

PUBLIC UTILITIES COMMISSION

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January 31, 2017

GI-2016-09-SWG31

Jerry Schmitz
Vice President - Southwest Gas Corporation
5241 Spring Mountain Road
Las Vegas, NV 89193-8510

Subject: General Order (G.O.) 112-F¹ Gas Distribution Pipeline Integrity Management Program (DIMP) of Southwest Gas Corporation (SWG)

Dear Mr. Schmitz:

The Safety and Enforcement Division (SED) of the California Public Utilities Commission conducted a General Order (G.O.) 112-F¹, Reference Title 49, Code of Federal Regulations (49 CFR), Parts 191 and 192, Gas Distribution Pipeline Integrity Management Program inspection of Southwest Gas Corporation (SWG) gas distribution system from October 4 through 7, 2016 and December 5 through 8, 2016.

The inspection included a review of the Gas Distribution Pipeline Integrity Management Program (DIMP), procedures and Operator Qualification records pursuant to G.O. 112-F¹, Reference Title 49, Code of Federal Regulations (49 CFR), Parts 191 and 192 for the period of 2014 through 2015. In addition, SED conducted field inspections of pipeline facilities that included field observation of randomly selected individuals performing covered tasks in Victorville District in San Bernardino County. SED staff noted four probable violations and made five recommendations. The probable violations and recommendations are noted in the attached "Summary of Inspection Findings".

Please provide a written response within 30 days of your receipt of this letter indicating the measures taken by SWG to address the probable violations and observations noted in the Summary of Inspection Findings. If you have any questions, please contact Mahmoud (Steve) Intably, at (213) 576-7016 or myself at (213) 576-6297.

Sincerely,

A handwritten signature in blue ink that reads "Kenneth A. Bruno".

Kenneth Bruno
Program Manager - CPUC
Safety and Enforcement Division

CC: Mahmoud (Steve) Intably, SED, Matthewson Epuna, SED, and Laurie Brown, SWG

¹ General Order 112-F was adopted by the Commission on June 25, 2015 via 15-06-044.

Summary of Inspection Findings
2016 Gas Distribution Pipeline Integrity Management Program (IMP) of Southwest Gas Corporation (SWG) Facility in Victorville District of San Bernardino County
October 4 through 7, 2016 and December 5 through 8, 2016

I. SED Identified Probable Violation

1. Title 49 CFR, Part 192, §192.1007 What are the required elements of an integrity management plan?

§192.1007 (c) Evaluate and rank risk states:

“Evaluate and rank risk. An operator must evaluate the risks associated with its distribution pipeline. In this evaluation, the operator must determine the relative importance of each threat and estimate and rank the risks posed to its pipeline. This evaluation must consider each applicable current and potential threat, the likelihood of failure associated with each threat, and the potential consequences of such a failure. An operator may subdivide its pipeline into regions with similar characteristics (e.g., contiguous areas within a distribution pipeline consisting of mains, services and other appurtenances; areas with common materials or environmental factors), and for which similar actions likely would be effective in reducing risk.”

The SWG’s Distribution Pipeline Integrity (DPI) matrix is used in the assessment of the risk to its distribution pipelines. SWG referenced the GPTC guidance for the development of the DPI matrix, the definition of risk provided by SWG contradicts the definition provided in the PHMSA’s DIMP Enforcement Guidance published on January 29, 2014.

According to SWG’s assessment procedure for the DPI application, a point value is assigned to each risk category for each segment. And then, the points from each risk category are summed up, and the total risk scores are used in assessing the risk associated with the pipelines. SED reviewed the risk categories in the DPI matrix and determined that the risk categories can be classified into three groups. Eighteen of the categories in the DPI matrix were related to probability, six to consequence and one to mitigation. The DPI matrix defines the risk as the sum of the point values in these twenty-five categories.

SED is concerned that the summation of the risk categories does not accurately identify the segments with the greatest risk. In fact, the method that is currently used by SWG could possibly result in a different prioritization than the method listed in the PHMSA Enforcement Guidance (i.e., Risk = Probability X Consequence). Let’s consider two hypothetical segments with the following scores for likelihood and consequence:

Segment	Likelihood	Consequence	SWG Method (Likelihood + Consequence)	PHMSA Method (Likelihood x Consequence)
1	50	50	100	2,500
2	10	90	100	900

The example above shows that while the two segments show the same risk scores using SWG's method, PHMSA's method indicates that segment 1 would have a higher risk than segment 2.

Given SWG's unique definition of risk, SED is concerned that the risk model does not necessarily address the segments with the highest risk.

Therefore, SWG is in violation of General Order 112-F¹, Reference Title 49 CFR, Part 192, Section §192.1007(c).

2. Title 49 CFR, Part 192, §192.1007 What are the required elements of an integrity management plan?

§192.1007(c) Evaluate and rank risk, states in part:

“...This evaluation must consider each applicable current and potential threat, the likelihood of failure associated with each threat, and the potential consequences of such a failure...”

According to the Title 49 CFR, Part 192, §192.1007(c), the operator should consider the current and potential threats in assessing the risk to the segments. Given SWG's unique definition of risk, the DPI matrix included the “type of leak/failure (based on the predominant leak grade over last 6 years or worst case if event dispersed)” as one of the categories in evaluating the risk to the segments. In fact, if the root cause of the pipeline failure is integrated in the repair, it may not be appropriate to predict that the same segment will have a higher likelihood to fail again in the future than other segments. Thus, by assigning a higher risk score to the same segment solely based on previous leak/failure, the rankings provided by the DPI matrix may not properly address the segments with the highest risk to public safety.

Instead of assigned a higher risk score solely based on previous leak/failure in the segment, SWG is expected to identify the threats, the failure mechanisms and why a segment failed multiple times. For example, if a pipeline failed multiple times due to corrosion, it would be appropriate to justify that corrosion is the threat and assigned higher risk score to the corrosion. However, it would be inappropriate to assign higher risk score solely based on the facts that the pipeline failed in the previous six years.

Therefore, SWG is in violation of General Order 112-F¹, Reference Title 49 CFR, Part 192, Section §192.1007(c).

3. Title 49 CFR, Part 192, §192.1007 What are the required elements of an integrity management plan?

§192.1007(c) Evaluate and rank risk states in part:

“An operator must evaluate the risks associated with its distribution pipeline. In this evaluation, the operator must determine the relative importance of each threat and estimate and rank the risks posed to its pipeline...”

The regulation requires each operator to evaluate the threats and rank the risks to its pipelines. The evaluation process should have identified any pipelines that posed the greatest public safety concerns regardless whether the pipelines have leaked in previous years. Instead of solely reacting to the pipelines that have leaked in previous years, SWG should consider the potential threats attributes to the pipeline failure. According to the DIMP Enforcement Guidance:

“It is inadequate for an operator to conclude that a pipeline is not subject to any particular threat or threats, based solely on the fact that it has not experienced a pipeline failure that has been attributed to the threat(s). An operator also must consider potential threats.”²

However, by limiting the scope of DPI matrix to the pipelines that have leaked in previous 6 years, the DPI algorithm is unable to proactively/predictably forecast the safety issues of the pipelines that have not experienced a leak.

Therefore, SWG is in violation of General Order 112-F¹, Reference Title 49 CFR, Part 192, Section §192.1007(c).

4. Title 49 CFR, Part 192, §192.1007 What are the required elements of an integrity management plan? Evaluate and rank risk states in part states in part:

§192.1007(b) Identify threats states in part:

“.....An operator must consider reasonably available information to identify existing and potential threats.....”

PHMSA’s DIMP Enforcement Guidance states in part:

“Unavailability of information is not justification for exclusion of a threat. Where data are missing or insufficient, conservative assumptions may be used in the risk assessment...”

While DPI matrix does not exclude a threat when information is unavailable, the risk weighting factors should have been more conservative when data is unavailable or insufficient. For instance, if a condition of a pipeline is unknown, it should be considered as the worst-case scenario. However, DPI matrix does not consider pipeline with unknown condition as the worst-case scenario. For example, the DPI matrix assigns lower risk to pipeline with unknown pipe cover than the ones with pipe cover less than 18-inches.

In addition, pipelines may be exposed to multiple threats for external damage. During the audit, SED provided an example to SWG regarding a segment of the railroad crossing, which is subject to potential ground movement and electrical fault activity, the risk score from each of those threats should be added up to derive the risk ranking. Currently, SWG selects only one threat with the highest risk score.

² See the Enforcement Guidance, page 23, item 8.

SWG should review the risk weighting factor of each risk category and assign the appropriate level of risk to the pipeline with unknown condition. In addition, the DIMP plan does not specify the action plan to acquire missing or incomplete data. SWG should develop a plan to acquire and minimize the possibility of skewing the risk ranking score due to unavailability, inaccurate, or incomplete data.

Therefore, SWG is in violation of General Order 112-F¹, Reference Title 49 CFR, Part 192, Section §192.1007(b).

II Concerns and Recommendations

1. During the record review, one SWG's staff explained that a segment is equivalent to all pipeline segments on a tile; yet, another staff explained that segments are those pieces of pipe that were installed under the same job. SWG does provide some guidance in the "DS-Distribution_Pipeline_Integrity_Procedure", Section 1.3 (Segment Identification), but the guidance seems unclear. Does a segment only include distribution pipe on one tile only? Does it include pipe that was constructed under the same job? SWG should provide a clear definition of the segment in the "DS-Distribution_Pipeline_Integrity_Procedure". The DIMP plan does not identify the minimum qualification requirements for the Subject Matter Experts (SMEs). While SED is satisfied with the qualifications of SMEs provided during the audit, the DIMP plan should specify the minimum qualifications for SMEs and the evaluation process to ensure that SMEs are meeting those standards. SED recommends that SWG provide a clear definition of "segment" in its procedure.
2. During the record review at the central office in Las Vegas, SWG's personnel that oversees the DIMP Program were not able to provide an overall statistics about the primary threats on the pipelines and the personnel deferred the questions to the division personnel. SED recommends that the DIMP Program should have the mechanism that will track and communicate information from division levels to the headquarter so that DIMP SME personnel at headquarters will be better informed and be able to provide an overall statistics for the primary threats on its pipelines on both a division level and on a company wide basis.
3. During record review, SWG's 2016 Pipe Integrity Matrix category the "Potential for External Damage" (Row 52), SED noted that the DPI matrix does not provide instructions for how SWG's personnel should determine which pipeline segments are susceptible to electrical fault. SED recommends that SWG provide instructions on how to determine pipelines that are susceptible to fault/ stray current.
4. Under the category captioned "Potential for External Damage", SED recommends that SWG add a footnote to the "Excavation Activities Present" category on the DPI matrix to provide further explanation for this category (Row 54). In addition, one call ticket frequency history (i.e., over the last 5 years) is a primary indicator of the potential for excavation damage that

may have already occurred, but is not known by SWG. SED recommends this be included in the category.

5. During record review SED noted that the DIMP plan only considers six years of leak records, but it does not explain the rational for why the leak records only looks back six years. SED recommends SWG either justify the lookback period of six years or extend the lookback period to the lifetime of the pipeline segment.