July 31, 2014

**James T. Cheung**
**Safety and Enforcement Division**
**California Public Utilities Commission**

Mr. Cheung:

We are in receipt of your letter and request for additional data from June 27, 2014. Thank you for meeting with the team last month. We truly appreciate your feedback and ongoing guidance on this issue. We are working hard to incorporate all of your feedback and to ensure the ongoing safety of our employees and contractors that work in the area. We have compiled an updated action plan that addresses the remaining open items as discussed during the meeting on June 24, 2014.

## Spaulding Tram Action Plan Update as of July 31, 2014

***CPUC Open Item #7:*** *Tram Operators are not required to document daily equipment inspections. A written Component shall be part of the Tram Operating procedures and retained for five years.*

**PG&E Response:**
Spaulding Tram Operating Procedure PG-3514P-01 will be revised to include a requirement for the Operator to document their daily equipment inspection on the tailboard form. This additional documentation will be in the form of a checklist to include: the date, the Operator's name and LANID and if discrepancies were noted or not in addition to the items required as part of the procedure. If noted, the discrepancies will be entered into the SAP program for maintenance action.
***Corrective Action Date: 12/31/2014***

***CPUC Open Item #8:*** *Management was ignoring and tolerating employee behavior leading to complacency and the acceptance of unsafe working conditions. Management will evaluate other long standing practices, solicit and listen to employee verbal messaging and make changes accordingly*

**PG&E Response:**
A comprehensive communication package will be developed to be presented to all affected Power Generation employees detailing the following:

1. Incident Summary to frame the dialogue regarding open communication of safety issues
2. Provide a detailed list of the corrective actions accomplished and planned
3. Engage the employees in a proactive discussion surrounding the need to raise issues, the company's desire for this and the multiple paths that issues can be brought forth and addressed.

***Corrective Action Date: 10/01/2014***

***CPUC Open Item #13:*** *Annual Fire Drills have not been performed for the facility*

**PG&E Response:**
This is not a staffed facility and as such does not have regular full time employees. However, there are typically 2 annual planned outage periods that entail a staffed presence for the duration of the outage. Prior to an outage, there is an extensive planning period which includes the development and review of an emergency response plan. A fire drill review and walkthrough will be added to the outage planning process.
***Corrective Action Date: 09/01/2014***

***CPUC Open Item #14:*** *There are no "Tram" specific emergency rescue procedures*

**PG&E Response:**
PG&E is taking the necessary actions to ensure the tram reliability is maintained at the highest level as possible, which includes but is not limited to the robust mechanical integrity of the existing winch unit, increased inspection and maintenance activity and the addition of an alternate power source. In the rare event whereas the tram may become inoperative before reaching a loading platform, two plans are being developed (detailed below). Both proposed plans have been reviewed with Cal Fire personnel.

**Plan 1 – Evacuation Plan (Self Rescue)**
This plan is to be utilized should the tram become inoperative at a point between the upper or lower loading platform, where exiting the tram would place the employees in a fall hazard risk area. If attempts to restart the tram are unsuccessful, the tram will be locked out and the evacuation process initiated. A custom designed platform will be attached to the tram. This platform will bridge the small gap between the tram and the existing snow shed which contains a full staircase. Responders will create an opening in the side of the snow shed adjacent to the tram location. The platform will be extended to bridge the gap and the tram passengers will exit and enter the snow shed.
The design, manufacture, installation and testing/training and documentation of the Evacuation plan will be accomplished:
***Corrective Action Date: 12/31/2014***

**Plan 2 – Rescue Plan**
This plan will be utilized in the event that if, during the operation of the tram there is a serious injury, or it is being used to evacuate a non-ambulatory person and the tram becomes inoperative, and is therefore imperative that Emergency Response Personnel are utilized in the rescue. As part of this plan, Emergency Response Personnel will determine the best course of action depending upon the status of the injury, tram location and equipment on hand. This may result in the utilization of the Evacuation Plan or combination thereof.
The design, testing/training and documentation of the Rescue Plan will be accomplished:
***Corrective Action Date: 12/31/2014***

***CPUC Open Item #15:*** *Contingencies are not in place for the plant; such as emergency extrication, evacuation or sheltering in place for seismic fire emergencies where the tram, stairs or trail become unavailable due to instability or inaccessibility*

**PG&E Response:**
This is not a staffed facility and as such does not have regular full time employees. However, there are typically 2 annual planned outage periods that entail a staffed presence for the duration of the outage. Prior to an outage, there is an

extensive planning period which includes the development and review of an emergency response plan. The Emergency Response Plan will be reviewed and updated to ensure that there are processes or procedures that take into account those emergencies that may compromise the normal egress paths and provide essential items for shelter in place.
***Corrective Action Date: 12/31/2014***

***CPUC Open Item #16:*** *The tram does not meet industry standard for Safety. For example:*

1. *The tram car does not have an emergency brake*
2. *There is no runaway arrest mechanism for the unlikely event of cable separation*
3. *There is no safe emergency egress from the tram car*
4. *The tram car has no auxiliary power unit or winch to convey passengers to safety in the case of a controller failure, power loss or primary motor failure*

**PG&E Response:**
To address the above comment, PG&E reviewed the current installation and focused in on three main areas of risk: Egress from the tram, Wire Rope Integrity and System Mechanical Integrity. These areas were analyzed against industry best practices and in some cases underwent additional testing that exceeded best practices.
The following items were also considered as part of the analysis:

- Limited operation of the tram which is approximately 400 trips per year, which consists of mostly light personnel transport, greatly improves the longevity of the tram system components.
- The currently installed winch and wire rope were installed in 2012 with improved automated controls.
- The wire rope has a designed Safety Factor (SF) of 22:1 for passenger transport. Industry best practice for passenger loading would provide a Safety factor of 10:1 (ANSI Tramway standards require a 6:1 Safety Factor).

**Item 16 Example (1) and Example (4) System Mechanical Integrity***

1. Assessment of Braking Capability
   The tram has 4 modes that provide braking action to the tram. All were tested independently with the tram operating at full speed. Independent testing of each is easily accomplished.
   - Motor – The inherent design of the motor results in motor torque stopping tram independent of the brakes. This was tested with a 5,150 lb. load (total weight 9,750 lbs.) with the tram operating at full speed.
   - Worm Gear – Tested and supports load for free fall reduction. This was tested with a 5,150 lb. load (total weight 9,750 lbs.) with the tram operating at full speed.
   - Output Shaft Brake - This was tested with a 5,150 lb. load (total weight 9,750 lbs.) with the tram operating at full speed.
   - Input Shaft Brake (sized for personnel load) - This was tested with a 5,150 lb. load (total weight 9,750 lbs.) with the tram operating at full speed.
2. Increase inspection cycle for brakes - Add a 90 day inspection to visually inspect the brakes to the Annual and Quad inspection cycle (no load test)
   **Corrective Action Date: 12/31/2014**
3. Test brakes functionally during Annual inspection -Add a requirement to the Annual to visually inspect and test the brakes functionally with a 5,500 lb. load (Load Test)
   **Corrective Action Date: 12/31/2014**
4. Test brake system during Quad inspection - Add a requirement to the Quad inspection to visually inspect and functionally test the individual brakes with 5,150# accomplish a load test using 125% of capacity (Load Test)
   **Corrective Action Date: 12/31/2014**
5. Output shaft to Pinion Keyway and Drive Gear to Drum Inspection - Add a 90 day inspection to the Annual and Quad inspection cycle
   **Corrective Action Date: 12/31/2014**

6. Provide a back-up source of power to ensure tram operability if primary source is lost - PG&E is in the process of purchasing and installing a generator to be permanently onsite. In the meantime a temporary generator will be used as a back-up source of power.
   **Corrective Action Date: Temporary generator - 12/31/2014**
   **Permanent generator – 2015, timeline subject to permitting**

**Item 16 Example (1) Tram requires method to ensure that it cannot physically move during egress**

Through testing it was validated that when electric power is removed from the system, the brakes cannot be disengaged from the brake drums. The brakes are in the normally closed position and must have power applied to them to be disengaged. Ensuring the brakes remain engaged can be achieved by shutting off the breaker providing power to the system (Lockout/Tagout procedure). Once this has been performed, the tram will not move unless there is a failure of: The haul rope, haul rope connection at tram, the hoist drum connection, or the pinion gear keyway. These are mitigated by increased testing, inspection and design improvements. However, while PG&E has validated that the above system and process will ensure that the tram will not move during egress, we have elected to evaluate the feasibility of an additional device to act as a parking brake.
**Corrective Action Date: 12/31/2014**

**Item 16 Example (2) Wire Rope Integrity**

1. Install secondary cable attachment at the tram
   Install an improved redundant attach point from the tram to the main haul cable
   **Corrective Action Date: 12/31/2014**
2. Install cable guard to protect cable from mechanical damage
   Protect exposed section of cable between upper loading platform and tram house with removable sections.
   **Corrective Action Date: 12/31/2014**
3. Perform Magnetic Resonance Testing of Wire Rope (MRT)
   Accomplish baseline testing and add requirement to Annual and Quad inspections
   **Corrective Action Date: COMPLETED on 07/16/2014**
4. Improve cable deflection at top sheave
   Remove current 8 inch diameter terminal sheave and replace with 10 inch diameter sheave
   **Corrective Action Date: 12/31/2014**

**Item 16 Example (3) Tram Egress –** See response to item #14

**Item 16 Example (4) System Mechanical Integrity –** See Response Above along with Item 16 Example (1)