Calistoga Incident Investigation Report

SAFETY AND ENFORCEMENT DIVISION

GAS SAFETY AND RELIABILITY BRANCH

April 2, 2024

Final Report

Report Date:	April 2, 2024
Investigators:	Angel Garcia, Mohammad Ali, Matt Epuna
Date incident reported to CPUC	May 2, 2022
Utility:	Pacific Gas and Electric Company (PG&E)
Date and Time of the Incident:	April 29, 2022 @ 17: 00 Hours
Location of the Incident:	Calistoga, CA, Napa County

California Public Utilities Commission

Table of Contents

Executive Summary

Summary of Incident

On May 2, 2022, PG&E personnel reported a non-DOT reportable incident to the California Public Utilities Commission, Safety and Enforcement Division (SED). The incident occurred on April 29, 2022, during a Strength Test Project T-1448B, in the City of Calistoga, Napa County, California. PG&E indicated in its report that it took a pipeline segment "Out-of-Service" and performed a hydrotest to ensure pipeline integrity and subsequently began a drying operation with a foam pig. PG&E's employees were performing the drying pig operation on the pipeline segment (2.4 miles) that ran along St. Helena Hwy in Calistoga. The drying operation was to remove the water/moisture from the pipeline segment that was recently hydrotested before returning the pipeline segment into service. The incident occurred during the pipe drying operation.

T-1448B project was split into two segments. Segment #1 spans from Location K to Location H and Segment #2 spans from Location H to Location A. PG&E's RCE report indicated a seven-person GTGC crew was assigned to conduct the drying pig operation. The crew was split into two teams. A team of four people oversaw the launching of the pig from one end while another team of three people oversaw receiving of the pig at the other end. The crew completed the drying pig operation of Segment #1 and began the drying pig operation on Segment #2 on April 29, 2022. The crew completed the 11th pig run when the crew ran out of foam pigs. The Foreman-H ordered additional pigs from the PG&E's stockyard, and it was delivered.

After receipt, the crew resumed the drying pig run. On the 12th pig run, the crew decided to run two drying pigs in quick succession instead of a single pig at a time. The crew immediately identified that the two pigs were stuck in the pipeline. The crew developed a plan to dislodge the stuck pigs. PG&E's internal Root Cause Evaluation (RCE) report that was prepared by a cross-functional team of Subject Matter Experts within the company, indicated that one of the plans the crew developed was to reverse the launcher and receiver roles and the GTGC crew responsibilities.

To carry out this plan, PG&E installed an air compressor at location A to push the foam pig in the reverse direction of what the crew had done in the previous 11 pig runs. Location H was to serve as the foam pig receiver and Location A was to serve as the launcher. Although the functions of the receiver and the launcher were to be reversed, the crew members' locations did not change.

Foreman-H at location H instructed one of the crew members (the Construction Operator-H) to open the blow-down valve on location H which was subsequently serving as a receiver. After opening the blowdown valve, Construction Operator-H, accompanied by Foreman-H, walked to the receiver door. Foreman-H opened the launcher (serving as receiver) door to look inside the receiver with a flashlight. While Foreman-H and Construction Operator-H were looking inside the launcher, the pigs became dislodged and ejected out of the receiver. Both workers were airlifted to local hospitals. PG&E indicated that Construction Operator-H sustained facial fractures and was later released from the hospital. Foreman-H sustained major brain injuries and passed away days later.

PG&E's internal team of multi-function Subject Matter Experts conducted a Root Cause Evaluation (RCE) of the incident, identified root causes, and set goals for several corrective actions. One of the corrective actions PG&E proposed in its RCE was to design and build a pigging test platform at its facilities in Winters, CA for in-person hands-on training.

Although this incident was non-DOT reportable, SED investigated the incident and concluded that PG&E committed probable violations of General Order (G.O.) 112-F, Reference Title 49 Code of Federal Regulations (CFR), Part 192, Sections 192.750, 192.13(c), 192.805 and 192.809(e).

Incident Investigation

Summary of Incident and Investigation

On May 2, 2022, PG&E personnel confirmed a non-DOT reportable incident that occurred at Strength Test Project T-1448B in the city of Calistoga, Napa County, California. The incident occurred during the drying process of an Out-of-Service pipeline as part of PG&E's pipeline test/replacement program. Two clean foam drying pigs were launched in quick succession, one light density foam swab pig and one medium-density poly pig. The crews determined that the pigs were stuck. The crews developed a plan to dislodge the stuck pigs. The Foreman-H instructed Construction Operator-H to open the blow-down valve on the receiver. After opening the blowdown valve, the Construction Operator-H walked to the receiver door (was used as a launcher) and Foreman-H opened the receiver door to look inside the receiver with a flashlight. While the Foreman-H and Construction Operator-H were looking inside the launcher with a flashlight, the pigs became fully unstuck and were ejected out of the receiver hitting both employees. Emergency services responded and the two coworkers were airlifted to local hospitals. One sustained a facial fracture and was released from the hospital after a couple of days. The other coworker sustained major brain injuries and passed away after a few days. There was no customer impact.

Fatalities / Injuries

One fatality and one injury were reported.

Property Damage

There was no property damage reported due to the incident.

Utility Facilities Involved

DFM-0405-01 - 6" and 8" diameter transmission pipeline from Mile Points (MP) 25.90-28.30, running parallel to St. Helena Hwy. in Calistoga, CA.

Investigators

	Name	Title
1.	Angel Garcia	SED, Senior Utilities Engineer Specialist
2.	Mohammad Ali	SED, Senior Utilities Engineer Supervisor
3.	Matt Epuna	SED, Program and Project Supervisor

Documents Reviewed

See Appendix B.

SED Investigation Process

Reporting Requirements

General Order (G.O.) 112-F, Reference Title 49 Code of Federal Regulations (CFR), Part 191, Section 191.5 requires that each operator give notice in accordance with paragraph (b) of this section of each incident as defined in § 191.3. However, Part 191, Section 191.3 defines an *"incident"* as "*An event that involves* ***a release of gas from a pipeline (emphasis added),*** *gas from an underground natural gas storage facility (UNGSF), liquefied natural gas, liquefied petroleum gas, refrigerant gas, or gas from an LNG facility, and that results in one or more of the following consequences:…".* Since this incident did not involve release of natural gas, PG&E classified the May 2, 2022 incident as non-DOT reportable. This incident did not meet the federal Department of Transportation (DOT) Reportable Incident requirement for reporting.

Although the event was not DOT reportable, PG&E reported the incident to SED on May 2, 2022. PG&E reported that its Gas Transmission Gas Construction (GTGC) crew was performing an out-of-service pipeline pigging operation to dry a recently hydrotested pipeline as part of PG&E's Strength Test Project T-1448B in Calistoga, CA, when a non-DOT reportable incident occurred that caused serious injuries to two employees, with one ultimately becoming fatal.

SED Investigation

The Gas Safety and Reliability Branch (GSRB) of SED began the investigation of this pipeline incident on May 6, 2022. A Senior Utilities Engineer-Specialist (SUE-Specialist) was assigned the role of lead investigator. On March 10, 2023, the SUE-Specialist left the Commission to pursue a job offer. However, SED continued its investigation of this incident. SED prepared and submitted several data requests to PG&E.

SED's investigation of this incident involved interviews of relevant PG&E personnel including an eyewitness. SED reviewed PG&E's RCE report, pertinent PG&E employee training records, PG&E's Operator Qualification records, and related operation and maintenance standards and procedures. SED spent several months trying to secure an interview with PG&E's Director of Gas Technical Training who retired from PG&E shortly after the incident. However, SED was unable to secure an interview with the Director.

The purpose of this investigation was to determine whether there were probable violations of G.O. 112-F Reference Title 49 Code of Federal Regulations (CFR) Part 192, that may have caused or contributed to the incident. Furthermore, SED was interested in determining if the operator was implementing corrective actions to prevent similar incidents in the future.

Incident Description

PG&E's data request responses included PG&E's internal Root Cause Evaluation (RCE) report that PG&E prepared from its investigation of this incident by a cross-functional team of its Subject Matter Experts. PG&E's RCE report is comprehensive and detailed in its process and the identification of relevant data. The RCE applied various failure analysis approaches including a Factor Tree analysis approach in its evaluation of various root causes of the incident. Furthermore, it evaluated the effectiveness and the gaps of the existing barriers in preventing this incident.

The RCE report provided PG&E's detailed information regarding the roles and responsibilities during Strength Test Project T-1448B. It examined employees' interview statements. Some of the information contained in the RCE report was confirmed by some of the individuals SED interviewed.

PG&E's RCE report indicated that PG&E assigned a seven-person Gas Transmission Gas Construction (GTGC) crew and two contract inspectors to perform the drying pig operation work associated with the strength test project, T-1448B. The T-1448B project spans from Location A to Location K (see Fig. 1). The T-1448B project drying pig operation was split into two segments. Segment #1 spans from Location K to Location H and Segment #2 spans from Location H to Location A. PG&E's RCE report indicated the seven-person GTGC crew was split into two teams. A team of four people oversaw the launching of the pig from one end while another team of three people oversaw receiving of the pig at the other end. The GTGC crew began the drying operations of pipeline segment #1 a few days before the incident and completed the drying operation of pipeline segment #1 on the morning of April 29, 2022.

[redacted]

Figure 1. Map of Proposed Pipeline Strength Test Project T-1448B - Hydrotest and Pipe Drying

PG&E's RCE report indicated that the GTGC crew then shifted operations to dry pipeline segment #2 which runs from Location H to Location A. The launcher was installed at Location H and the receiver was installed at Location A. To launch the drying pig, an air compressor and dryer were connected to the launcher. The launching team consisted of a Foreman (Foreman-H), a Construction Operator (Construction Operator-H), Utility Worker (Utility Worker-H), and contract laborer (Contract Laborer-H). The receiving team consisted of a Working Leader (Working Leader-A), Construction Operator (Construction Operator-A), and a Backhoe Operator (Backhoe Operator-A). One contract inspector was assigned to be at each location (Inspector-A and Inspector-H). The GTGC crew titles and corresponding roles are listed below in Table 1.

Table 1. PG&E's GTGC Crew Job Titles and Roles & Responsibilities according to the RCE Report

Job Title (Current Position, Unless Noted)	Organization	Role During Event
Gas Working Leader-A	PG&E	Lead coworker supporting pigging operations at Location A
Gas Construction Operator-A	PG&E	Construction Operator supporting pigging operations at Location A
Gas Backhoe Operator-A	PG&E	Backhoe Operator supporting pigging operations at Location A
Utility Worker-H	PG&E	Utility Worker supporting pigging operations at Location H, and at Location H at the time of the incident
Gas Construction Operator-H	PG&E	Construction Operator supporting pigging operations at Location H; One of the injured parties
Inspector-A	Contractor – TRC Companies	Contract Inspector supporting pigging operations at Location A
Inspector-H	Contractor - GIE	Contract Inspector supporting pigging operations at Location H; at Location H at the time of the incident
Coater-H	Contractor – Snelson	Contract Coater supporting T-1448B project; at Location H at the time of the incident
Lead Inspector	Contractor – GIE	Lead Contract Inspector supporting pigging operations remotely for both Location A and Location H
Supervisor, Gas Transmission & Distribution	PG&E	Supervisor of crew performing pigging operations at Location H and A
Senior Gas Engineer	PG&E	Project Engineer for T-1448B
Pigging SME	Contractor – TRC Companies	Contract pigging SME provided onsite support during cleaning runs for T-1448B

Senior Gas System Planning Engineer	PG&E	Transmission Gas Planner for T-1448B
Pigging Contractor Lead	Milbar	Contractor pigging lead, whose crew supported the clearing operations for T-1448B and was involved with ordering the pigs
GC Field Engineer-H	PG&E	Field Engineer supporting T-1448B; was onsite on the day of the event; acting as Test Supervisor.

The RCE report indicated that the GTGC crew had successfully completed 11 drying pig runs before they ran out of clean foam swab pigs. The pig run process was to be repeated until the desired dew point conditions inside the pipe were met as defined in the project specification of the "Hydrostatic Test Procedure with Cleaning". Two GTGC crew members informed SED during separate interviews that Foreman-H requested additional pigs to be delivered to Location H from PG&E's local GTGC yard. The RCE report indicated that on the 12th drying pig run, the Foreman at Location H decided to launch two different pig densities in quick succession. After the two pigs were launched, the GTGC crew at location H identified that the pigs were stuck (see Figs. 2 and 3).

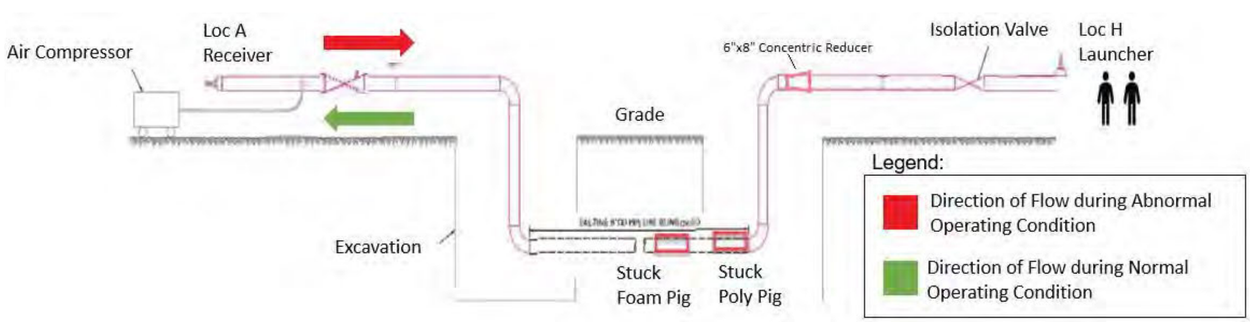

Figure 2. Schematic of Pipeline Configuration and Operations

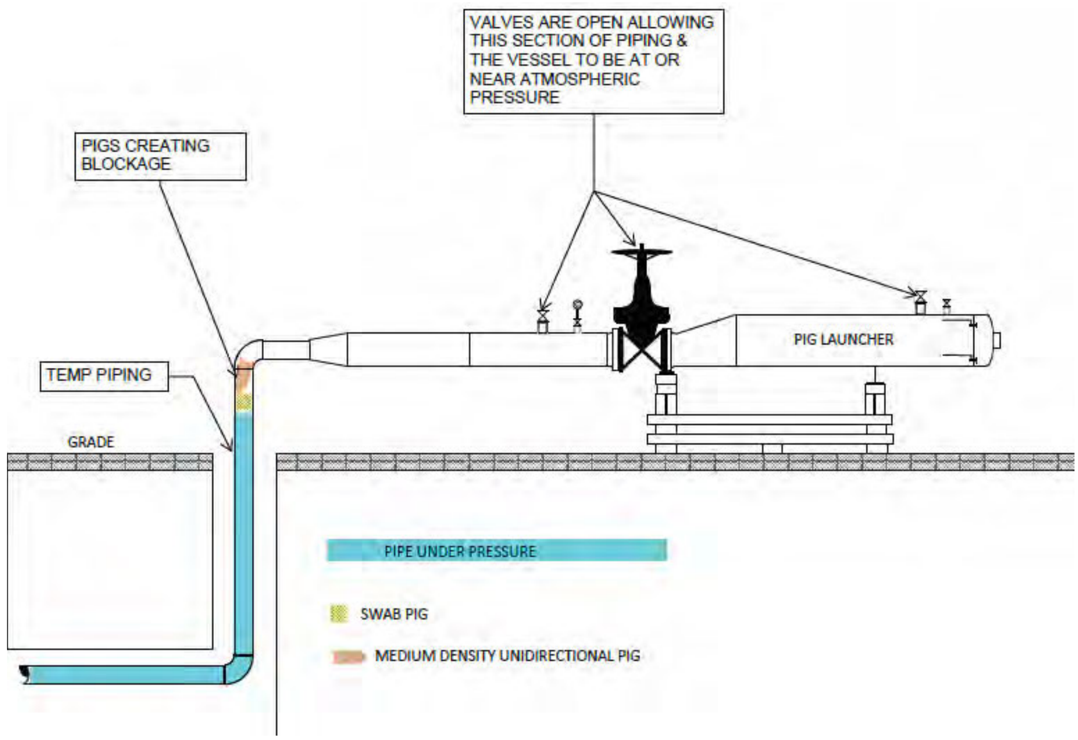

Figure 3. Diagram of the Pipeline and the Launcher Depicting the two Stuck Pigs

The RCE report indicated that the GTGC crew at location H developed a plan to dislodge the stuck pigs and this was confirmed by Construction Operator-H during an SED interview. Part of the plan was to reverse the launching and receiving locations, roles, and responsibilities. Under the plan, location A would act as launcher and location H as the receiver. The GTGC crew at location A was instructed to use the Air Compressor to apply a back pressure on the foam pig to push it back to location H which would act as the receiver (see Figures 4 and 5).

The RCE report indicated the following:

1) After a few attempts, the crew at Location H noticed pipe movement and believed that the stuck pigs had become dislodged.

2) Foreman-H and Construction Operator-H (both located at Location H) went to the launcher, and Foreman-H instructed Construction Operator-H to open the blow-down valve on the launcher. Construction Operator-H stated during the SED interview that Foreman-H and Construction Operator-H were using a flashlight to look inside the launcher (see Figures 6 and 7). While Foreman-H and Construction Operator-H were looking inside the launcher, the stuck pigs became dislodged and ejected out of the launcher. The Foreman-H and Construction Operator-H received injuries to their faces. The First Aid Emergency Services responded, the Foreman-H and the Construction Operator-H were both airlifted to local hospitals. The Construction Operator-H sustained facial fractures and was later released from the hospital. Foreman-H sustained major brain injuries and passed away days later.

Figure 4. PG&E's Receiver and associated temporary piping installed on at Location A

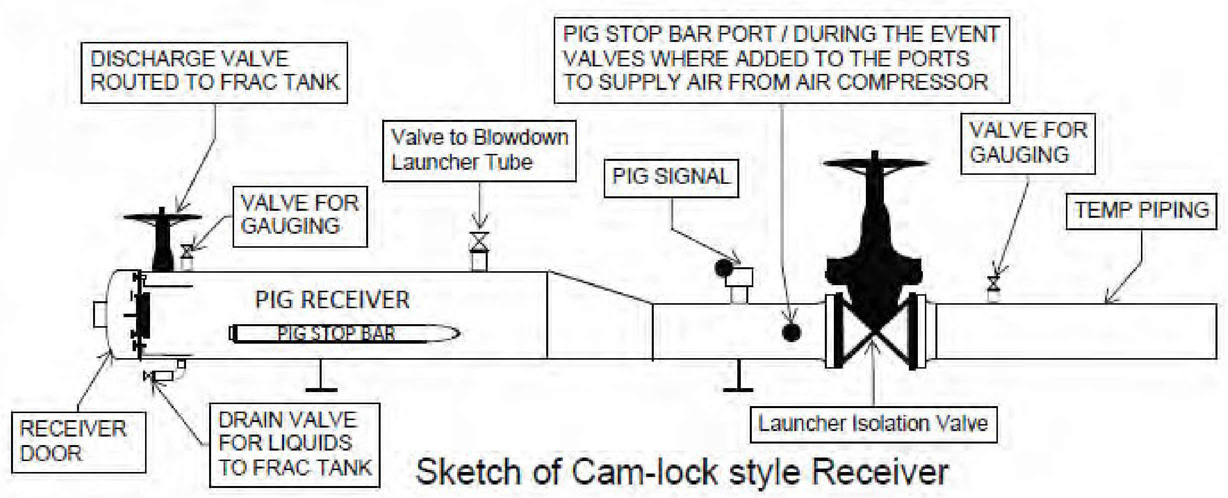

Figure 5. Schematic of Receiver components installed at Location A

Figure 6. PG&E's Launcher and associated temporary piping installed on H-A pipe section at Location H

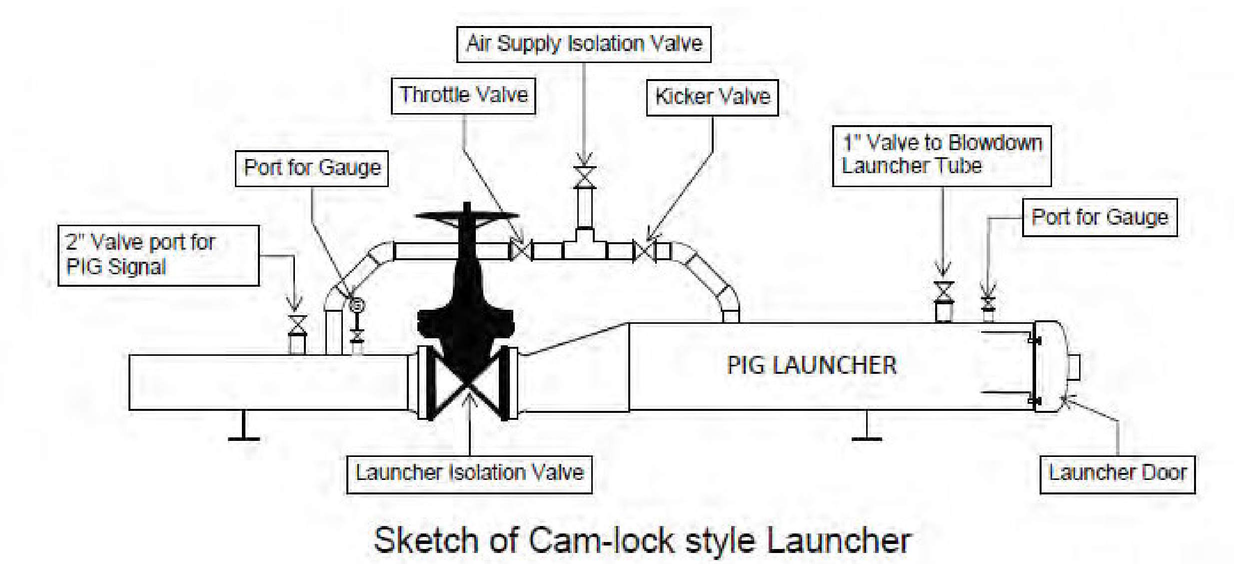

Figure 7. Schematic of Launcher components installed at Location H

3) The RCE report indicated that "there are two main pig types used to support drying operations after a hydrotest" (see figure 8). PG&E indicated that only one of the two foam pigs used on this project was recommended for the T-1448B project drying operation. PG&E recommended a light-density (1-2 lbs./ft3) drying pig that absorbs water and moisture in the pipeline. The foam poly pigs, can be light-density (1-2 lbs/ft3), medium-density (5-8 lbs/ft3), or even greater density and it is used to push standing water out of the pipeline. The RCE report indicated that Poly pigs can be one-directional (bullet-nosed) and include a cone shape on the front of the pig, as seen on the yellow bare swab bullet pig. They are also available as bi-directional with a flat surface on both ends. The RCE report indicated that a note in the PG&E's Hydrostatic Test Procedure with cleaning recommended only light-density poly pigs should be used; however, the additional pigs the crew used after the 11th pig run were medium density pigs.

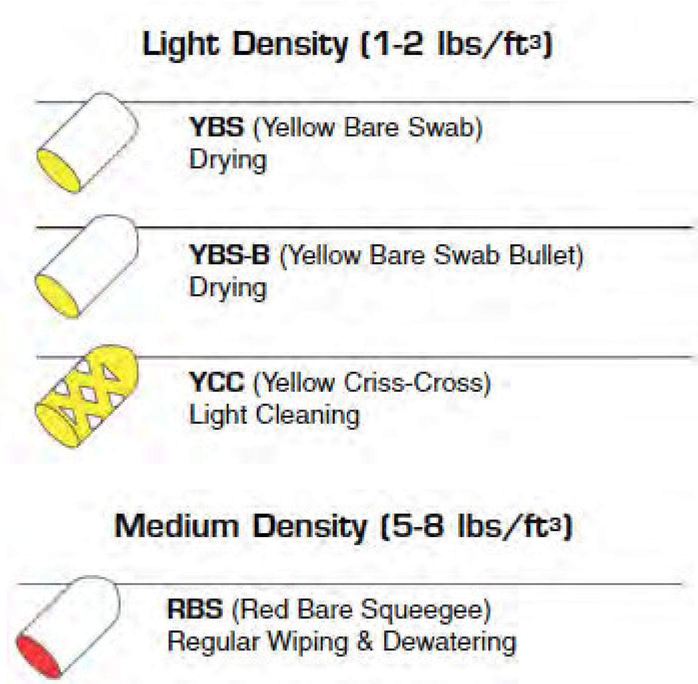

Figure 8. PG&E's Pig Swabs Specifications

Chronology of Incident Investigation Activities

This section provides a chronology of the investigative activities undertaken after the incident occurred on 4/29/2022 and reported to CPUC on 5/2/2022.

April 29, 2022

On April 29, 2022, at around 1700 hours, a PG&E crew was performing out-of-service pigging to dry a hydrotested pipeline in Calistoga, CA. While the crew applied back pressure to unstick two stuck cleaning pigs, the pigs became unstuck and ejected, hitting two crew members, resulting in two injuries, one ultimately becoming fatal.

May 2, 2022

After the incident occurred on 4/29/2022, PG&E provided a courtesy notification to CPUC on May 2, 2022 as a non-reportable incident.

June 9, 2022

On June 9, 2022, in response to SED's request, PG&E indicated that there were no Operator Qualification (OQ) Covered Tasks for pig launching and receiving operations. Employees were required to follow TD-4137P-03, Drying Procedure for Pipelines (effective 3/17/2021) and TD-4810P-11, In-Line Inspections (effective 02/01/2022) when operating pig launchers for Out-of-Service pigging. However, these procedures did not address how to dislodge stuck pigs for an Out-of-Service pipeline.

October 25, 2022

On October 25, 2022, during separate interviews, PG&E's Gas Working Leader-A and the Construction Operator-H informed SED that they were not aware of the TD-4137P-03, Drying Procedure for Pipelines (effective 3/17/2021).

December 12, 2022

On December 12, 2022, PG&E provided SED an updated TD-4137P-03, Drying Procedure for Pipelines, effective 11/30/2022, and the new TD-4139S, Pigging Field Operations Control, effective 11/30/2022, as the procedures required to be followed during the pig drying process for Out-of-Service pipeline.

August 2, 2023

SED conducted an in-person interview with the new PG&E Director of Gas Technical Training. The Director indicated that he joined PG&E on 2/6/2023, after the Calistoga incident. His responsibility was to direct and manage PG&E's training program. In response to SED's questions regarding hydrotesting, ILI/Pigging, OQ program, etc., he referred SED to the PG&E' s manager of OQ.

August 3, 2023

SED conducted an in-person interview with Gas Working Leader-A (see Appendix C).

August 24, 2023

SED conducted an online video interview with the Manager of Operator Qualification (OQ) Program (see Appendix C).

October 24, 2023

SED conducted an online video interview with the Construction Operator-H (see Appendix C).

Findings and Corrective Actions

PG&E'S Root Cause Evaluation

PG&E initiated an internal investigation titled Root Cause Evaluation (RCE) that involved PG&E's cross-functional team of Subject Matter Experts (Team). The Team conducted an in-depth analysis and applied several root cause evaluation tools including a Barrier Analysis, Timeline Analysis, Human Factors Analysis Classification System (HFACS), and a Factor Tree Analysis. The Team prepared the RCE report based on its investigation and analysis. The RCE report made the following written observations:

- PG&E had a written procedure that governs pipeline drying operations (TD-4137P-03) and the procedure identified the need to stop flow in the pipeline and vent pressure to 0 psig before opening the receiver.
- The GTGC crew were not referencing the procedure when performing operations and relied on their experience and knowledge to perform the pigging operations and free the stuck pigs.
- The GTGC crew only vented the line flat to attain zero pressure and then opened the launcher door to insert another pig, which does not align with PG&E's procedure TD-4137P-03.
- PG&E did not provide guidance in procedure TD-4137P-03 on what steps to take in response to an AOC, including a stuck pig.
- Nobody closed the isolation valve on the launcher prior to opening the launcher door while Foreman-H and Construction Operator-H were standing in the line of fire.
- During drying runs #1-11 performed earlier in the day (4/29/2022), the launching crew at Location H was not utilizing the launcher isolation valve unless they launched two pigs in the same run.
- Scenarios which led to the increased risk of a pig getting stuck:
  - launching two pigs of different densities in tandem;
  - configuration of fittings (elbows and reducers) in the temporary piping;
  - insufficient number of pigs supplied to the project, leading the GTGC crew to bring surplus materials from the yard
- The surplus pigs brought from the yard did not meet the specifications outlined in the hydrotest project documents.
- There were gaps in the risk assessment and identification process in both the planning and preparing phases of the work for out-of-service pigging.

- The planning phase failed to identify appropriate controls commensurate with the level of risk associated with the job.
- The controls identified for similar in-service pigging were not applied to out of-service pigging.
- In-service pigging is performed under a Gas Clearance, which includes a documented sequence of operations, a single point of accountability for all valve operations, and the use of Lock Out Tag Out (LOTO) to control the hazardous energy. PG&E did not perform a Gas clearance during out-of-service pigging operations performed on the day of the incident.
- PG&E did not ensure the GTGC crew assigned to perform drying work on project T-1448B had the technical skills and expertise to perform the work safely, identify hazards, and react to abnormal operating conditions (AOC).

The RCE report identified the following root causes:

Causes:

1. <u>Direct Cause - 1:</u> The launcher isolation valve was opened when the launcher door was opened, resulting in a release of stored energy (air pressure) and ejection of the pigs following stuck pig mitigation efforts.
2. <u>Direct Cause – 2:</u> Coworkers were physically in the line of fire without proper identification and isolation of hazardous energy.
3. <u>Root Cause -1:</u> Hazards and risks of performing out-of-service pigging were not properly identified and mitigated when planning, preparing, and executing work.
    - <u>Contributing Cause -1:</u> Work planning processes failed to identify and mitigate coworker safety risks for out-of-service pigging, including failure to associate the known and similar risks of in-service pigging.
    - <u>Contributing Cause-2:</u> Work preparation process weaknesses led to challenges related to use of proper tools, materials, and training.
    - <u>Contributing Cause – 3:</u> Effective communication practices were not adhered to when executing the work.
    - <u>Contributing Cause – 4:</u> Lack of knowledge and experience led to improper utilization, reinforcement, and adherence to procedures.

SED's Findings

SED's investigation noted the following findings:

1) **G.O. 112-F Referenced Title 49 CFR, Part 192, Section 192.750 Launcher and receiver safety.**

    § 192.750 Launcher and receiver safety states:

    Any launcher or receiver used after July 1, 2021, must be equipped with a device capable of safely relieving pressure in the barrel before removal or opening of the launcher or receiver barrel closure or flange and insertion or removal of in-line inspection tools, scrapers, or spheres. An operator must use a device to either: Indicate that pressure has been relieved in the barrel; or alternatively prevent opening of the barrel closure or flange when pressurized, or insertion or removal of in-line devices (e.g. inspection tools, scrapers, or spheres), if pressure has not been relieved.

The RCE report indicated that the launcher and receiver doors were equipped with Cam Lock levers and functioned as designed. The GTGC crew at location H had access to an isolation gate valve designed to isolate hazardous energy but the isolation gate valve was not closed before the Construction Operator-H opened the launcher (was temporarily serving as a receiver) door.

Although the RCE report noted that a pig stop safety mechanism was not required in this case because the launcher was functioning as a receiver at the time, the launcher design did not allow for the use of such device. The RCE indicated there was an isolation gate valve designed to isolate hazardous energy that PG&E or its contractors did not close before opening the receiver door. However, installation of an engineered control mechanism on the Launcher and/or Receiver to prevent opening of the barrel closure or flange when pressurized, or insertion or removal of in-line devices, if pressure has not been relieved may have prevented the door from being open while under pressure even if the individuals at location H ignored all safety precautions.

Therefore, PG&E is in probable violation of G.O. 112-F, Reference Title 49 CFR, Part 192, Section 192.750 for failure to incorporate into the design of launcher or receiver used after July 1, 2021, a device to prevent opening of the barrel closure or flange when pressurized, or insertion or removal of in-line devices (e.g. inspection tools, scrapers, or spheres), if pressure has not been relieved.

2). G.O. 112-F Referenced Title 49 CFR, Part 192, Section 192.13 What general requirements apply to pipelines regulated under this part.

§ 192.13 What general requirements apply to pipelines regulated under this part:

(c) Each operator shall maintain, modify as appropriate, and follow the plans, procedures, and programs that it is required to establish under this part.

PG&E had an existing written Pigging Procedure and Drying Procedure for Pipelines prior to the incident. PG&E's procedure TD-4137P-03, Drying Procedure for Pipelines, was the applicable procedure for the task the GTGC crew were performing. However, the two members of the GTGC crew informed SED during separate interviews that they were not aware of the written procedure and did not follow procedure TD-4137P-03; instead, they relied on their experience and knowledge to perform the drying pig operations. In addition, the RCE report confirmed that some of the GTGC crew members stated that they were unaware of PG&E's Standard TD-4137P-03. Furthermore, the RCE report noted that PG&E's Standard TD-4137P-03 did not provide guidance on what steps to take in response to an abnormal operating condition (AOC), including a stuck pig. PG&E prepared written procedure TD-4137P-03 but the GTGC crew was unaware of the procedure and did not follow it.

Therefore, PG&E is in probable violation of G.O. 112-F, Reference Title 49 CFR, Part 192, Section 192.13(c) for failure to ensure the GTGC crew followed the applicable Pigging and Drying procedures it was required to establish.

3). G.O. 112-F Referenced Title 49 CFR, Part 192, Sections 192.805 Qualification program and 192.809 General.

§ 192.805 Qualification Program States in part:

Each operator shall have and follow a written qualification program. The program shall include provisions to:

(a) Identify covered tasks.

(b) Ensure through evaluation that individuals performing covered tasks are qualified.

(c) Allow individuals that are not qualified pursuant to this subpart to perform a covered task if directed and observed by an individual that is qualified.

…

(f) Communicate changes that affect covered tasks to individuals performing those covered tasks.

(g) Identify those covered tasks and the intervals at which evaluation of the individual's qualifications is needed.

(h) After December 16, 2004, provide training, as appropriate, to ensure that individuals performing covered tasks have the necessary knowledge and skills to perform the tasks in a manner that ensures the safe operation of pipeline facilities,

Furthermore,

§ 192.809 General states in part:

(e) After December 16, 2004, observation of on-the-job performance may not be used as the sole method of evaluation.

PG&E has and maintains a written Operator Qualification (OQ) Program. However, PG&E did not identify Pipeline Pigging and Drying Operation as a Covered Task. In PHMSA's Interpretation PI-22-0008, dated 06/08/2022, PHMSA stated "as pipeline pigs are used for O&M pipeline activities and are integral to meeting the integrity management requirements of Part 192, the launching and receiving of pipeline pigs is a task that meets the "four-part-test" in § 192.801(b)..."

PG&E failed to conduct the OQ evaluation of the individuals performing the Covered Task. In addition, PG&E failed to provide training, as appropriate to ensure that individuals performing the covered tasks have the necessary knowledge and skills to perform the tasks in a manner that ensures the safe operation of pipeline facilities. PG&E's Standard TD-41375-03 did not provide guidance on what steps to take, or how to recognize and react to an AOC, including dislodging a stuck pig.

Therefore, PG&E is in probable violation of G.O. 112-F, Reference Title 49 CFR, Part 192, Sections 192.805(a)(b)(c)(f)(g)(h) for failure to identify pipeline pigging and drying operations as covered tasks. Furthermore, PG&E is in probable violation of 192.809(e) for failure to conduct the OQ evaluation of the individuals performing a Covered Task and failure to train them on how to recognize and react to an AOC, including dislodging a stuck pig.

SED's Recommendations

1. PG&E should take the appropriate steps to address SED Finding #1
2. PG&E should take the appropriate steps to address SED Finding #2
3. PG&E should take the appropriate steps to address SED Finding #3

SED's Observations

This section details three (3) observations SED made over the course of the investigation. SED will follow-up and monitor the progress of PG&E's proposed corrective actions.

Observation 1:

Following the incident, PG&E developed Utility Standard TD-4139S – Pigging Field Operations Control effective from 11/30/2022.

Observation 2:

PG&E developed two training components on pigging strategy to address knowledge, skill, and abilities in areas of pigging operations: a) Web Based Training (WBT) GAS-0865 which became available to PG&E's employees on September 1, 2023, that included video simulations of the pigging process, key components and terms, and abnormal operating conditions (AOCs); b) An instructor-led training to be available in 2024 will address the technical scope and complexities of pigging activities, such as manipulation of the system's twin-lock door mechanism, safe loading, pipeline pressurization, pig launching, monitoring, depressurizing during receiving, and safe unloading. These tasks are ideally addressed through direct employee involvement. Hands-on experience is preferred for both learning comprehension and retainment for receiving and safe unloading training.

Observation 3:

PG&E expects to design and construct a pigging test loop at its Winters facility and finalize in-person training in late 2024.

Conclusion

Based on the records, interviews, and the RCE report that SED reviewed during this investigation, SED concluded that PG&E committed probable violations of General Order (G.O.) 112-F, Reference Title 49 Code of Federal Regulations (CFR), Part 192, Sections 192.750, 192.13(c), 192.805, and 192.809(e).

PG&E's failure to incorporate into the design of its launcher or receiver (used after July 1, 2021) a device to prevent opening of the barrel closure or flange when pressurized, or insertion or removal of in-line devices, if pressure has not been relieved is a probable violation of 49 CFR Part 192, Section 192.750.

Furthermore, PG&E's failure to ensure the GTGC crew followed its written procedure for pigging and drying pipelines is a probable violation of 49 CFR Part 192, Section 192.13(c).

Additionally, PG&E is in probable violation of G.O. 112-F, Reference Title 49 CFR, Part 192, Sections 192.805(a)(b)(c)(f)(g)(h) for its failure to identify pipeline pigging and drying operations as covered tasks.

Finally, PG&E is in probable violation of 192.809(e) for its failure to conduct the OQ evaluation of the individuals performing a Covered Task and failure to train them on how to recognize and react to an AOC, including dislodging a stuck pig.

Appendices

Appendix A: Glossary of terms

ACRONYM/ABBREVIATION	DEFINITION
AOC	Abnormal Operating Conditions
CFR	Code of Federal Regulation
DFM	Distribution Feeder Main
GO	General Order
GSRB	Gas Safety and Reliability Branch
ILI	In-Line Inspection
MP	Mile Point
OQ	Operator Qualification
PG&E	Pacific Gas and Electric Company
PHMSA	Pipeline & Hazardous Materials Safety Administration
RCE	Root Cause Evaluation
SED	Safety and Enforcement Division
SIF	Serious Injury or Fatality
TIMP	Transmission Integrity Management Program
WBT	Web-based Training

Appendix B: Documents Reviewed

1.	Root Cause Evaluation (RCE) Report SIF-Actual Incident, 9/16/2022
2.	PG&E Incident Report to SED, GSRB 2/20/2023
3.	Interview report with Director Gas Technical Training, PG&E 8/2/2023
4.	Interview report with Working Lead, PG&E 8/3/2023
5.	Interview report with Manager OQ Program, PG&E 8/24,2023
6.	Interview report with Construction Operator, PG&E, 10/24/2023
7.	PG&E's Response to SED's Data Request 10/23/2023
8.	Utility Procedure TD-4810P-23, Strength Test as an Integrity Assessment
9.	Utility Procedure TD-4137P-01, Test Procedure for New Pipelines
10.	Utility Procedure TD-4137P-02, Test Procedure for Existing Pipelines
11.	Utility Procedure TD-4137P-03, Drying Procedure for Pipelines
12.	Utility Procedure TD-4137P-04, Test Procedure for Pipelines Using Air, Inert, or Natural Gas
13.	Utility Procedure TD-4139S Pigging Field Operations Control

Appendix C: Interviews

On October 25, 2022, during an interview with SED, the Gas Working Leader-A and the injured employee, Construction Operator-H, confirmed the events that happened during the launch of the drying pig. The Gas Working Leader-A and the Construction Operator-H informed SED that they were not aware of the company's written procedures for Pigging Field Operations Control (TD-4139S) or Drying Procedure for Pipelines (TD-4137P-03).

On December 12, 2022, PG&E provided an updated TD-4137P-03, Drying Procedure for Pipelines, effective 11/30/2022, and the new TD-4139S, Pigging Field Operations Control, as the procedures required to be followed during the pig drying process for Out-of-Service pipeline became effective on 11/30/2022.

On August 2, 2023, SED conducted an in-person interview with PG&E's new Director, Gas Technical Training. The Director indicated that he joined PG&E on 2/6/2023 after the Calistoga incident. His responsibility was to direct and manage PG&E's training program. In response to questions regarding hydrotesting, ILI/Pigging, OQ program, etc., he referred SED to PG&E's Manager of Operator Qualification Program.

On August 3, 2023, SED conducted an in-person interview with PG&E's Gas Working Leader-A. He indicated that his responsibility was to set up the jobsites, investigate the environmental aspect, dewatering, and mentor workers at the site. Being the most senior worker, he was allowed to provide on-the-job training (OJT) to others. The Gas Working Leader-A stated that his pigging and hydrotesting operation training was OJT. He received OJT and worked on a couple of hydrotesting projects prior to the T-1448B strength test project. In response to a question about his observation about the incident, he indicated that he was on location A of the project when he heard about the incident. He mentioned that he never saw any PG&E pigging, hydrotesting, or drying Standards. However, he indicated that he had the knowledge about pressure testing, dewatering, and drying of pipeline after hydrotesting.

On August 24, 2023, SED conducted a video interview with the Manager of Operator Qualification (OQ) Program. The duties and responsibilities of the manager of the OQ program were to manage the administration of the PG&E's Operator Qualification Program. The manager of OQ program was not aware of any in-person or on-line hydrotesting training program. When asked if Pigging and Hydrotest were identified as OQ Covered Tasks, the manager of the OQ program indicated that Pigging and Hydrotest were not identified as OQ Covered Tasks. Regarding PG&E's ILI/Pigging program, the manager of the OQ program indicated that the Pigging of in-service pipelines and Hydrotesting tasks were performed by Contractors.

On October 24, 2023, SED conducted a video interview with the Construction Operator-H (who was injured on 4/29/22 during the incident). Construction Operator-H mentioned that he participated in only one hydrotesting before the incident and did not participate in any pigging operations. His pigging and hydrotesting trainings were on-the-job-training (OJT). He indicated that he was trained in the field by his supervisor. He did not have formal classroom training for pigging or hydrotesting. The Construction Operator indicated that he was not aware of any of PG&E's pigging operations procedure TD-4137P-03.

On October 25, 2023, during separate interviews with SED, the Construction Operator-H informed SED that he was not aware of the written procedure TD- 4137P-03, Drying Procedure for Pipelines (pig launcher and receiver). Also, he informed SED that their pig launching and receiving training was OJT.