

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE  
STATE OF CALIFORNIA**

Order Instituting Rulemaking on the  
Commission's Own Motion to Adopt New  
Safety and Reliability Regulations for Natural  
Gas Transmission and Distribution Pipelines  
and Related Ratemaking Mechanisms

R.11-02-019  
(Filed February 24, 2011)

**MOTION OF THE CITY AND COUNTY OF SAN FRANCISCO  
TO ADMIT ADDITIONAL EXHIBIT INTO EVIDENTIARY RECORD**

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ATTORNEYS FOR:  
CITY AND COUNTY OF SAN FRANCISCO

## I. MOTION

Pursuant to Commission Rule of Practice and Procedure 11.1, the City and County of San Francisco respectfully submits this motion to admit an additional exhibit into the record of this proceeding. The attached exhibit was prepared by PG&E and provided to TURN in response to a discovery request.<sup>1</sup> The response includes a report from Kiefner and Associates, Inc. titled *Analysis of the Effects of Pressure-Cycle-Induced Fatigue-Crack Growth on the Peninsula Pipeline*, dated March 19, 2012 (“Report”). The Report is relevant to issues under consideration in this proceeding and raises important safety issues that should be addressed. For these reasons, San Francisco requests that the data response and Report be admitted into the evidentiary record of this proceeding as a new exhibit. The Commission should also determine whether additional procedures are necessary to further address the issues identified in the Report.

The Report analyzes “the effects of pressure-cycle-induced fatigue-crack growth on the Peninsula Pipelines” and contains an expected time to failure analysis for the three peninsula transmission lines – lines 101, 109, and 132. It explains that “Pressure-cycle-induced fatigue-crack growth” or cyclic fatigue occurs where subcritical defects in pipelines grow to critical levels based on fluctuation in the operating pressure of pipelines.<sup>2</sup> The Report finds that for pipelines without pressures tests – “it also follows that lower grades of pipe (such as Grades A and B) that were not required to be tested to as high a pressure, or pipe that was not tested at all, could conceivably contain very large cracks”<sup>3</sup> and “pipe that was not tested to at least 1.25 x MAOP has a limited calculated fatigue life.”<sup>4</sup>

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<sup>1</sup> PG&E Data Request TURN 030-Q06 (the response states that “although it is marked as such, PG&E does not consider this document to be covered by the attorney-client privilege”).

<sup>2</sup> Report, at p. 1.

<sup>3</sup> *Id.* at p. 3.

<sup>4</sup> *Id.* at p.1

## A. The Report Identifies Important Safety Concerns

While the Report is very technical, it begs the question whether some of these potentially large cracks appear to be reaching levels that threaten the integrity of PG&E's pipelines. The Report finds that "applying the safety factor to the L 109 fatigue predictions and beginning at the time the pipe was installed, the PG&E-grade pipe would be expired (the pipe was tested in 1936 and the recommended interval as half of the 139-year fatigue life, 70 years, would place reassessment in the year 2006)." <sup>5</sup> In other words, using conservative assumptions, *the reassessment interval for segments of Line 109 expired in 2006.* According to the Report, the reassessment interval for grade B pipe installed in 1959 on Line 109 expires in 2019.<sup>6</sup>

Table 1 in the Report lists the expected time to failure for segments on Line 101, 109 and 132. The last column of that table "Mill Test Time to Failure, years" should be divided by two to apply the safety factor of two, as referenced above. Based on this table, and using the safety factor of two, the reassessment interval for some segments of Line 132 *expired in 1978*, and the *estimated time to failure expired in 2008.*

Table 3 of the Report lists "Estimated Years to Failure for other Segments of L132 Based on a Pressure Reduction."<sup>7</sup> Table 3 notes that if PG&E reduces the pressure to 350 psig for 36 inch pipeline segments on Line 132 with DSAW seams, the estimated years to failure is 7.3 years (before the safety factor of two is applied).<sup>8</sup> This means that with the safety factor, the time to failure for these segments *with the proposed pressure reduction is 3.65 years.* It is unclear how many years remain if PG&E does not reduce the pressure.

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<sup>5</sup> The Report applies a safety factor of two to its analysis. "A safety factor of two (2) has generally been recommended for determining reassessment intervals for the seam-fatigue threat in liquid pipelines for analyses based on test pressure. In other words, reassessment is recommended at half of the predicted time to failure and the reassessment interval begins at the time of hydrostatic test used in the fatigue calculation." *Id.* at p. 2.

<sup>6</sup> *Id.*

<sup>7</sup> *Id.* at p. 7.

<sup>8</sup> *Id.*

The report makes two findings relevant to pipeline segments without pressure tests. First, “a pressure reduction can slow potential crack growth and allow time to plan for an integrity assessment.”<sup>9</sup> Second, “protection against over-pressurization events is important.”<sup>10</sup> “The similar fatigue lives for some cases shown in Table 2 are an indication that the large flaws are sensitive to the overpressure events. In the absence of these events, the flaws could potentially endure more pressure cycles before they became critical.”<sup>11</sup> Given that the Report assigns large significance to avoiding over-pressurizations to ensure the integrity of lines without prior pressure tests, the Commission should require PG&E to demonstrate how its current operational practices have incorporated the recommendation to avoid over-pressurizations.

It also unclear whether PG&E has performed fatigue analysis for other lines in its system or has identified relevant segments that should be prioritized for reassessment and protection from over-pressurization.

**B. It is Appropriate to Admit the Exhibit into the Record At This Time**

The Report is highly relevant to issues in this proceeding, including the schedule and priorities of Pipeline Safety Enhancement Plan (“PSEP”) work, the prudence of PG&E’s historic operations, and the overall safety of PG&E’s gas pipeline system. Neither the Report nor the PSEP testimony addresses how or whether the safety issues identified by the Report are being remedied by the PSEP or whether they have been remedied already. PG&E’s PSEP was developed and proposed before the Report was finalized. Given the import of the Report’s findings, the Commission should admit the exhibit into the record and ensure that the segments identified as needing urgent assessment are addressed in Phase I of the PSEP and that PG&E takes the necessary precautions to protect against over-pressurizations. In addition, because it appears that PG&E has exceeded and/or is fast approaching the expected time to failure and

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<sup>9</sup> *Id.* at p. 1.

<sup>10</sup> *Id.*

<sup>11</sup> *Id.* at p. 4.

reassessment intervals for pipelines in its system, the Report is relevant to evaluating the prudence of PG&E's actions, which many parties addressed in their opening briefs.

San Francisco became aware of this document on May 3, 2012, and reviewed the document and prepared this motion immediately after filing its opening brief in this proceeding on May 14, 2012. Although the hearings on PG&E's PSEP have concluded, the matter has not yet been submitted for determination.<sup>12</sup> The Report was prepared by PG&E's experts at PG&E's direction and provided in a discovery response in this proceeding. PG&E has been aware of and in possession of this document since at least March 19, 2012, so admitting the exhibit into evidence will cause no unfair surprise or prejudice to PG&E. San Francisco is not aware of any evidence currently in the record regarding expected time to failure for PG&E's pipelines, so this exhibit is not duplicative of other evidence in this proceeding.

## **II. ADDITIONAL ISSUES**

The Report raises other issues that should be addressed:

1. Will all segments identified as exceeding or nearing their reassessment intervals be assessed as part of Phase I of the PSEP? If no, why not? Which segments are not being prioritized for assessment in Phase I?
2. Will all segments identified as exceeding their expected time to failure be assessed as part of Phase I of the PSEP? Have these segments been prioritized within Phase I? If no, why not? Which segments are not being prioritized?
3. For the segments implicated in Tables 2, 3 and 4, what is the estimated years to failure for these segments without the pressure reduction? Are the segments identified in these tables the same as the segments identified in Table 1? How are the segments identified in Tables 2, 3, and 4 related to the segments identified in Table 1?

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<sup>12</sup> At the close of the evidentiary hearings, ALJ Bushey stated that "with the filing of the reply briefs, this matter will be submitted for determination by the Commission." Transcript Vol. 15 at 2328:21-24.

4. The Report states “the results also show that the predicted fatigue life is relatively insensitive to the pipe properties (wall thickness, material strength, and toughness).”  
Table 3 shows that large diameter pipe with DSAW seams have only 7.3 years remaining before expected time to failure, if PG&E reduces the pressure to 350 psig. This seems to suggest that the type of seam found on a pipeline is not predictive of pipeline failure.  
What is the relevant feature(s) for this portion of the analysis? Date of installation? Lack of pressure test? Lack of mill test? Number of pressure cycles experienced?
5. Given the response to the last question above, does PG&E’s decision tree incorporate the relevant feature(s)? If yes, how? If no, why does the decision not incorporate aspect into the decision trees?
6. Does the analysis incorporate over-pressurizations other than the pressure excursions identified in Figures 2, 3 and 4? Have there been other over-pressurizations/excursions since? How does this fact affect the risk analysis?
7. The report finds that “the size of the flaw presumed to exist is dominating the fatigue calculations and overpressure events can threaten the benefit of a pressure reduction.” If there have been over-pressure events since this analysis was performed, how does that event(s) alter the benefit of the pressure reduction?
8. Based on the report’s findings, how does PG&E intend to revise its PSEP in terms of works prioritized and decision tree criteria?
9. Has PG&E addressed the threat of cyclic fatigue for these pipe segments in its Transmission Integrity Management Program? If yes, how, and what actions are being performed as a result? If no, why not?
10. One of the key assumptions is that pipeline made to X52 grade was subjected to a mill test of “typically 10 seconds long.” Does PG&E have manufacturing records to support this assumption? How valid is the assumption that such mill tests were performed? Were there quality assurance procedures in place? Did PG&E perform audits of its pipe suppliers? If yes, does PG&E have records of these audits? What is the utility of a ten

