Spaulding #1 Powerhouse. The incident occurred while the employee was riding on the tram from the powerhouse up to the parking lot. The employee was positioned on the uphill edge of the tram sitting on the tram decking. After traveling approximately 90 feet uphill, the employee lost control of his hard hat, which fell off the tram making contact with the tram rail support structure. The employee, in the act of attempting to retrieve his hard hat, shifted his body position. This action caused his right leg to be positioned under the moving tram in order to bend over and reach the hard hat. This maneuver resulted in his right foot becoming entangled with a cross tie and injuring his lower leg.

What Happened:

On November 15th, the injured employee was part of a General Construction (GC) crew to support the GC work at the planned Spaulding 1& 2 Powerhouse Annual Outage Project.

While loading the tram in preparation to leave the work site the remaining open seat on the downhill bench was restricted due to the amount of equipment and trash that was loaded at the forward end of the tram. The employee made the decision to not sit on the bench due to insufficient room and chose to sit on the tram deck facing uphill.

The employee was positioned with his left leg bent under him and his right leg bent vertically so that his right foot was flat on the tram decking. After traveling approximately 90 feet, the employee's hard hat fell. He instinctively attempted to reach it. This required him to unfold his right leg and position it under the tram to act as a counterbalance.

He retrieved the hard hat and, while in the process of returning to the upright position, his right foot made contact with a crosstie. The forward movement of the tram pulled and rotated his foot twisting it inward.

911 was called and the other employees provided first aid until the ambulance arrived and the employee was taken to the Hospital where he was diagnosed and treated for multiple fractures to his lower right leg.

During the response to the injury, all of the employees were engaged in doing what they could to help. They pulled together working with the challenging location relying on their knowledge of first aid and emergency response procedures. They used all of the resources available while working as a cohesive team to provide the best possible care for their co-worker in communications with the first responders (EMT's). Specific details include:

- They immediately activated the emergency response plan by calling the DRUM Switching Center who then effectively coordinated the 911 response.
- They used several methods (cell phone, tram horn) to alert the crew foreman who was in the powerhouse at the time.
- They listened to the employee and stabilized the limb in the most comfortable position.
- Once at the top, one employee drove out to the highway to meet and lead the EMT's into the site.

- They were resourceful in obtaining ice from lunch coolers for swelling and locating materials to build a bridge to rest the injured leg.
- They all contributed their coats to keep him warm and limit the effects of shock.
- They kept him engaged in conversation to help distract from the pain.
- They were in contact with the EMT's, providing updates and following their instructions.
- They continually reassessed his condition and were thinking about next steps.

The employee has since returned to work and is expected to make a full recovery.

What Went Wrong?

There was a failure to provide detailed procedures and training for the operation and safe carriage of passengers on the tram. This resulted in the establishment of acceptable local practices that permitted passengers unrestricted seating on the tram.

Other Contributing Causes

- The operating procedure for the Spaulding tram, that was in effect at the time of the incident, failed to provide guidance in the following areas:
 - It did not restrict tram passenger seating to only the installed benches and did not require passengers to only sit in the downhill direction
 - There were no cautions or warnings to alert passengers of the risks associated with placing hands or feet beyond the confines of the tram.
 - It did not contain cautions or warnings related to, nor did it specifically prohibit the retrieval of dropped objects from the tram.
- The training provided to operate the tram was based upon the operating instructions and therefore did not contain instructions on correct passenger seating and did not provide warnings and or cautions associated with keeping hands and feet inside the tram.
- The training for operating/riding the tram is not defined in a structured format to ensure that all aspects (operation, safety, emergency) related to the tram are fully addressed to ensure consistency and currency of training for all individuals who operate or ride the tram.
- The tram had no placarded cautions or warnings to alert and remind passengers of the hazards associated with riding the tram.
- The tram has no defined cargo area that would ensure adequate seating room and a clear path for safe ingress/egress of passengers on the downhill bench.
- The employee made a decision to sit on the uphill section of the tram and not on a bench due to overcrowding on the downhill bench seat resulting from equipment and trash bags that were loaded as cargo.
- The employee, in a spontaneous reaction to a dropped hard hat, positioned his right leg under the tram while it was in uphill operation in an effort to retrieve the hard hat.

Other Findings

- There were informal tailboards being performed that covered not only operational procedures, but addressed tram safety such as: not retrieving dropped objects, sudden stops and slip and trip hazards.
- All of the employees riding the tram had a strong belief and placed great importance on looking out for each other.

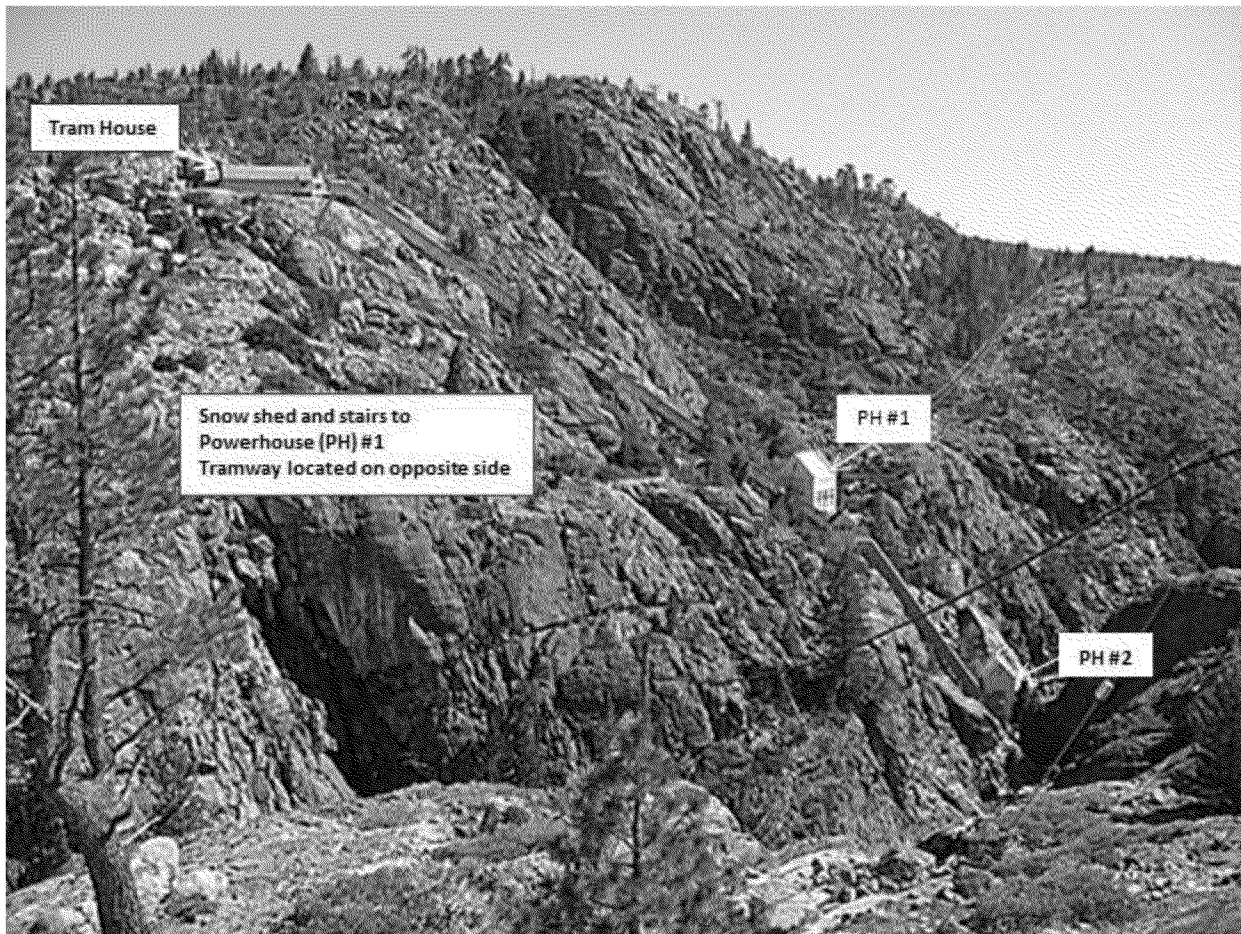
Lessons Learned

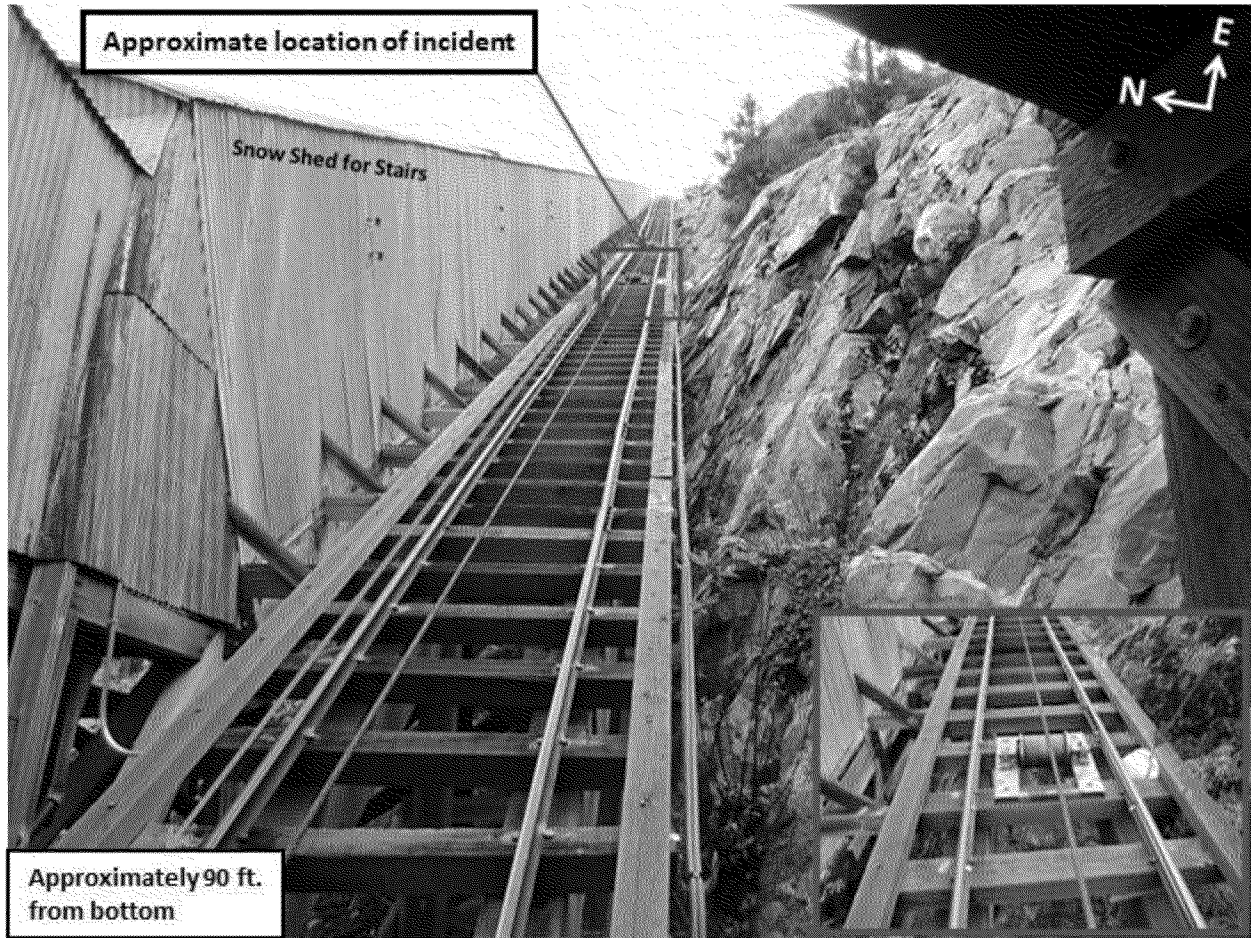
- Always have a questioning attitude. We must not let our guard down or get complacent during easy or routine tasks.
- We must look out for our co-workers, not only during the work day, but after work as well. We want everyone to go home safely every day.
- We must identify and eliminate hazards through daily JSAs
- Situational Awareness applies to everyone at all times.

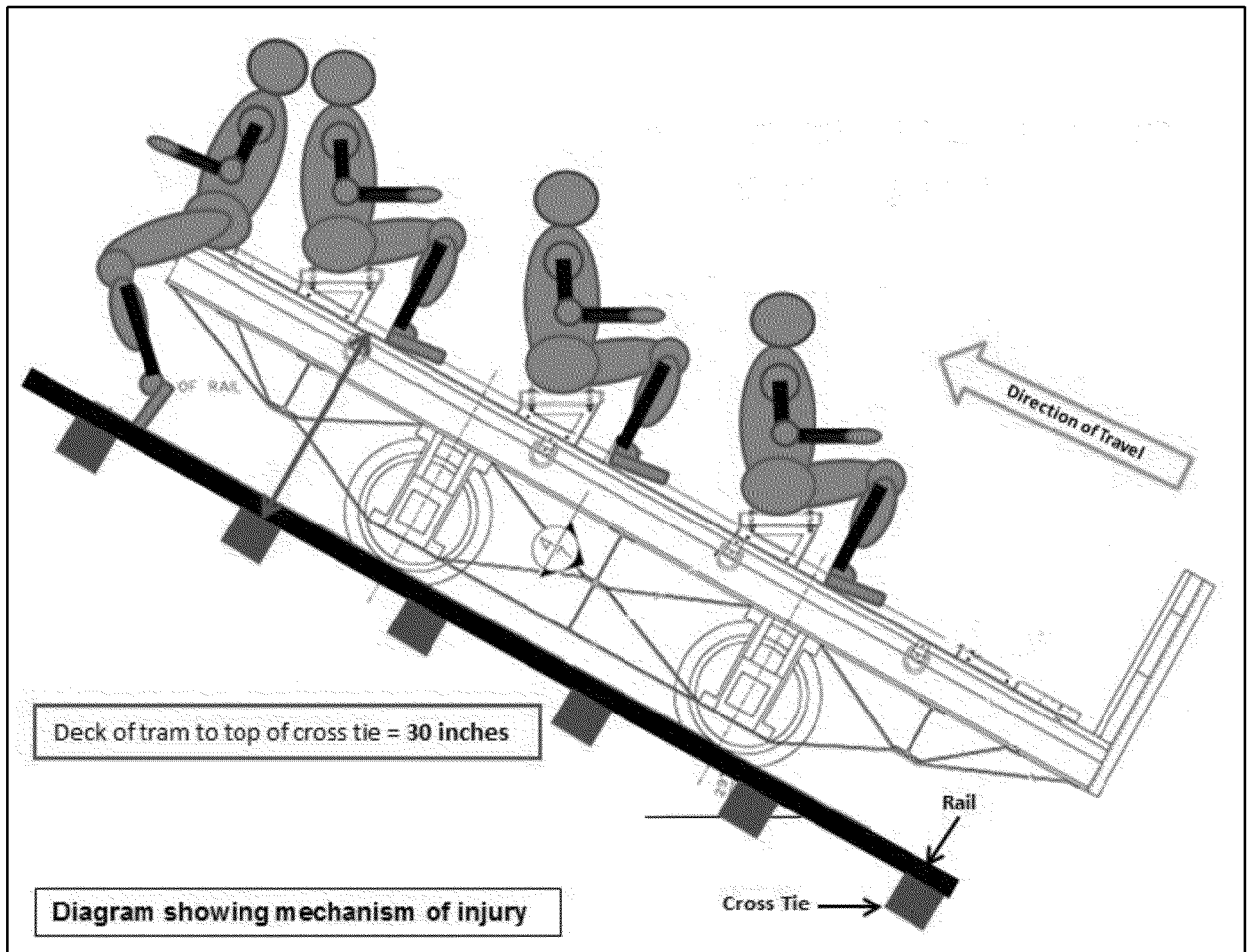
Recommended Corrective Actions:

- Revise the Utility Procedure for the Spaulding tram to ensure that, in addition to tram operation, it addresses the following areas: passenger loading, seating configuration, fall protection/restraint, training/qualification, snow removal, dropped objects, operator responsibility and emergency procedures.
- Install a caution placard on the tram that is in full view of all passengers and that addresses: Passenger seating configuration, hand and feet restrictions, cargo security and dropped objects. The caution sign must be created in accordance with the company standard drawing 054032 for caution signs.
- Complete and document a full Job Hazard Analysis of the Spaulding tram to identify unmitigated hazards that is reviewed and approved by the Manager of Safety Compliance and Auditing.
- Update tram drawing 393224 to reflect the installation of the loading and caution placards to ensure they are maintained on the tram.
- Create a defined area on the tram for small cargo that will ensure unrestricted access and egress from all seating positions on the tram when used to carry passengers and ensure that tram drawing 393224 is updated to reflect the defined area.
- The tram lacks a guard rail for fall protection/restraint. Install a guard rail on the tram to cover the 3 open sides to include a positive locking access gate to ensure guard rail integrity.
- Ensure that appropriate fall protection/restraint devices are provided and utilized to provide protection of employees when outside the confines of the tram in accordance with the Fall Protection Standard SAFE-1012S
- Devise a method for all tram passengers to safely egress from the tram should it become inoperative at any point between the upper and lower landing that meets the requirements of Fall Protection Standard SAFE-1012S
- Create an Emergency Response Plan for the Spaulding Tram that addresses actions required for emergencies that include but are not limited to: emergency egress, external rescue and injuries.
- Create a tail board that must be briefed and signed by passengers riding on the tram who are not documented as qualified operator

This review and communication of findings will be tracked through the Corrective Action Program.







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