



Internal Corrosion Control: Annual Program Review

SUMMARY

This utility procedure describes the annual program review for internal corrosion control of the Pacific Gas and Electric Company (Company) gas pipelines.

Level of Use: Information Use

TARGET AUDIENCE

Corrosion engineers performing the internal corrosion control annual program review.

SAFETY

Compliance with this utility procedure reduces the risk of internal corrosion in transmission, gathering, storage, and distribution lines, which results in increased public and personnel safety. No specific safety concerns are associated with the use of this procedure by a user performing the internal corrosion control annual program review.

BEFORE YOU START

Corrosion personnel performing the annual program review must receive training from the appropriate subject matter expert (SME) corrosion engineer.

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PROCEDURE STEPS

1 General

- 1.1 Corrosion services reviews activities and data related to internal corrosion on an annual basis to assess the internal condition of the Company's gas transmission, gathering, storage, and distribution system.
- 1.2 Corrosion services incorporates applicable data from Risk Management Procedure RMP-16, "Threat Identification" as part of the review.

2 Review Internal Corrosion Related Failures

- 2.1 Identify the locations of any leaks or ruptures that have occurred due to internal corrosion in the previous year.
- 2.2 Identify results of failure analyses.

3 Review Evidence of Internal Corrosion

- 3.1 Review the results of in-line inspections, non-destructive testing, or visual inspections.
- 3.2 Identify the locations of internal indications or anomalies along with the extent and severity of corrosion.
- 3.3 Where visual inspections were performed, include the accompanying sample results.

4 Review Sampling and Monitoring Results

- 4.1 Identify locations where gas testing, liquid sampling, solid sampling, and corrosion rate monitoring were performed during the previous year for internal corrosion control purposes.
- 4.2 Compare the results from the previous year with historical results for the same locations.
- 4.3 Identify locations where testing results exceeded the corrosive threshold limits defined in Gas Utility Procedure TD-4186P-300, "Internal Corrosion Control: Corrosion Rate Monitoring."



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4.4 Identify liquid sampling, solid sampling, gas testing or coupon monitoring locations that need to be added or changed.

- Additions or changes may be based on the following:
 - Testing results
 - Internal corrosion related failure
 - Evidence of internal corrosion
 - Changes in operations
 - The need for additional information regarding the system

4.5 Identify locations where the frequency of corrosion testing needs to be changed.

5 Review Mitigation Strategy

5.1 Review the mitigation strategy from the previous year. Identify the following information, if applicable:

- Pigging frequency
- Volume of liquids and/or solids removed
- Types of chemical treatment (batch or continuous)
- Frequency, rate, or volume of chemical used
- Brand of chemical(s) used

5.2 Evaluate monitoring results to determine if corrosion is being mitigated effectively. See Gas Utility Procedure TD-4186P-300, "Internal Corrosion Control: Corrosion Rate Monitoring."



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- 5.3 Identify changes needed to the mitigation plan.
1. Changes may be based on monitoring results, internal corrosion failures, evidence of internal corrosion, or changes in system operation.
 2. Consideration may be given to reducing or eliminating mitigation activities if monitoring devices upstream of mitigation indicate that corrosive gas (or liquid) is no longer being transported.
 - IF mitigation activities are reduced or eliminated,

THEN continue monitoring for at least two consecutive monitoring periods to verify that corrosive conditions no longer exist. See Gas Utility Procedure TD-4186P-300, "Internal Corrosion Control: Corrosion Rate Monitoring."

6 Document Annual Review

- 6.1 Document the annual review process using Gas Utility Form TD-4186P-500-F01, "Internal Corrosion Control Annual Review."
- 6.2 Record information related to the internal corrosion mitigation plan for a specific pipeline on Gas Utility Form TD-4186P-400-F01, "Evaluation and Mitigation Plan for Internal Corrosion Assessment." Monitoring to be performed should also be contained in this plan.
- 6.3 Corrosion services maintains a copy of the annual review records.

END of Instructions



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DEFINITIONS

See Gas Utility Standard TD-4186S, "Internal Corrosion Control of Gas Facilities."

IMPLEMENTATION RESPONSIBILITIES

Corrosion services ensures all impacted personnel are aware of this utility procedure.

Supervisors communicate this procedure to personnel performing the internal corrosion control annual program review and ensure that personnel are trained to perform these tasks.

GOVERNING DOCUMENT

Gas Utility Standard TD-4186S, "Internal Corrosion Control of Gas Facilities"

COMPLIANCE REQUIREMENT / REGULATORY COMMITMENT

49 CFR 192.475, "Internal corrosion control: General"

49 CFR 192.476, "Internal corrosion control: Design and construction of transmission line"

49 CFR 192.477, "Internal corrosion control: Monitoring"

49 CFR 192.491, "Corrosion control records"

REFERENCE DOCUMENTS

Developmental References:

NACE SP0106-2006, "Control of Internal Corrosion in Steel Pipelines and Piping Systems"

Supplemental References:

Risk Management Procedure RMP-16, "Threat Identification"

APPENDICES

NA

ATTACHMENTS

NA



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FORMS

Gas Utility Form TD-4186P-500-F01, "Internal Corrosion Control Annual Review"

DOCUMENT REVISION

Gas Design Standard O-16, "Corrosion Control of Gas Facilities" is being replaced by the following document set:

- Gas Utility Standard TD-4180S, "General Corrosion Control of Gas Facilities"
- Gas Utility Standard TD-4181S, "External Corrosion Control of Gas Facilities"
- Gas Utility Standard TD-4186S, "Internal Corrosion Control of Gas Facilities"
- Gas Utility Standard TD-4188S, "Atmospheric Corrosion Control of Gas Facilities"
- Gas Utility Procedure TD-4181P-101, "Cathodic Protection Area (CPA) Design and Modification"
- Gas Utility Procedure TD-4181P-201, "Cathodic Protection Monitoring and Restoration"
- Gas Utility Procedure TD-4181P-202, "Cathodic Overprotection"
- Gas Utility Procedure TD-4181P-301, "Rectifier Maintenance and Adjustment"
- Gas Utility Procedure TD-4186P-100, "Internal Corrosion Control: Liquid and Solid Sampling and Testing"
- Gas Utility Procedure TD-4186P-200, "Internal Corrosion Control: Design Review"
- Gas Utility Procedure TD-4186P-300, "Internal Corrosion Control: Corrosion Rate Monitoring"
- Gas Utility Procedure TD-4186P-400, "Internal Corrosion Control: Mitigation"
- Gas Utility Procedure TD-4186P-500, "Internal Corrosion Control: Annual Program Review"



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DOCUMENT APPROVER

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REVISION NOTES

Where?	What Changed?
All	This is a new utility procedure, part of the document set replacing the internal corrosion control requirements portion of Gas Design Standard O-16, "Corrosion Control of Gas Facilities." O-16 is being updated and rewritten to comply with the new Company guidance document requirements, and is being reorganized and expanded into the following four standards with multiple procedures under each standard: <ul style="list-style-type: none"> • General Corrosion Control • External Corrosion Control • Internal Corrosion Control • Atmospheric Corrosion Control See the Guidance Document Analysis for details.