

Spaulding Tram Operational Instructions

Summary

This document provides operational instructions for the Spaulding Powerhouse (PH) Tramway.

Level of Use: Reference Use

Target Audience

This procedure applies to all PG&E employees who may be deemed qualified to operate the Spaulding Tramway.

Safety

Only trained PG&E employees are allowed to operate tramways within PG&E's system. Non-PG&E employees are not permitted to operate the Spaulding PH Tramway.

When using the Spaulding PH Tramway to perform maintenance or inspections of the tramway tracks or support structure, appropriate fall protection or fall restraint devices must be used any time employees are outside the confines of the tram in accordance with Utility Standard [SAFE-1012S, "Fall Protection Standard."](#)

Report tramway problems or operational failures immediately to the Drum Switching Center at (530) 389-2115 for follow-up and action.

Before You Start

1. Compare the publication date and version number on your working copy of this procedure against the published version in the Guidance Document Library to verify that it is current.
2. Read this entire procedure to be familiarized with the operation of Spaulding PH Tramway and facility.
3. Receive a tailboard on the operation of the tramway as part of your training before operating the tram.
4. Use three-way communication.
5. Before operating the tramway, alert all personnel in the tram house, powerhouse, and on the tram car of the planned operation (movement).

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Procedure Steps

1 General Tramway Information

- 1.1 The Spaulding Tramway provides a mechanical means of ingress and egress to Spaulding #1 PH for both personnel and equipment.
 1. Alternative means of personnel ingress and egress include the stairway adjacent to the tram tracks and the trail descending from the Spaulding #1 Dam.
- 1.2 The unloaded car weight is 4,600 pounds (lbs.).
- 1.3 10,000 lbs. maximum additional load is allowed, but only 1,500 lbs. maximum combined load is allowed with passengers, or in any combination with cargo.
- 1.4 The tram car is raised and lowered on the tracks by a single steel cable that is wrapped around a drum hoist in the tram-house.
 1. This drum hoist is driven by a variable speed motor.
 2. There are also two brakes, which are disengaged while the drive motor is turning, and are re-engaged while the motor is at rest.
 3. The drum hoist motor operates at two speeds: normal and slow.
 4. As the tram approaches the landing zones at the top and bottom of the tram, limit switches pick up and slow the drum hoist before the tram comes to a stop.

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- 1.5 The main controller panel is located in the tram house behind the drum hoist.
 1. It is powered through a Tram Disconnect Switch and a Main Power Switch.
 2. These main supply switches are normally left in the ON position to supply electricity to the internal heaters.
- 1.6 The Tram Control ON/OFF switch is located near the center of the main panel, under a locked cover.
 1. It is used to enable and disable the tram on a daily basis.
- 1.7 The motor controller has two modes of operation: LOCAL and REMOTE.
 1. Personnel may only be transported in REMOTE control.
 2. LOCAL control is used for daily pre-operational testing or cargo operations and may be used to retrieve the tram car from the bottom of the tracks (see Item 1.12 below).
 3. The LOCAL/REMOTE switch is located on the upper right of the main panel, under a locked cover. (Remote operation is in either Radio #1 or Radio #2.)
- 1.8 There is a flashing beacon light above the top platform whenever the motor controller is active in either LOCAL or REMOTE.
- 1.9 With the beacon flashing, motion of the car and cable is possible.



CAUTION

Use caution when the beacon is flashing.

- 1.10 There is a horn button on each controller, used by the operator to indicate intended movement.
 1. The horns are located at both the top and bottom of the tram.
- 1.11 Honk the horn and wait 15 seconds before moving the car.
- 1.12 When the tram car is at the very bottom of the track, there will be a yellow light on at the local control panel and yellow tape on the cable next to the operator.
- 1.13 If there are personnel working inside the Spaulding #1 PH, contact the powerhouse by Company phone 5235 or 5236 and verify that the tram is clear before proceeding.

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WARNING

When the tram car is at the top of the tracks, do not attempt to travel the car to the bottom using a remote control at the bottom. The operator must be in sight of the cable at all times.

- 1.14 The tram must be tested daily before each use. See Daily Test section
- 1.15 At the end of the day, place the main ON/OFF switch in the OFF position and lock the cover closed.
- 1.16 If for any reason the tram must be disabled, this locked cover is the clearance point.
- 1.17 Following tram use, IF snow is forecasted before the next intended use,
THEN travel the tram car to the bottom of the tracks.
- 1.18 Before a PG&E employee is authorized to operate the Spaulding PH Tramway, he or she must do all of the following:
 1. Visually verify all controls referenced in this procedure,
 2. Receive an onsite tailboard from a designated competent trainer, and
 3. Understand all functions related to operations.
- 1.19 The operator must sit on the uphill bench to ensure that he or she can observe all of the passengers during tram operation.
- 1.20 Any time personnel exit the confines of the tram when it is not parked at the upper or lower landings, they must use fall protection in accordance with Utility Standard SAFE-1012S, "Fall Protection Standard."
- 1.21 The operator of the tram is responsible for ensuring that all passengers follow the safety requirements of this procedure.
- 1.22 The operator of the tram must conduct a tailboard for all passengers who are not documented as qualified tramway operators.
 1. The passengers must sign the tailboard, AND
 2. The signed tailboard must be kept on file at the powerhouse.

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2 Daily Inspection and Functional Test

- 2.1 Once at the Spaulding Tram House, notify the Drum Switching Center (Company phone 5000, outside line (530) 389-2115) of intention to use the tram.
- 2.2 Perform a complete trial run before use.
 1. With no personnel on the cart, run the tram cart up and down the track either with the wireless remote controls or via the joystick on the Tram Manual Operation Panel.
- 2.3 The operator or other qualified person must perform a daily visual inspection for all functional mechanisms before use.
- 2.4 Inspect the upper deck and the track to verify that they are clear of snow and debris.
- 2.5 Clear any debris as necessary.



WARNING

The tram house door must remain unlocked during tram operations in case the tram must be stopped in an emergency condition.

- 2.6 Unlock the tram house door and leave it unlocked.
 1. Entry into the tram building requires a #2a water key.
- 2.7 Inspect the drum hoist and confirm that there are no loose cable wraps or binding of the cable.
- 2.8 Check or place the Tram Disconnect to ON.
- 2.9 Check or place the Main Power Switch to ON.
- 2.10 Unlock and place the Rotary Tram Control Switch to ON.
- 2.11 Unlock and check or place the tram in LOCAL control.
- 2.12 Verify that the green power indication light is ON.

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- 2.13 Go to the LOCAL control panel.
1. IF the tram car is at the very bottom,

THEN there will be a yellow indicating light on at the local control panel and yellow tape on the cable next to the operator.
 2. IF this is the case, AND there are personnel working inside the Spaulding #1 PH,

THEN contact the powerhouse by Company phone 5235 or 5236 to verify that the tram is clear before proceeding.
- 2.14 At the LOCAL control panel, check or pull the Emergency Stop (E-Stop), honk the horn four times, and wait 15 seconds.
- 2.15 Raise and/or lower the tram car to check proper operation of both brakes.
- 2.16 IF the tram car is on the upper deck,

THEN begin to lower the tram toward the crest.
1. Pushing assistance may be needed at the car to ensure that no slack develops in cable on the drum hoist as it pays out.
- 2.17 Check proper operation of the high and low speed limit switches by travelling the cart down the tracks until there is a noticeable increase in speed.
- 2.18 Recheck the operation of the brakes by stopping the cart on the tracks.
- 2.19 Verify that the cable is paying in and out properly.
- 2.20 IF the operation is normal,

THEN the tram is ready for use.
- 2.21 IF the operation is not normal,

THEN STOP and notify the Drum Switching Center.
- 3 Local Control Panel – Cargo Only Operation**
- 3.1 The maximum cargo load is 10,000 lbs.
 - 3.2 No passengers are allowed when the tramway is in LOCAL control.
 - 3.3 The LOCAL control panel is enabled at the main panel, indicated by a green light on the main panel and a flashing beacon over the platform.

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- 3.4 Next to the LOCAL panel, there is a window looking down the tracks towards the loading platform.
 - 1. There is also full view of the cable, drum, and the drive machinery (including the brakes).
- 3.5 There is an E-Stop button.
- 3.6 There is a horn button.
- 3.7 There is a yellow light on the LOCAL panel and tape on the winch cable indicating that the tram is at the bottom.
- 3.8 There is a two-speed UP/DOWN toggle switch.
- 3.9 Observe the car's motion in relation to the winch drum.
- 3.10 STOP if any loose cable wraps develop and allow the car's speed to catch up to the speed of the cable before continuing.
- 3.11 Operating in the LOCAL mode requires initial communication between the operator in the tram house and any personnel at the bottom of the hill.
 - 1. Having initial communication lets the operator in the tram house know when it is safe to either raise or lower the cart, and that it is in LOCAL mode.
 - 2. This ensures that no personnel are injured during this mode.
 - 3. Communication may be via walkie-talkies, cell phones, or land line phone.
 - 4. The Company phone number for Spaulding #1 PH is 5235.
 - 5. The Company phone number for the tram house is 5236.

4 Remote Control Operation

- 4.1 Remote control is enabled at the main control panel by switching to either Radio #1 or Radio #2.
- 4.2 There is an E-Stop button.
- 4.3 There is a horn button.
- 4.4 There is a transmitter START/ON/OFF switch.
- 4.5 There is a two-speed UP/DOWN toggle.
- 4.6 The Bypass Switch is not used.

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- 4.7 Press START and wait 15 seconds.
- 4.8 Press START again.
- 4.9 There is a 15-second delay start on the remote.
 - 1. When descending from the top platform, the operator must initially follow behind the car, verifying that the cable is paying out normally.
 - 2. Slack on the winch drum is not allowed, as this could lead to a runaway tram and an abrupt stop.
 - 3. The drum hoist must be STOPPED if the car is not moving.
 - 4. Snow, ice, and debris on the tracks all increase this risk.
- 4.10 IF no motion is detected after this 15-second period, STOP.
 - 1. Reverse the winch to remove any slack.
 - 2. Push the car to verify free movement and continue.

5 Passengers



The operator must travel with passengers to ensure their safety.

- 5.1 The tram must be operated by remote control ONLY.
- 5.2 The combined passenger load is 1,500 lbs.
 - 1. For more than 1,500 lbs., see the Cargo Operations section.
- 5.3 Passengers must be seated on the tram car benches facing downhill.
- 5.4 Seating is not allowed on any other area of the tram car.

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NOTE

Refer to the Snow Removal section for specific instructions when removing snow.

- 5.5 All passengers must remain within view of the operator when the car is in motion.
 - 5.6 Only two persons are allowed per seat, with a maximum of six persons total.
 - 1. Call for additional passengers before departure if the tram is not full.
 - 5.7 Watch for slippery conditions (e.g., oil, snow, or ice) when boarding and exiting the car.
 - 1. Ice melt and shovels are available in the storage area.
 - 5.8 Cargo must be secured and loose items must be stowed.
 - 5.9 Make sure all passengers are comfortable with their seating and let the operator know when all passengers are ready.
 - 5.10 Passengers are expected to lean forward at the top of the tramway.
 - 1. Seats will level out when the front of the car drops down below the crest.
 - 2. The reverse is true when coming back up.
 - 5.11 A flashing beacon on top indicates possible movement.
 - 5.12 A horn honk indicates intended movement.
 - 5.13 Watch for pinch points between the moving car and stationary objects.
 - 5.14 There is limited head clearance at the bottom.
 - 5.15 Keep your hands and feet in the car at all times and remain seated.
- 6 Tram Operation When Removing Snow From Tracks**
- 6.1 Personnel who will be performing snow removal tasks must use fall protection during the snow removal activity in accordance with Utility Standard SAFE-1012S, "Fall Protection Standard."
 - 6.2 Removing snow from the tram tracks requires a minimum of two people: one to operate the tram via remote control and a second to clear the snow off the tracks.
 - 1. If available, a third person can assist in removing snow from the tracks.
 - 2. No more than three people may participate in snow removal.

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- 6.3 When removing snow, begin at the bottom of the tracks and progress up the track to the tram house.
- 6.4 The tram operator must sit in the middle bench seat and monitor the actions of the personnel clearing the snow.
- 6.5 The person(s) removing snow sit on the tram deck, facing backward (uphill), and remove snow using a snow shovel.
- 6.6 IF two people are used to remove snow,
THEN they must sit side by side.



The tram car must be stationary while personnel are removing snow. Personnel must be seated on the tram bench seat facing downhill when the tram car is in motion.

- 6.7 As snow removal progresses, the person(s) removing the snow communicate with the tram operator, using three-way communication, and request the tram be travelled up the tracks as much as necessary.
 - 6.8 When the tram is in motion, the person(s) removing snow move from the uphill edge of the tram deck to the third bench seat and wait there until the tram is in the proper position to continue snow removal.
 - 6.9 Continue this process until the entire length of track is cleared.
- 7 Tram House Notification of Entry**
- 7.1 Call the Drum Switching Center, Company phone 5000 or outside line (530) 389-2115, to provide notification of reason for entry, number and names of personnel, and expected completion time.
 - 7.2 When work is complete and before leaving for the day, call the Drum Switching Center and provide notification of work completed, number and names of personnel leaving for the day, and the tramway status.

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8 Controller Failure During Passenger Operation

- 8.1 All passengers riding the tram must be aware that during operation the tram may perform an E-Stop.
- 8.2 The E-Stop most often results from a signal loss with the tram house radio controller.
- 8.3 It is critical that passengers maintain a secure hold to the car in the event of an E-Stop.
- 8.4 The tramway operator must tailboard all passengers of the potential for an E-Stop while the tram is in motion.
- 8.5 If the tram fails midway, remain on the cart and use a portable radio or cell phone to contact the Drum Switching Center to restore operation of the tram or to implement rescue procedures.

9 Training

- 9.1 Drum Hydro supervisors designate employees from each of their respective crews who are authorized tramway operators.
- 9.2 These employees, by reason of experience, familiarity with the tramway operation, and known hazards, will be designated as competent trainers.
- 9.3 The competent trainers review this procedure with the trainee on site to verify understanding and ability to safely operate the tramway.
- 9.4 Training request must be initiated by the PG&E employee's supervisor.
- 9.5 Once the trainee has completed the onsite tailboard and has demonstrated his or her understanding of the tramway operations, the competent trainer logs the tailboard completion in the tramway log book.
 1. Learning Services will develop a course code to log and document training completion.
- 9.6 Loss of Tramway Operator Authorization
 1. IF an employee has not operated the tramway within a 1-year time period,

THEN he or she is no longer considered authorized and may not operate the tramway without receiving refresher training from a competent trainer.

END of Instructions

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Definitions

NA

Implementation Responsibilities

The Central Area manager is responsible for approving this procedure.

The Drum Switching Center generation supervisor is responsible for issuing and revising this procedure.

Governing Document

NA

Compliance Requirement / Regulatory Commitment

NA

Reference Documents

Developmental References:

- Spaulding 1 Tram Operating Procedure (Quick Guide) – 1/23/2013
- Electrical Arrangement Tram House, Drawing 4081372
- Electrical Arrangement Tram House, Drawing 4081373
- Electrical Control Tram House, Drawing 4081374
- Elementary Control Tram Office, Drawing 4081375

Supplemental References:

NA

Appendices

NA

Attachments

Attachment 1, [“Spaulding Powerhouse Tramway Safety Tailboard”](#)

Document Recision

This procedure supersedes Power Generation Procedure PG-3514P-01, Spaulding Tram Operational Instructions,” dated 12/13/2013.

Spaulding Tram Operational Instructions

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Revision Notes

Where?	What Changed?
“Safety” section	Added fall protection requirements for maintenance and inspections of the tramway tracks or support structure per SAFE-1012S.
Item 1-19 – 1.22	Added fall protection requirements any time a person exits the confines of the tram per SAFE-1012S, and added the requirement for a tailboard.
Item 6.1	Added fall protection requirements for snow removal per SAFE-1012S.
Throughout	This is a new document

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SAFETY TAILBOARD



Spaulding Powerhouse Tramway

The operator of the tram is responsible for ensuring that all passengers adhere to safety requirements while using the tram and must conduct a tailboard to confirm that passengers understand the potential hazards associated with the tram operation.

Note: The operator MUST travel with passengers to ensure their safety

Passenger Requirements/Expectations

- The combined passenger load is not to exceed 1,500 lbs.
- Only two persons are allowed per seat, with a maximum of six persons total
- Passengers must secure their tools and/or personal items in the Job Box on the tram car
- Passengers can find emergency flashlights in the Job Box
- Watch for slippery conditions (e.g. oil, snow or ice) when boarding or exiting the tram car
 1. Ice melt and shovels are available in the storage area
- When traveling on the tram, passengers must sit on the benches facing downhill
- Passengers may not stand on the tram car while in motion
- Passengers must keep their hands, arms and legs within the confines of the tram car at all times while in motion
- Passengers must stay alert and watch for pinch points between the moving car and stationary objects such as the loading platforms
- Passengers must not try to retrieve dropped objects from the tram car while in motion
- Passengers must be aware of limited head clearance at the bottom of the tram while boarding or exiting the tram car
- All passengers must remain within view of the operator when the car is in motion
- A beacon light is found above the top platform and when the beacon light is flashing motion of the tram car and cable is possible
- Each passenger must let the operator know they are comfortable with their setting and ready to depart
- When all passengers are ready to depart, the operator will honk the horn and wait 15 seconds before moving the tram car
- Passengers are expected to lean forward at the top of the tramway
 1. Seats will level out when the front of the car drops down below the crest
 2. The reverse is true when coming back up

Controller Failure during Passenger Operation

- All passengers must be aware that during operation the tram may perform an emergency stop (E-Stop)
- The E-Stop most often results from a signal loss with the tram house radio controller
- Passengers must maintain a secure hold to the car at **ALL times** in the event of an E-Stop
- Passengers must remain seated on the tram car and use a portable radio or cell phone, outside line (530) 389-2115, to contact the Drum Switching Center to restore operation of the tram or to implement rescue procedures

