STATE OF CALIFORNIA Gavin Newsom, *Governor*

PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

October 11, 2019 GI-2019-04-PGE-29-08

Ms. Christine Cowsert, VP, Gas Asset Management and System Operations
Pacific Gas and Electric Company
6121 Bollinger Canyon Road
San Ramon, CA 94583

SUBJECT: General Order 112-F Inspection of PG&E's Transmission Integrity Management Program – In-Line-Inspection Focused

Dear Ms. Cowsert:

The Safety and Enforcement Division (SED) of the California Public Utilities Commission (CPUC) reviewed Pacific Gas and Electric Company's (PG&E) response letter dated August 8, 2019 that addressed the findings identified during the General Order (GO) 112-F Transmission Integrity Management Program (TIMP) inspection from April 29 –May 10, 2019.

A summary of the inspection findings documented by SED, PG&E's response to our findings, and SED's evaluation of PG&E's response taken for each finding are outlined for each violation and concern in this letter.

This letter serves as the official closure of the 2019 Inspection of PG&E's TIMP –ILI Focused.

If you have any questions, please contact Paul Penney at (415) 703-1817 or by email at: Paul.Penney@cpuc.ca.gov.

Sincerely,

Dennis Lee

Dennis Lee, P.E.
Program and Project Supervisor
Gas Safety and Reliability Branch
Safety and Enforcement Division

Enclosure: Closure Letter

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Closure Letter

Date of Transmittal: 07/11/2019

Dates of Inspection: May 6-10, 2019 and May 13-17, 2019

Operator: PACIFIC GAS & ELECTRIC CO

Operator ID: 15007 (primary)

Inspection Systems: System Wide

Assets (Unit IDs): Main Office (Specialized Inspections) (86283)

System Type: GT

Inspection Name: (2019) PG&E TIMP Audit - ILI Focused

Lead Inspector: Paul Penney

Operator Representative: Anthony Kwan and other PG&E staff identified in the sign in roster.

Unsatisfactory Results

Assessment and Repair : In-Line Inspection (Smart Pigs) (AR.IL)

1. Question Text: Do records demonstrate that personnel who conduct assessments or review assessment results are qualified per the process requirements?

References: 192.947(g) (192.915(a), 192.915(b))

Assets Covered: Main Office (Specialized Inspections) (86283 (29))

Issue Summary: All of Joseph Yu and Chris Wehling's training records under TD 4180S-01, Attachment 1, were not available at the end of the audit. PG&E was still trying to find the appropriate training records for each ILI Engineer at the end of the audit.

On 7-3-19, PG&E provided a preliminary written response along with a table showing training dates as follows:

Please refer to the table below for the 2015-2018 TD-4810P-11 – In-line Inspection Procedure training dates of Joseph Yu, David Slane, and Chris Wehling. PG&E is still compiling documentation to support the dates listed below.

Year	Dates of Training
2015	November 5, 2015
2016	Unknown*
2017	September 6, 2017
2018	December 10, 2018

*PG&E is still researching 2016 training dates.

In lieu of finding and providing the training records, PG&E is in violation of 192.947(g) and 192.915(b).

PG&E Response:

Hard copy rosters, SharePoint records, and PG&E academy transcripts provide the recorded dates of procedural training for Chris Wehling, David Slane, and Joseph Yu between the years 2015 through 2018.

Some trainings were not properly documented and stored in easily found and accessible locations, these instances are called out in the tables of "***Attachment 1 - ILI Training.pdf*** " as "Not documented". PG&E understands that the ILI personnel did attend and complete required annual training, but this is not reflected in written records which is due to inconsistent systems of documentation. ILI personnel read and reviewed the procedures on an on-going basis and are qualified to conduct assessments and review assessment results.

On 7-3-19, PG&E provided a preliminary written response along with a table showing training dates as follows:

Professional certifications, industry training, and industry conferences that Chris Wehling, David Slane and Joseph Yu have completed or attended are also listed in the attachment. While not procedurally required, these additional certifications and trainings add to their overall expertise to perform integrity management work.

The Transmission Integrity Management Program (TIMP) has built in quality control checkpoints to ensure proper adherence to TIMP procedures. Specific to the ILI program, TD-4810P-11, "In-Line Inspection", requires Forms A through M for each ILI assessment. These Forms have required levels of approval by the ILI Engineer, ILI Supervisor and ILI Manager. In addition, any major or minor changes as defined by TD-4810P-21, "Management of Change", are reviewed and approved through a defined workflow through the ILI Supervisor, TIMP Managers and the TIMP Director. In each TIMP process, multiple qualified personnel review and approve documents used to make assessment related decisions. In 2019, TIMP is focusing on an effort to standardize the recording and documentation of all procedural training in PG&E's MyLearning system.

SED's Conclusion:

PG&E's response adequately addresses this violation of 192.947.

2. Question Text Do records demonstrate that the assessment methods shown in the baseline and/or continual assessment plan were appropriate for the pipeline specific integrity threats?

References 192.947(g) (192.919(b), 192.921(a), 192.937(c))

Assets Covered Main Office (Specialized Inspections) (86283 (29))

Issue Summary

During the audit, GSRB staff discussed with PG&E the issue of ILI tools not being able to interrogate the entire pipe length (measure pipe wall loss, etc.) within an HCA due to the limitations of the tool. This includes both non-traditional ILI and traditional ILI tools. GSRB staff understands this issue to be related to the MFL sensors moving away from the pipe wall during angle changes of the line pipe.

After careful consideration of PG&E's comments during the audit, GSRB staff still believes that if a portion of the HCA is not assessed via the ILI tool because of the limitations of the tool, another assessment technique must be used to assess the missed portion of the pipe. This is fundamental to a continual process of evaluation and assessment outlined 192.937 for all threats identified for a particular covered segment.

Because of the issue identified above, PG&E is in violation of 192.937(c) for not assessing the entire portion of the HCA segments where portions of segments were skipped. Further, PG&E must assess all portions of pipeline segments that were not assessed during the last ILI assessment because of the limitations of the non-traditional or traditional tool.

PG&E Response:

Although ILI is the preferred method for conducting integrity assessments, it still has limitations and it is widely recognized across the gas transmission industry (regulators, operators and ILI vendors) that obtaining 100% inspection via ILI is presently an unachievable goal. Numerous issues can contribute to loss of or degradation of ILI data and thus specific thresholds as to what constitutes an acceptable ILI run must be set by operators and agreed to by their ILI vendors in order for the inspection business to operate. PG&E's goal is to obtain the most comprehensive ILI run possible for each ILI project, given the limitations of the ILI tools as well as PG&E's pipeline design and operational limitations.

PG&E has established a threshold of maximum data loss of 2% of overall mileage and 1% of mileage within an HCA within the Traditional ILI Specification 15001 as-well-as our Non-Traditional ILI Specification 16001, however these values are designed to set a high bar for our ILI contractors and are not always achievable. Ultimately, the decision as to what constitutes an acceptable ILI run is decided by the assigned PG&E ILI Engineer in consultation with the ILI Technical and Supervisory leadership. The fact that data on a small percentage of a given pipeline's mileage was not obtained due to ILI tool's operational limitations or sensor loss or malfunction does not show that the overall ILI run was unacceptable nor that the pipeline was not adequately inspected. In many cases this data loss is of transient nature, may be able to be compensated for by using data from adjacent sensors or the data may be compromised by the tool exceeding its velocity range parameters, but is still usable and gradable. Thus, it is standard industry practice to accept ILI runs which have less than

100% data for the full length of the inspection, as this assessment method still far outperforms presently available alternatives.

In the case of PG&E's NT-ILI projects reviewed as part of the most recent audit, data loss in specific features varied from 0% to 4.2% of overall project mileage, which constitutes "minor" data loss in the overall assessment process and thus was accepted by PG&E. Additionally, PG&E asserts that data collected by the audited MFL inspections pertaining to the condition of a pipeline segment (for relevant threats) is still equivalent to or greater than that obtained by other approved Integrity Management assessment methods and that the use of ILI greatly reduces risk while meeting all CFR 49 Part 192 Subpart "O" requirements.

CFR 192.937(c) states that an operator must select an assessment method that is appropriate for the given threat(s) identified for a specific segment. 192.937(c)(1) states internal inspection tools capable of detecting corrosion and any other threats to which the segment is susceptible is a valid assessment method, provided the operator follow guidance provided in ASME B31.8S in selecting the appropriate tool. B31.8S, section 6.2.1(b) states that for internal and external corrosion threats, high resolution Magnetic Flux Leakage (MFL) tools are appropriate for assessment. CFR 192.919(b) states the integrity assessment method an operator uses must be based on the threats identified to the covered segment. More than one method may be required to address all the threats to the covered pipeline segment.

PG&E has adhered to the requirements described above in Code as high resolution MFL is an approved assessment for both External Corrosion and Internal Corrosion and thus PG&E chose an appropriate assessment method for all ILI projects reviewed by the CPUC during the audit process. Note that in cases where additional threats exist in a covered segment, PG&E does utilize additional assessment methodologies.

PG&E disagrees that the specific ILI runs reviewed by SED did not adequately inspect the applicable pipelines. Neither CFR 49 Part 192 nor ASME B31.8S-2004 outlines ANY minimum requirements with regard to data collection to consider a segment to be assessed by a specific assessment method and thus the referenced code section is not applicable. From a practical standpoint, ILI is considered the most comprehensive inspection tool of the approved assessment methods provided by CFR 49 Part 192 Subpart "O" and has been strongly endorsed by the NTSB as well as by PHMSA as the preferred method of assessment for many pipeline threats. These threats include External Corrosion and Internal Corrosion, mostly due to its inherent ability to accurately detect and size metal loss that can then be subsequently directly examined and repaired by an operator. This perspective is further reinforced in the PHMSA NPRM "Mega Rule" that is scheduled for publication later this year where ILI is proposed to be the required inspection technology if the line is deemed piggable.

For these reasons, PG&E strongly disagrees with SED's assessment that the company is in violation of federal code in this regard, both in terms of compliance with the referenced CFR section as well as the quality and completeness of the inspections performed by both Traditional and Non-Traditional ILI tools and processes.

SED's Conclusion:

SED staff should have been more specific about what type of data loss was being referenced in the original Notice of Probable Violation (NOPV) from above. SED staff was referencing locations along the pipeline where pipeline segments change direction and create some angle where the ILI sensors move away from the pipe wall. For example, this can occur when a pipeline goes under a railroad track or roadway. This can also occur when a pipeline changes horizontal direction for some reason. In these cases, the ILI tool will always miss being able to detect metal loss indications in the pipe due to the MFL sensors moving away from the pipe wall (unless ILI vendors are able overcome this technical issue).

SED staff believes that the specifics of where these angular changes occur can necessitate another assessment technique be used to supplement the ILI run. For example, a pipeline angles downward under a railroad track and the location has been identified by PG&E for the internal corrosion threat. If the location is in an HCA, another technique such as direct examination or Guided Wave Ultrasonic Technology (GWUT) must be used to supplement the ILI run, especially if integration of other data suggests there is some evidence internal corrosion and/or liquids internal to the pipeline.

For example, a non-traditional ILI tool finds internal corrosion adjacent to the missed angle, and on-board cameras observe liquids at the low point. Even if the Pf/MAOP of the internal corrosion indications are below what is necessary for repair before the next integrity assessment, the missed location should be inspected with either direct examination or GWUT.

Comments on PG&E's Response:

SED staff has reviewed PG&E's response to the NOPV letter and has the following comments. SED staff agrees with much of what PG&E said in its response to the Notice of Probable Violation (NOPV), although not everything.

Paragraph 1:

Regarding paragraph one, SED staff understands that there are numerous issues that can cause a loss of data during an ILI run and result in less than 100% coverage. Even if PG&E were to attempt to decrease the percentage of uncovered inspection by doing two high resolution MFL runs of the same pipeline, there is no guarantee that some of the same issues (such as sensor malfunction) that occurred on the first run would not occur on the second run. PG&E's goal of obtaining the most comprehensive inspection possible for each ILI run is a laudable goal.

Paragraph 2:

In paragraph 2 of the response, PG&E makes the point:

…The fact that data on a small percentage of a given pipeline's mileage was not obtained due to ILI tool's operational limitations or sensor loss or malfunction does not show that the overall ILI run was unacceptable nor that the pipeline was not adequately inspected. In many cases this data loss is of transient nature, may be able to be compensated for by using data from adjacent sensors or the data may be compromised by the tool exceeding its velocity range parameters, but is still usable and gradable. Thus, it is standard industry practice to accept ILI runs which have less than 100% data for the full length of the inspection, as this assessment method still far outperforms presently available alternatives.

SED staff agrees and accepts that achieving 100% coverage is currently not possible and that this assessment technique outperforms all other assessment techniques in terms of data collected on the condition of the pipe.

However, SED staff believes there is a distinction to be made between operational limitations and sensor loss or malfunctions. Operational limitations, such as when a sensor moves away from a pipe wall because of bends or other features in the pipeline cover a small amount of footage; thus, these locations can be inspected via direct examination or GWUT. Further, this does not mean that PG&E can discount the footage that was not inspected via the NT-ILI tool, especially in cases where there is clearly an elevated risk because of subsequent data integration.

For example, if the NT-ILI data shows there is an elevated risk of external corrosion due to interference currents from a mass transit system, which is then confirmed by direct examinations, and this corrosion is due to interference currents in the vicinity of the bend feature, PG&E must examine that bend feature through the use of some other assessment technique such as direct examination or GWUT; this is a far better alternative than simply not examining the feature.

Paragraph 3:

Regarding paragraph three, PG&E stated that of the NT-ILI projects reviewed, the data loss due to specific features ranged from 0% to 4.2%, and PG&E considers this to be minor data loss. SED staff agrees that this is relatively minor when compared to the total footage examined by the ILI tool.

PG&E goes on to say:

…Additionally, PG&E asserts that data collected by the audited MFL inspections pertaining to the condition of a pipeline segment (for relevant threats) is still equivalent to or greater than that obtained by other approved Integrity Management assessment methods and that the use of ILI greatly reduces risk while meeting all CFR 49 Part 192 Subpart "O" requirements.

SED staff agrees with the section highlighted in red that ILI equivalent to or greater than other integrity assessment techniques and greatly reduces risk. But SED staff does not agree with the underlined part of the quote that the inspection meets all CFR Part 192 Subpart "O" requirements. It is fundamental to the integrity assessment process that all HCA segment are assessed for the applicable threats.

Paragraph 4, 5 and 6:

Regarding paragraph 7, PG&E stated:

PG&E disagrees that the specific ILI runs reviewed by SED did not adequately inspect the applicable pipelines. Neither CFR 49 Part 192 nor ASME B31.8S-2004 outlines ANY minimum requirements with regard to data collection to consider a segment to be assessed by a specific assessment method and thus the referenced code section is not applicable…

SED finds the quoted section to be a specious argument, and strongly disagrees with it. It is fundamental to the Integrity assessment process that all the footage be integrity assessed. In fact, PG&E has gone to great lengths to ensure all footage has been properly assessed for the applicable threats as demonstrated by a PG&E self-identified violation from March 3, 2015.[1]

In a follow up report to the original report submitted to the GSRB on August 5, 2016, PG&E provided information regarding fifteen assessment gaps covering from four to 885 feet. PG&E identified the reasons for the missed assessment footage as: *"These items have been identified due to program improvements, missing inspection documentation, or assessments stopping short of covering an entire pipeline section."* This is equivalent to PG&E missing certain portions of an ILI run due to feature that the ILI tool did not cover.

To summarize, for the above reasons, SED still believes PG&E is in violation of 192.937(c).
As noted in the original NOPV from above, PG&E must assess all portions of pipeline segments (i.e., pipeline features including elbows, Tees, etc.) that were not assessed during the last ILI assessment because of the limitations of the non-traditional or traditional tool and where PG&E does not have a written rationale for why the feature does not need integrity assessment. SED is willing to discuss this issue with PG&E management and ILI staff further.

Concerns

Assessment and Repair : In-Line Inspection (Smart Pigs) (AR.IL)

1. Question Text: Does the process for validating ILI results ensure that accurate integrity assessment results are obtained?

References: 192.921(a)(1) (192.937(c))

Assets Covered: Main Office (Specialized Inspections) (86283 (29))

Issue Summary: PG&E has incorporated API 1163 into TD-4810P-11, page 26, Section 6.a (ILI Run Validation); this requirement became effective on 9/18/17.

CONCERN:

1. PG&E should create a validation form to summarize validation efforts. This will ensure a more easily auditable trail and meet compliance with 192.947(g). As noted in PG&E's current ILI standard, TD-4810P-11, page 26 of 43, *"It is PG&E's goal to validate all ILI vendor reports per API 1163 (April 2013 Second Edition) requirements to the highest level that is practical."* A form will make clear whether API 1163 was used, and if not, how ILI data was validated. A validation form will also make clear what level of validation is used (i.e., Level 1, 2 or 3).

PG&E Response:

PG&E agrees with SED's recommendation to create a specific ILI Form which summarizes the validation efforts employed on a given ILI project. This form will be created, published and become effective upon issuance of an updated version of TD-4810P-11. PG&E has created ECTS Task #526324 to track this to completion.

SED's Conclusion:

[1] This self-report was entitled "PUC Resolution ALJ-274 Self-Identified Non-Compliance Notification Missed Transmission Integrity Reassessments on Line 153 and Line 153-2".

PG&E's response adequately addresses this concern.

2. Question Text Is the process for ILI survey acceptance criteria adequate to assure an effective assessment?

References 192.921(a)

Assets Covered Main Office (Specialized Inspections) (86283 (29))

Issue Summary This item is covered in TD-4810P-11, Section 5.5.7 (Verification of ILI Quality). The section also say that the minimum requirements shall meet the requirements in API 1163, Section 7 for a system operational verification. This is covered in Form L - ILI Run Acceptance, which both PG&E and the vendor are required to sign.

NOTE: Section 5.5.7 states: This verification shall meet or exceed the requirements in API 1163 for operational verification.

CONCERN:

Form L does not appear to capture sufficient information to meet the requirements of API 1163 Section 7 for operational verification. Thus it is not clear that PG&E is meeting or exceeding the requirements of API 1163 as their procedure states in cases where PG&E uses API 1163. GSRB staff recommends that PG&E update Form L.

PG&E Response:

PG&E agrees with SED in that the existing Form L does not provide adequate documentation that all requirements of API 1163, Section 7 are being met for each ILI run. PG&E will update TD-4810P-11 to require that a specific check list or form are completed that verifies that the applicable API 1163 requirements are being met. This update to TD-4810P-11 will be created, published and become effective in the next revision. PG&E has created ECTS Task #526324 to track this to completion.

SED's Conclusion:

PG&E's response adequately addresses this concern.

3. Question Text Do records demonstrate that required actions are being taken to address significant corrosion threats identified during in-line inspections?

References 192.933 (192.917(e)(5))

Assets Covered Main Office (Specialized Inspections) (86283 (29))

Issue Summary PG&E staff stated that for ILI runs, this section of code [192.917(e)(5)] was interpreted to mean similar covered and non-covered segments along the same route. If PG&E has this interpretation, then the language should be added to Section 12.5 for ILI runs.

PG&E Response:

PG&E will update TIMP guidance documents including TD-4810S Section 12.5 to clarify how "similar covered and non-covered" segments are identified. These guidance documents changes will be completed in the next revisions. PG&E has created ECTS Task #526339 to track this to completion.

SED's Conclusion:

PG&E's response adequately addresses this concern.

Assessment and Repair : Repair Criteria (AR.RC)

4. Question Text Does the Integrity Management Plan and/or maintenance processes include all of the actions that must be taken to address integrity issues in accordance with 192.933?

References 192.933(a) (192.933(c), 192.933(d))

Assets Covered Main Office (Specialized Inspections) (86283 (29))

Issue Summary TD-4810P-11, While reviewing TD-4810P-11, Table 1, SED staff noted that scheduled one-year conditions includes conditions under which strain values become a one-year condition: 6% strain on the pipe body; and 4% on pipe that effects ductile girth welds or seam welds.

RECOMMENDATION #1: SED staff recommends putting a footnote in TD-4810P-11, Table 1 defining critical strain along with the source of the definition (i.e., B31.8)

RECOMMENDATION #2: Evaluate the need to provide more guidance on what constitutes "critical strain" for all pipeline materials properties in PG&E's system.

PG&E Response:

Recommendation #1: PG&E agrees with SED to add information to TD-4810P-11, defining critical strain and to include the source of the definition. Since this may require several sentences, this will likely be included in the "Definitions" section of this procedure and will be updated and become effective in the next revision.

Recommendations #2: PG&E agrees with SED that additional guidance should be provided in TD-4810P-11 regarding what constitutes "critical strain" for various pipelines within PG&E's gas transmission system. This guidance will be incorporated into TD-4810P-11 and become effective in the next revision.

PG&E has created ECTS Task #526324 to track this to completion.

SED's Conclusion:

PG&E's response adequately addresses this concern.

Integrity Management : Quality Assurance (IM.QA)

5. Question Text Does the process include requirements that non-mandatory requirements (e.g., "should" statements) from industry standards or other documents invoked by Subpart O (e.g., ASME B31.8S-2004 and NACE SP0502-2010) be addressed by an appropriate approach?

References 192.7(a)

Assets Covered Main Office (Specialized Inspections) (86283 (29))

Issue Summary **RECOMMENDATION:**

PG&E should add a footnote or addition to the definition of "should" to incorporate FAQ 244. PG&E showed language in the DA procedure that meets the intent of this recommendation. Therefore, please confirm the language has been added.

PG&E Response:

PG&E agrees with SED and will update the definition of “should” in TD-4810P-11 to reflect this requirement. This change will become effective in the next document revision. PG&E has created ECTS Task #526324 to track this to completion.

SED’s Conclusion:

PG&E’s response adequately addresses this concern.