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May 29, 2024

Mr. Terence Eng, P.E.
Gas Safety and Reliability Branch
Safety and Enforcement Division
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

Re: Notice of Probable Violations – 4/29/22 Gas Pipeline Incident in Calistoga

Dear Mr. Eng:

Pacific Gas and Electric Company (PG&E) submits this response to the Safety and Enforcement Division's (SED) Notice of Probable Violations (NOPV) letter dated April 29, 2024, regarding the gas pipeline incident that occurred on April 29, 2022 in Calistoga, CA. For clarity, the three NOPVs identified in Attachment A of SED's NOPV letter are repeated below, followed by PG&E's response.

NOPV #1: §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 (Root Cause Evaluation) report indicated that the launcher and receiver doors were equipped with Cam Lock levers and functioned as designed. The GTGC (Gas Transmission Gas Construction) 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.

PG&E Response to NOPV #1:

PG&E regrettably acknowledges that the step of closing the isolation gate valve designed to isolate hazardous energy before opening the launcher door was missed. However, PG&E respectfully disagrees that we are in violation of §192.750 since this code section is about the design of pig launchers and receivers, and not about how the valves (e.g., isolation valve) and appurtenances installed on these pig launchers and receivers are operated. §192.750 requires launchers and receivers to "be equipped with *a device capable of safely relieving pressure* [emphasis added] in the barrel…" The receiver at location H was equipped with such a device by using a 1" blowdown valve installed on the barrel (see Figure 1 below, highlighted in yellow). In addition, the air supply isolation valve shown in Figure 1 can serve as a secondary device to "safely reliev[e] pressure in the barrel" if the throttle valve was closed and kicker valve was open. Therefore, Figure 1 demonstrates that PG&E's standard design of pig launchers and receivers is adequate in meeting the design requirements of §192.750 and is capable of safely relieving pressure in the barrel.

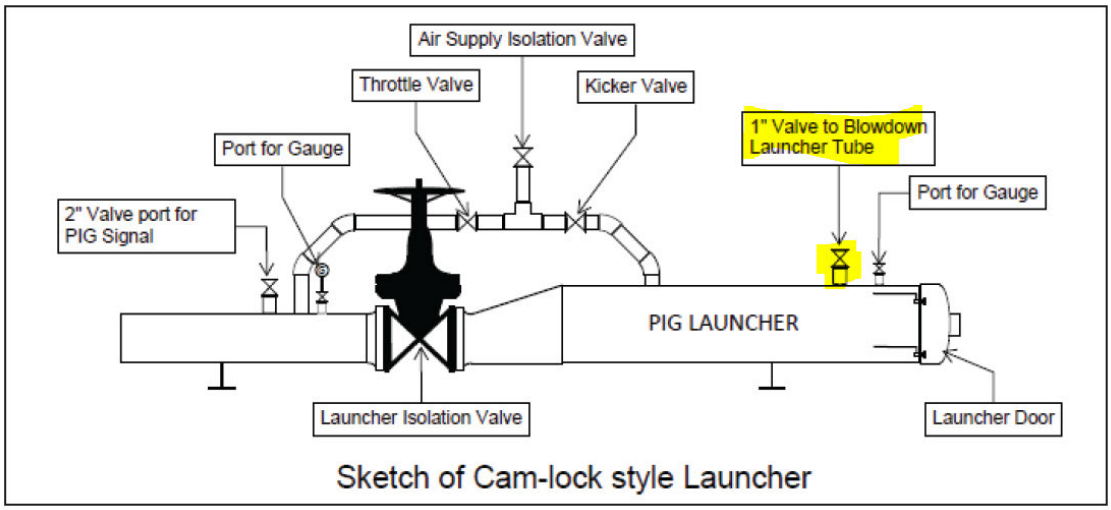

Figure 1. Schematic of pig launcher (used as receiver) at Location H

Furthermore, §192.750 allows operators to use two different methods to use said "device": 1) "indicate that pressure has been relieved in the barrel;" *OR* 2) "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." To satisfy the first method, PG&E utilized the 1" blowdown valve to depressurize the launcher barrel and verified that air was no longer venting. In conjunction, PG&E also used a calibrated pressure gauge[1] installed on the gauge port located to the right of the blowdown valve as shown in Figure 1 to verify that the barrel was depressurized (zero pressure)[2]. However, because the stuck pigs were still inside the pipeline, it caused a tight seal that prevented air from traveling farther downstream to the 1" blowdown valve and pressure gauge, giving PG&E personnel a false impression that the barrel had already been depressurized. The launcher door was not opened until these precautionary safety steps were performed to verify the air pressure in the barrel was at zero, but the zero pressure was only a false indication. To satisfy the second method, PG&E equipped the launcher and receiver doors with cam-locks as safety devices to prevent the doors from being opened under pressure. As SED notes, these cam-locks "functioned as designed," which is consistent with PG&E's investigation findings. Page 36 of PG&E's RCE report states that "[d]ue to the design of launcher, the door cannot be opened when the launcher is pressurized without excessive force" and further details that PG&E's "ATS completed a visual inspection of the launcher and launcher door and did not identify any signs of damage or failure due to a forced entry." These investigation results provide evidence that the cam-locks on the doors performed effectively as the required safety device and the launcher barrel had indeed been depressurized in order for PG&E personnel to open the launcher door. These facts also demonstrate that not only does PG&E's standard design for pig launchers and receivers have more than one "device" as required by §192.750, but our design also exceeds the code requirements by fulfilling the use of *both* methods instead of only one. Additionally,

[1] Refer to page 28 of PG&E's RCE report that states that calibrated Crystal pressure gauges were used at locations H and A.
[2] Refer to page 36 of PG&E's RCE report that states the pressure in the launcher was flat (zero pressure).

"no specification exists for temporary piping associated with out-of-service pigging"[3] in the industry, which is the case for the Calistoga incident.

PG&E is deeply saddened by the tragedy associated with this Calistoga incident and is continuously improving to prevent similar incidents from occurring in the future. Although PG&E believes that our current standard design of pig launchers and receivers meets the design requirements of §192.750, we developed two corrective actions[4] to further strengthen the design of our launchers and receivers to make their operations as infallible as possible. These two corrective actions and their current statuses are shown in Figure 2 below.

Root Cause – 1: Hazards and risks of performing out-of-service pigging were not properly identified and mitigated when planning, preparing, and executing work.		
CA #	**CA Description**	**Completion Date**
CAPR-2	**Type of Control:** Engineered Control **Action:** Design universal out-of-service launcher/receiver which can be used bi-directionally, consider best practices from industry • Include requirement for pipe restraints on launcher and receiver • Include pressure alert valve (PAV) on launcher/receiver doors to prevent opening of door when launcher/receiver is pressurized. • Evaluate ability to add an engineered control into isolation valve & receiver door (interlocked)* **Deliverables:** 1. Provide typical design of universal launcher/receiver & construction specifications 2. Provide a list and schedule of 2023/2024 projects that would require a newly built temporary launcher/receiver *Note: If an engineered control is not available at the time of corrective action closure, initiate a CAP to perform an annual check to determine if an engineered control has become available on the market.	7/14/2023
CAPR-3	**Type of Control:** Engineered Control **Action:** Develop a plan to fund and build/purchase new universal out-of-service launchers and receivers per the specifications outlined in CAPR-2. These new launchers and receivers to be used once internal crews are trained and qualified to perform these operations (see CA-3 and CA-4). **Deliverables:** 1. Funding and procurement plan for new universal out- of-service launcher and receivers required to meet project portfolio needs.	6/30/2023

Figure 2. Corrective actions regarding improving the design of our pig launchers and receivers to prevent recurrence

It is PG&E's top priority to prevent similar incidents from happening again in the future. We believe that having an improved universal out-of-service launcher/receiver design, and proper training for our internal crews to go along with the new design, is a step in the right direction and is crucial to living out our stand that everyone and everything is always safe.

[3] Page 19 of PG&E's RCE report
[4] Page 56 of PG&E's RCE report

NOPV #2: §192.13(c) 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.

PG&E Response to NOPV #2:

PG&E recognizes the shortcomings in employee awareness regarding TD-4137P-03, Drying Procedure for Pipelines. As summarized below, PG&E has implemented a number of corrective actions to ensure procedural awareness and compliance when performing pigging and drying operations going forward, and welcomes any feedback SED may have on further improvements.

PG&E would like to clarify that guidance on responding to pigging AOCs, including stuck pigs, was available at the time of the Calistoga incident. This guidance was provided in TD-4810P-11, In-Line Inspections (Rev. 2c), which was published on January 19, 2022.[5] TD-4810P-11 (Rev. 2c) section 5.5.10, titled "Stuck Pig Remediation," outlines the necessary operational steps to consider when a stuck pig is found, including guidance on make-safe operations, locating the pig, evaluating pressure differential required to dislodge the pig, and developing a cutout plan to retrieve the stuck pig. Although this is not intended to be an exhaustive list, PG&E believes that this provides field personnel with a solid foundation to start diagnostics on the situation and to develop the proper remediation for each unique situation. Furthermore, section 5.5.1.a also instructs PG&E personnel to develop a contingency plan prior to executing the in-line inspection (ILI) run in case a cleaning pig or smart tool gets stuck in the pipeline, which commonly includes using pressure differentials to dislodge a pig as the GTGC crew attempted to do during the Calistoga incident.

TD-4137P-03 has been revised three times since its original publication in 2013 in efforts to continuously improve our guidance documents as we gain new experiences in the field and to address concerns raised by employees. Since the incident, PG&E revised TD-4137P-03 by leveraging our investigation results in the RCE report and published the new revision on November 30, 2022 for all Gas employees to use.[6] In addition, we created an accompanying guidance tailboard for Gas Operations leaders to apprise personnel performing pipeline drying operations of the procedural updates and to ensure personnel are aware of the scope of these operations. This latest revision provides additional guidance on determining the need for pipeline drying, selecting drying methods, performing absorption and evaporative drying, and taking dew point measurements.

Moreover, PG&E strives to learn and improve from this incident and determined that it would be desirable to develop a new standalone procedure to provide guidance on out-of-service pigging operations.[7] On top of publishing a revised TD-4137P-03 on November 30, 2022, PG&E also published a new guidance document TD-4139S, Pigging Field Operations Control, on the same day.[8] This new guidance document creates a new

[5] TD-4810P-11 (Rev. 2c) was provided to the SED on June 8, 2022 in a data request associated with Index 15835
[6] A copy of this revision was provided to the SED on December 12, 2022 under Index 15889 Supp01
[7] Page 55 of PG&E's RCE report
[8] A copy of the new TD-4139S guidance document was provided to the SED on December 12, 2022 under Index 15889 Supp01

administrative and engineering control by leveraging lock-out-tag-out (LOTO) practices, provides supplemental guidance on AOC identification and response (e.g., stuck pigs) and develops a quality control process to ensure that relevant procedures are followed. Please see Figure 3 below for additional details. As part of this effort, PG&E also created additional ILI-specific operator qualifications and training on pigging operations as discussed in more detail in our response to NOPV #3 below.

Root Cause – 1: Hazards and risks of performing out-of-service pigging were not properly identified and mitigated when planning, preparing, and executing work.		
CA #	**CA Description**	**Completion Date**
CAPR- 1	**Type of Control:** Administrative and Engineering (LOTO) **Action:** Develop a standalone out-of-service pigging field operations procedure, which will include the following requirements (controls) similar to what is outlined in a Gas Clearance: 1. Use of a documented sequence of operations (similar to a Gas Clearance) template to be completed and tailored to every out-of-service pigging project not performed under a formal Clearance, including hold points to verify full isolation and no pressure in the receiver/launcher before opening the door 2. Establish a single point of accountability (person-in- charge) for the pigging operations, with managing the operations being their sole focus (same as a Clearance Supervisor) 3. Verification of differential pressure across isolation valve and no pressure in receiver/launcher before opening the door 4. LOTO requirements, including how to tag equipment 5. Requirement to always use isolation valve when receiving pigs 6. AOC response process (e.g. stuck pigs) including stop work and requirement to re-tailboard (What can/cannot be done, who needs to be involved in the remediation plan, max differential pressure, reversing flow as a last resort, etc.) 7. Any additional recommendations provided from JHA completed as part of CA-2 8. Typical materials used for pigging processes (drying and cleaning), including estimated quantities based upon best practices, and steps to take if not enough pigs were provided for the project 9. Engineering and QA/QC to re-evaluate the hydrotest and drying documents to ensure that they comply with new procedure. 10. Remove pigging operation details from existing drying procedure. **Deliverables:** 1. Complete & obtain CalOSHA approval of pilot out-of- service Pigging template 2. Publish approved procedure for out-of-service Pigging	11/30/2022

Figure 3. Corrective action to develop standalone out-of-service pigging procedure to provide better guidance to field personnel

NOPV #3: §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-4137[P]-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.

PG&E Response to NOPV #3:

The PHMSA interpretation (PI-22-0008) that SED referenced was published on June 8, 2022, after the Calistoga incident had occurred on April 29, 2022. PG&E would not have known about this PHMSA interpretation nor their stance prior to the Calistoga incident; and for this reason, PG&E respectfully disagrees that we are in violation of §192.805(a)(b)(c)(f)(g)(h) and §192.809(e).

PI-22-0008 was initiated by the National Transportation Safety Board (NTSB), as they were not clear on whether ILI was a covered task. The NTSB noted in their interpretation request that "industry standards such as API 1161, Recommended Practice for Pipeline Operator Qualification (OQ), and ANSI/GPTC Z380.1, Guide for Gas Transmission, Distribution, and Gathering Piping Systems, *may not prompt operators to identify launching and receiving pigs as a covered task* [emphasis added]." Since ILI/pigging operations are not explicitly required in the Code of Federal Regulations Title 49 Part 192 to be considered a covered task, operators in the industry will look to industry standards such as API 1161 and ANSI/GPTC Z380.1 to provide additional guidance on this topic. If these industry standards also do not explicitly require ILI to be a covered task, then it is logical for operators to not develop OQs specific to ILI, especially when there are existing OQs that overlap and are applicable to pigging, such as operating air movers, purging with air/gas, performing leak tests, etc. These overlapping OQs ensure that employees are trained and competent in performing ILI tasks. PG&E is not unique in this situation as evidenced by our benchmarking efforts with other operators.[9]

In addition, as mentioned in our data request response under Index 16691, PG&E worked with Mosaic[10] (a consultant with expertise in project scoping, coordination and planning in the energy and utility industry) in 2018 to determine if certain ILI OQs were necessary. PG&E evaluated creating OQs with the following scopes: 1) to isolate pipeline barrels, relieving pressure, and pressurizing barrel; and 2) loading or unloading internal tools – ILI. This evaluation also looked at the existing OQs PG&E required at the time around tasks involved in ILI, listed in Figure 4 below. After benchmarking with other operators, PG&E determined that others in the industry utilized the same or similar OQ framework shown in Figure 4, which led to the conclusion that our existing OQ framework was sufficient for covered tasks completed during ILI.

[9] Please refer to PG&E's data request response to Index 16691.07 submitted to the SED on February 1, 2024
[10] https://themosaiccompany.com/

OQ	Description
OQ-0203	Pipe Squeezing Steel (3/4”-2”)
OQ-0215	Installation, Backfill, Compacting
OQ-0304	Atmospheric Corrosion on gas facilities
OQ-0305	Pipe inspection on gas facilities
OQ-0309	Internal Corrosion/monitor
OQ-0320	Protective Coating for Meters, Regulators, Valves, and Connected Piping
OQ-0403	Leak Test at Operating Pressure
OQ-0404	Press Test below 100psi (leak test)
OQ-0507	Damage Prevention during excavation
OQ-0601	Operate service tee / Save a valve - tapping & plugging equip. (3/4" to 2")
OQ-0612	Operate valve tee/pin-off - tapping & plugging equipment (1" to 2")
OQ-0701	Purging with Gas/ or Air
OQ-0703	Inert Purging
OQ-0704	Air Mover Operations
OQ-2217	Steel Pipe Joining: Flanged Joints
OQ-2218	Steel Pipe Joining: Threaded Joints

Figure 4. List of required OQs involved with ILI tasks

As mentioned in our response for NOPV #2, although PG&E’s procedure TD-4137P-03 did not provide guidance on how to recognize and react to pigging AOCs (e.g., stuck pigs), it was intentional because this guidance was already provided in TD-4810P-11. Having the same guidance in multiple procedures makes it challenging to manage version control and introduces the risk of having conflicting guidance when updates to our guidance documents are required. To reiterate, PG&E believes that the pigging AOC guidance provided in TD-4810P-11 provides our employees with a solid foundation to evaluate and remediate the commonly encountered pigging AOCs. However, to further strengthen the guidance on pigging AOCs, PG&E added supplemental guidance in the new TD-4139S guidance document and developed an accompanying tailboard to ensure that our employees are aware of this supplemental guidance and receive the proper training.

PG&E recognizes the significance of the Calistoga incident and aspires to advance our processes to keep our employees, partners and the public safe. Since the incident, PG&E implemented a safety standdown on out-of-service pigging for our employees, and has been leveraging experienced ILI contractors and vendors who hold the appropriate interim OQs for their respective tasks (see below):

- OQ-1631, “Launching and/or Receiving Internal Devices (Pigs) With a Temporary Launcher and/or Receiver for Lines Out of Service”
- OQ-1641, “Launching or Receiving Internal Devices (Pigs) Using Traps”
- OQ-5921, “Launch and Receive Distribution Pipeline Pigs”

In addition, PG&E developed a new in-service pigging OQ for our internal employees, OQ-1628, “Launching and/or Receiving Internal Devices using Natural Gas” to ensure that pigging operations will be a covered task moving forward. The written exam for this new OQ was created in June 2023. PG&E also developed a new training course GAS-0865WBT, “Pigging Overview” as a prerequisite for taking the written exam for OQ-1628 and implemented this training on September 1, 2023. PG&E also constructed an ILI test loop at our Winters Training Facility to provide hands-on training for in-service pigging. The construction of this test loop was completed in April 2024 with a memorial dedicated to [redacted] (see Figures 5 and 6).

Figure 5. New test loop at Winters for in-service pigging training and memorial

Figure 6. New test loop at Winters for in-service pigging training

Sincerely,

Kristina Castrence
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Gas Engineering
Pacific Gas and Electric Company

cc: Mohammad Ali, SED
Matt Epuna, SED

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[redacted], PG&E