

PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298



October 7, 2019

GI-2019-07-PGE-76

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 Bay Area South Transmission Area

Dear Ms. Cowsert:

On behalf of the Safety and Enforcement Division (SED) of the California Public Utilities Commission, Paul Penney, Angel Garcia, Dmitriy Lysak, Joel Tran, Alan Wehrman and Yi Yang conducted a General Order 112-F inspection of Pacific Gas & Electric Company's (PG&E) Bay Area South Transmission area the weeks of July 29 - August 2, 2019 and August 5-9, 2019. The inspection included a review of records related to PG&E's Bay Area South transmission system and field observations of various facilities in the area.

SED's findings are noted in the Post-Inspection Written Findings (Summary) which is enclosed with this letter. The Summary reflects only those records and field observations that SED reviewed during the inspection.

Within 30 days of your receipt of this letter, please provide a written response indicating the measures taken by PG&E to address the violations, concerns and recommendations noted in the Summary.

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

Sincerely,

A handwritten signature in blue ink that reads "Dennis Lee".

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

Enclosure: Post-Inspection Written Findings

cc: Susie Richmond, PG&E,
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Post-Inspection Written Findings

Date of Transmittal: 08/09/2019

Dates of Inspection: 7-29-19 to 8-9-19

Operator: PACIFIC GAS & ELECTRIC CO

Operator ID: 15007 (primary)

Inspection Systems: PG&E Bay Area South Transmission System

Assets (Unit IDs): Bay Area South Transmission Assets, Southern Region (); Bay Area South Transmission Assets, Northern Region ()

System Type: GT

Inspection Name: PG&E Bay Area South Gas Transmission Audit

Lead Inspector: Paul Penney

Operator Representative: Mike Lang and other PG&E staff identified on the sign in roster

Unsatisfactory Results

Maintenance and Operations : Gas Pipeline Operations (MO.GO)

Question Text Are construction records, maps and operating history available to appropriate operating personnel?

References 192.605(a) (192.605(b)(3))

Assets Covered Bay Area South Transmission Assets, Southern Region (South Bay South),
Bay Area South Transmission Assets, Northern Region (South Bay North)

Issue Summary **Violations:**

Holister:

Three check valves in the Rustic & Sally DFM operating diagram do not have designated numbers. According to PG&E's valve and regulator naming convention procedure TD-4460P-10 3.1a., "all transmission line mainline valves must be numbered by the milepost from the original beginning of the line". Those valves were removed in May 2019; however, the operating diagram has not shown the identification numbers since 2001.

PG&E did not follow its own procedure of naming the valves per TD-4460P-10; therefore PG&E is in violation of 192.605(a).

San Jose:

At Zanker Rd Station, SED found that the operating diagram at the station was outdated. The newest revision is Rev.16 but the station had Rev.10 that was dated in 1997. The tags for the valves and the configuration of the station were different with the on-site station diagram (the station had inlet and outlet valves tagged V1 and V2, but the diagram indicated them as V4 and V7, and the diagram did not have the inlet filter). According to PG&E reg station maintenance procedure TD-4540P-01, maintenance

personnel need to “verify all major valves and components are properly tagged AND that tag numbers match station the diagram”. PG&E failed to ensure the accuracy of the valve tags while performing their previous maintenance work. The tags were fixed during the inspection and the station diagram was replaced with the updated one.

PG&E did not follow their procedure of station maintenance TD-4540P-01, therefore in violation of 192.605(a).

Concerns:

Central Coast:

1. The operating diagram showed that the outlet MAOP at DRJ-66 Watsonville -Tie Airport & Chappell station is 303 psi, but in the data sheet, the outlet pressure is 300 psi. The data sheet did not match the information in the operation diagram. PG&E has confirmed that the downstream pressure is 303 psi and updated the data sheet for the station.
2. The 8th and 1st regulator station had a set pressure of 290 psi on the data sheet, but SED found that the pressure was left at 292 psi in 2016 and 293 psi in 2019. When asked for explanation, PG&E responded in BA-S#86 that the 293 psig was the suggested normal operating pressure and the station data sheet was updated with the 293 psig regulator set point.
3. SED requested a copy of the Chem Lime Co regulator station operating diagram in BA-S#81, and the diagram showed that the outlet MAOP of the station was 54 psi. The station had a regulator set pressure of 54 psi and monitor set pressure of 58 psi, and it did not have the MAOP information. SED requested explanation and PG&E responded in BA-S#87 that the outlet MAOP was 60 psi and they updated the operating diagram and data sheet.

San Jose:

Calpine Gilroy 1350 Station’s outlet MAOP was 333 psi and the data sheet showed that the running regulator and monitor set points were 328 psi and 333 psi. However, maintenance record shows that the set pressure for the running regulator and monitor were set at 333 psi and 340 psi for the year 2014 – 2018. PG&E’s explanation was that the downstream power plant needed high pressure and the engineer adjusted the set pressure to meet the capacity requirements, and they would update the datasheet. During the field visit of the station, PG&E marked the pressure for working regulator and monitor as 328# and 333# on the valve tag according to the old data sheet set points. Later PG&E engineer verified that the downstream MAOP was 400 psi and he updated the data sheet and operating diagram (BA-S#122).

PG&E did not update the station data sheet after they made change to the set points of the working regulator and monitor, causing inconsistency between the data sheet and the maintenance record. This may cause **confusion for maintenance personnel. Therefore, SED recommends PG&E review and update its system information promptly after any change have been made to the system.**

Time-Dependent Threats : Atmospheric Corrosion (TD.ATM)

Question Text Do records document inspection of aboveground pipe for atmospheric corrosion?

References 192.491(c) (192.481(a), 192.481(b), 192.481(c))

Assets Covered Bay Area South Transmission Assets, Northern Region (South Bay North)

Issue Summary: PG&E did not perform required atmospheric corrosion inspections prior to 2018 for the following spans:

43188019 - 0826-01, MP 0.11-0.11, Install Date 8/5/1982
43188014 - 0813-13, MP 0.51-0.54, Install Date 3/25/1977
43188020 - 0832-01, MP 2.51-2.56, Install Date 11/1/1999
43188018 - 0824-02, MP 0.65-0.68, Install Date 9/22/1981

192.481(a) requires that an operator inspect each pipeline or portion of pipeline that is exposed to the atmosphere for evidence of atmospheric corrosion at least once every 3 calendar years, but with intervals not exceeding 39 months for onshore pipelines.

Data Request 110 was related to this issue.

PG&E identified these spans under their corrective action program and found that they were not in the maintenance plan. They have since been added to the maintenance plan and inspected in 2018/2019.

Assets Covered:

Issue Summary Hollister

Span 41452950:

During the inspection on 10/16/2015, pitting was observed at the east air-to-soil transition. The inspection form states, "If corrosion pitting or mechanical damage is observed, contact the local supervisor and corrosion engineering as soon as possible. Record corrective actions taken, including contacting other parties."

During the subsequent inspection on 9/24/18, pitting was observed at both transitions. This demonstrates that no corrective action was taken following the 2015 inspection.

SED requested more information on BA-S#76. Per PG&E's response, OCW 115019680 was opened as a result of the 2018 inspection and is pending. This span is part of the Corrosion Engineering Span Remediation Program. The plan was to complete the work in 2017, but the span has not been remediated yet due to permitting issues (Permit from California Department of Fish and Wildlife, State).

49 CFR §192.481(c) states, in part:

If atmospheric corrosion is found during an inspection, the operator must provide protection against the corrosion as required by §192.479.

While PG&E did not have an internal requirement in 2015 to remediate atmospheric corrosion within a specified timeframe, pitting at the air-to-soil transition presents a significant corrosion risk, and PG&E's failure to take action for nearly four years presented an avoidable risk to the pipeline.

Santa Cruz

Span 43188069:

During the inspection on 2/8/18, a significant amount of missing coating was discovered. This span sits partially in a creek, which exposes it to a highly corrosive environment. There was no previous inspection record in the binder.

Span 44467409 has the exact same concerns.

On BA-S#82, SED requested the previous inspection records. Per PG&E's response, these spans were found in the field in Feb 2018 per CAP 114152290. They were assigned to the corrosion team to investigate. Correctives 114326641 and 114328076 were created as a result of the 2018 inspection and will be done by 2021.

49 CFR §192.481(a) states, in part:

Each operator must inspect each pipeline or portion of pipeline that is exposed to the atmosphere for evidence of atmospheric corrosion, as follows:

If the pipeline is located:	Then the frequency of inspection is:
Onshore	At least once every 3 calendar years, but with intervals not exceeding 39 months
Offshore	At least once each calendar year, but with intervals not exceeding 15 months

PG&E did not inspect these spans at least once every 3 calendar years prior to 2018, and is therefore in violation of 49 CFR §192.481

Time-Dependent Threats: External Corrosion - Cathodic Protection (TD.CP)

Question Text Do records adequately document electrical isolation of each buried or submerged pipeline from other metallic structures unless they electrically interconnect and cathodically protect the pipeline and the other structures as a single unit?

References 192.491(c) (192.467(a), 192.467(b), 192.467(c), 192.467(d), 192.467(e))

Assets Covered Bay Area South Transmission Assets, Northern Region (South Bay North)

Issue Summary: San Jose

Item 1 – Violation

Casing 41389955: After 2016, this casing had no reads, and was marked as "RPO CRIT." RPO stands for "Record Purposes Only" and items marked RPO are typically not maintained. However, a casing that has not been removed should not be marked RPO, since there will always be the possibility of contact with the pipeline. SED asked for additional details on BA-S#97. Per PG&E's response, this casing was changed to RPO status in August 2017 under notification 112045345. On 7/23/2019, it was discovered that the casing is still installed and should be maintained and was put back in service. 49 CFR §192.605(a) states, in part:

Each operator shall prepare and follow for each pipeline, a manual of written procedures for conducting operations and maintenance activities and for emergency response.

TD-4181P-601 requires annual testing of casings to determine if there is a possible contact between the pipeline and casing. PG&E failed to perform this annual testing in 2017 and 2018.

In order to mitigate this issue in the future, SED recommends that PG&E review all casings within its system marked "RPO" and remove this status from any casings that are physically still in place around a gas-carrying pipeline.

Item 2 – Violation

Several casings were found to have been monitored only partially per the requirements outlined in TD-4181P-601 "Testing Procedures for Pipe Casings." Per this procedure, there are six configurations casings fall into. In configurations A and B, the technician must perform a pipe-to-soil and casing-to-soil test. In configurations C and D, the technician must perform an interrupted casing-to-soil test. In configurations E and F, the technician must perform ACCA and ACVG tests.

In 2016, 4 casings had only a casing-to-soil read, but were missing either a pipe-to-soil read, or interrupted casing reads:

41389547 (ETS, POTENTIAL, CASING, 0804-03. MP 2.85)
41389554 (ETS, POTENTIAL, CASING, 0804-03. MP 3.29)
42730281 (ETS, CASING, 0804-03 MP 2.360)
42569623 (ETS, POTENTIAL, CASING, GCUST8310 MP.038)

In 2018, 12 casings had only a casing-to-soil read, but were missing either a pipe-to-soil read, or interrupted casing reads:

41389847 (ETS, CASING, 0806-01. MP 0.22)
41420074 (ETS, CASING, DREG4129. MP 0.00)
41389635 (ETS, POTENTIAL, CASING, 0804-11. MP 0.22)
41389533 (ETS, POTENTIAL, CASING, 0804-03. MP 1.80)
41389700 (ETS, POTENTIAL, CASING, 0805-01. MP 0.75)
41389707 (ETS, POTENTIAL, CASING, 0805-01. MP 0.92)
41389714 (ETS, POTENTIAL, CASING, 0805-01. MP 1.02)
41389724 (ETS, POTENTIAL, CASING, 0805-01. MP 1.10)
41420039 (ETS, POTENTIAL, CASING DREG4181 MP 0.439)
43321188 (ETS, CASING, DFDS3529 (3586))
41392037 (ETS, POTENTIAL, CASING, 0833-01. MP 5.49)
41417809 (ETS, CASING, DFDS3529 (3586))

2 casings were missing either a pipe-to-soil read, or interrupted casing reads in both 2016 and 2018:
41389540 (ETS, POTENTIAL, CASING, 0804-03. MP 2.58)
41389568 (ETS, POTENTIAL, CASING, 0804-05. MP 0.43)

SED submitted a data request for a subset of these casings on BA-S#101 requesting an explanation for the partial reads, but no explanation could be provided.

With only a casing-to-soil read, there is not enough data captured to ensure the casing and the carrier pipe are not contacted. PG&E recognizes this and outlined the appropriate tests in TD-4181P-601. These tests were not performed or recorded in such a way as to ensure electrical isolation.

49 CFR §192.605(a) states, in part:

Each operator shall prepare and follow for each pipeline, a manual of written procedures for conducting operations and maintenance activities and for emergency response.

In the above 18 cases, PG&E failed to follow TD-4181P-601 and is therefore in violation of 49

CFR §192.605(a).

Item 3 – Concern

In 2018, three casings had an indication of electrolytic contact, but no successive notification was created.

41389905 (ETS, POTENTIAL, CASING, 0807-01. MP 0.27)

41390429 (ETS, POTENTIAL, CASING, 0813-13. MP 2.65)

41392030 (ETS, POTENTIAL, CASING, 0833-01. MP 0.63)

SED requested an explanation on BA-S#101. Per PG&E's response, the lack of notification may have been due to a logic issue in SAP, which is supposed to automatically trigger a notification when a casing test indicates a possible contact.

Successive measurements on these casings demonstrated no contact.

SED recommends PG&E review the SAP logic related to casings to ensure that any casing that demonstrates an indication of possible contact per TD-4181P-601 automatically has a notification generated to troubleshoot.

Concerns

Facilities and Storage : Valves (FS.VA)

Question Text Are transmission line valves maintained as required?

References 192.745(a) (192.745(b))

Assets Covered Bay Area South Transmission Assets, Northern Region (South Bay North)

Issue Summary While checking transmission valve operation in the field, PG&E found a valve where the grease fitting was found to be damaged. The GPOM technician said it should be replaced. The valve SAP Equipment number is 41345879. It's in Santa Clara and is designated as mainline valve, 0804-03, MP 2.2067.

Please provide a copy of the notification to correct this issue.

Maintenance and Operations : ROW Markers, Patrols, Leakage Survey and Monitoring (MO.RW)

Question Text Are line markers placed and maintained as required?

References 192.707(a) (192.707(b), 192.707(c), 192.707(d))

Assets Covered Bay Area South Transmission Assets, Southern Region (South Bay South)

Issue Summary Santa Cruz

Span 43165468: In the photos from the 11/9/17 atmospheric corrosion inspection, SED was unable to locate any line markers (there appeared to be no stickers on the pipeline nor any marker posts nearby). SED requested additional information on BA-S#82. PG&E was unable to confirm whether the span is properly marked, and opened notification #117725023 and PM #43911409 to investigate and install pipeline markers as necessary for this span.

Time-Dependent Threats : Atmospheric Corrosion (TD.ATM)

Question Text Is pipe that is exposed to atmospheric corrosion protected?

References 192.481(b) (192.481(c), 192.479(a), 192.479(b), 192.479(c))

Assets Covered Bay Area South Transmission Assets, Southern Region (South Bay South)

Issue Summary While going to Bloomfield station (H-73) in Gilroy to observe a valve operation, GSRB staff noted a soil-to-air interface at an above ground run of pipe at the interface was not tape coated. One end of the pipe run was tape coated, but the other end was not. In addition, the station had gravel around the soil-to-air

interface, thus making it hard to observe any corrosion related conditions at this interface.

PG&E indicated that it would investigate this issue. Please provide an update on what PG&E has found along with any photos taken.

Time-Dependent Threats : External Corrosion - CP Monitoring (TD.CPMONITOR)

Question Text Are methods used for taking CP monitoring readings that allow for the application of appropriate CP monitoring criteria?

References 192.465(a)

Assets Covered Bay Area South Transmission Assets, Southern Region (South Bay South)

Issue Summary SED found an issue with 2 coupon test stations in the Hollister area. The test stations did not have a circuit board and PG&E was unable to take reads at these locations.

Coupon Test Stations: 44337822 & 44337823

Data Request 91 asked for additional details on these stations. PG&E responded stating that the corrosion mechanic will troubleshoot the coupon test stations this week.

Question Text Are impressed current sources properly maintained and are they functioning properly?

References 192.465(b)

Assets Covered Bay Area South Transmission Assets, Southern Region (South Bay South)

Issue Summary [Salinas](#)

Rectifier 44629291 (rectifier #42): On 8/1/2019, SED observed that a shunt had been installed in series at the negative DC output terminal of the rectifier. SED requested additional information on BA-S#91.

PG&E's response: The shunt installed was a 0.01 Ohm shunt. The corrosion mechanic most likely installed the shunt to make the shunt calculation easier, by just needing to move the decimal point rather than a calculation. This is not a typical installation method and was therefore removed from the rectifier on 8/1/2019.

In subsequent discussion with PG&E Corrosion Engineering, the shunt was determined to be a Holloway RS shunt, rated for 6A. The rectifier output observed on 8/1 was 34.7V and 11.8A, which exceeds the current rating for this shunt. A higher rectifier output could potentially melt the shunt, shutting down the cathodic protection and posing a safety hazard to personnel.

PG&E will hold a "Five Minute Meeting" to alert all corrosion mechanics to look for unauthorized additional equipment such as this when performing annual rectifier maintenance. PG&E will also attempt to locate the individual who installed the shunt. SED recommends that individual be re-trained in the process to perform the shunt calculation.

Question Text Do records adequately document actions taken to correct any identified deficiencies in corrosion control?

References 192.491(c) (192.465(d))

Assets Covered Bay Area South Transmission Assets, Southern Region (South Bay South)

Issue Summary [Salinas](#)

Coupon test station (CTS) 44627461 had the following reads on 10/24/2018: ON read -856 mV; instant off -676 mV, native -814 mV. This does not meet compliance with any CP criteria listed in 49 CFR Part 192 Appendix D. No follow up notification was generated to troubleshoot this issue. SED asked for clarification on BA-S#69, and received the following response:

On 8/1/19, the following reads were taken: On -960 mV, Instant off -839 mV, native -795 mV. The coupon was turned off and a depolarized reading was taken on 8/2/19: On -1142 mV, instant off -970 mV, depolarized pipe -863 mV.

This meets the criteria of the 100-mV shift, however, this location should have been tested in this fashion

on 10/24/2018 when the reads did not meet compliance with CP criteria.

General

Of the 280 CTS readings in 2018, 85 recorded a native potential more negative than -600 mV. In seven cases, the native potential was more negative than the instant off potential. This suggests there is a lack of quality in native potential readings. SED requested more information on BA-S#69, but no concrete reason could be provided for these high native reads, other than that changes to the environment can affect the native potential.

On BA-S#71, SED requested PG&E Utility Bulletin 304, Attachment 1 ("Gas Construction and Maintenance Demonstration of Compliance with 100 mV Shift Criteria Using a Coupon Test Station"), which instructs technicians to take the difference between the instant off read and the native coupon, and use that to determine compliance with the 100 mV shift criterion. However, if there is a lack of quality in the native potential readings, this raises questions about the legitimacy of using these native coupons to determine compliance with the 100-mV shift criterion.

SED recommends PG&E consider changing the process as follows: Take an on read from the CP coupon. Take an instant off read from the coupon. Leave the coupon disconnected and allow the potential of the coupon to decay. If it decays by more than 100 mV, then compliance with the 100-mV shift criterion is demonstrated. During field observations, SED asked technicians to perform this test at five stations:

43143831: ON -1407, OFF -940, NATIVE -457, OFF 1 min -808
44648375: ON -1229, OFF -1154, NATIVE -831, OFF 4 min -1113
44667088: ON -1101, OFF -993, NATIVE -708, OFF 2 min -922
44662705: ON -1204, OFF -980, NATIVE -797, OFF 1 min -850
44647426: ON -1474, OFF -906, NATIVE -411, OFF 1 min -807

Based on these observations, SED recognizes that some CTS locations will require the coupon to remain off for a significant amount of time in order to verify compliance with the 100-mV shift requirement. However, at three of the five stations, it appears this test can be performed in under 2 minutes and would provide more confidence that the CP meets the 100 mV criteria.

Additionally, on BA-S#69, SED requested the logic in SAP that triggers a notification for CTS readings. Per PG&E's response, SAP will generate a notification if either of the following conditions is met:

- Differential Instant off Native < 100 mV
- Pipe-to-Soil Above -2500 mV and Instant off above -1200 mV

This logic does not appear to capture the case where the native is more negative than the Instant Off. SED recommends the logic in SAP be updated to trigger a notification any time the native potential is more negative than the instant off, since this indicates either a data entry error, a coupon wiring issue, or insufficient protection of the pipe.

Time-Dependent Threats : External Corrosion - Cathodic Protection (TD.CP)

Question Text Are measures performed to ensure electrical isolation of each buried or submerged pipeline from other metallic structures unless they electrically interconnect and cathodically protect the pipeline and the other structures as a single unit?

References 192.467(a) (192.467(b), 192.467(c), 192.467(d), 192.467(e))

Assets Covered Bay Area South Transmission Assets, Southern Region (South Bay South)

Issue Summary [Salinas](#)

Casing 41470869: On 8/2/2019, SED observed a reading at this casing: pipe-to-soil -1013 mV and casing-to-soil -821 mV. Per TD-4181P-601, a casing-to-soil reading more negative than -800 mV indicates a potential contact. On BA-S#91, SED asked if this casing was already on the contacted casing master list. Per PG&E's response, this casing was not on the list, however, previous reads since 2013 have not indicated a contact. The reads from the field observation on 8/2 were entered in SAP and PR 117720617 was opened as of 8/8/2019 to re-read/troubleshoot this casing.

Please provide the results of the re-read and indicate if any adjustments were made to the rectifier(s) to bring down the read.

Training and Qualification : OQ Protocol 9 (TQ.PROT9)

Question Text Verify the qualified individuals performed the observed covered tasks in accordance with the operator's processes or operator approved contractor processes.

References 192.801(a) (192.809(a))

Assets Covered Bay Area South Transmission Assets, Southern Region (South Bay South)

Issue Summary Salinas

Rectifier 44629291 (rectifier #42): On 8/1/2019, SED observed that a shunt had been installed in series at the negative DC output terminal of the rectifier. SED requested additional information on BA-S#91.

PG&E's response: The shunt installed was a 0.01 Ohm shunt. The corrosion mechanic most likely installed the shunt to make the shunt calculation easier, by just needing to move the decimal point rather than a calculation. This is not a typical installation method and was therefore removed from the rectifier on 8/1/2019.

PG&E will hold a "Five Minute Meeting" to alert all corrosion mechanics to look for unauthorized additional equipment such as this when performing annual rectifier maintenance. PG&E will also attempt to locate the individual who installed the shunt. SED recommends that individual be re-trained in the process to perform the shunt calculation.

Please indicate if the corrosion mechanic was found to still be doing corrosion related work and if so, whether additional training was conducted.