Pacific Gas and Electric Company

Jane Yura
Vice President
Asset & Risk Management
Gas Operations

6111 Bollinger Canyon
4th Floor
San Ramon, CA 94583
925-244-3398
Internet: JKY1@pge.com

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Pipeline and Hazardous Materials Safety Administration
Docket Management System
U.S. Department of Transportation (DOT)
1200 New Jersey Avenue SE., Room W12-140
Washington, DC 20590

RE: Comments on PHMSA Integrity Verification Process (IVP) Proposal
Docket No. PHMSA-2013-0119

Dear Pipeline and Hazardous Materials Safety Administration:

Pacific Gas and Electric Company (PG&E) appreciates the opportunity to submit comments on the Pipeline and Hazardous Materials Safety Administration (PHMSA) IVP proposal presented at the *PHMSA Workshop on Integrity Verification Process for Natural Gas Pipelines* held on August 7, 2013 and the subsequent revised proposal, dated September 10, 2013.

PG&E is one of the largest combined natural gas and electric utilities in the United States. The company provides natural gas and electric service to approximately 15 million people throughout a 70,000-square-mile service area in northern and central California. The company serves approximately 4.3 million natural gas distribution customers with 42,141 miles of natural gas distribution pipelines and 6,438 miles of transmission pipelines.[1]

PG&E commends PHMSA on the proposal to further enhance the safety of the nation's gas transmission pipelines. Many of the requirements in the IVP proposal[2] are consistent with PG&E's current pipeline safety efforts. The following comments are provided for consideration by PHMSA based upon PG&E's experience with MAOP validation and strength testing in-situ pipelines over these recent several years.

PG&E has completed a comprehensive review of its records to validate Maximum Allowable Operating Pressure (MAOP) for all of its transmission lines. Through this process, PG&E has reviewed records associated with material specifications and also identified and reviewed pressure test records that meet the requirements by the respective regulations at the time of installation to validate MAOP. PG&E recommends that these records remain acceptable for pressure test documentation and that additional testing under Subpart J is not necessary to validate MAOP as long as the test conducted prior to the federal regulations for pressure testing meets the minimum test multipliers outlined in the proposed IVP. Before 1970, when Federal pipeline safety regulations went into effect, an 8-hour hold time was not required and California's General Order 112 (established in 1961) specified a 1-hour hold time. The key considerations for pressure test hold time to determine pipeline integrity are discussed in the Oil

[1] Transmission pipelines include those operating below 20% SMYS and greater than 60 psig.
[2] All references are to the "PHMSA Draft IVP Chart," dated September 10, 2013.

& Gas Journal article, "Study Questions Specified Hydrotest Hold Time's Value," by Kiefner & Associates Inc.[3]

PG&E supports AGA's comments on separating MAOP verification from gas transmission integrity management. PG&E recommends including the integrity management principles in the proposed IVP but these principles should be categorized as "Integrity Management" (instead of MAOP Validation).

PG&E recommends that the "Material Documentation Process" included in the IVP proposal use a statistically based method to test pipe samples to verify material specifications. However, the minimum requirement to have a mill test record or other destructive test results should be reconsidered; PG&E recommends that as-built documentation with first person witness of installation or non-destructive testing of material properties, combined with historical procurement standards, can be a valid method of establishing the material specifications. PG&E also recommends that PHMSA define the parameters for quality records. PG&E is including our records quality framework used for our MAOP validation process as Attachment 1. PG&E recommends reconsidering Note 3 of the revised PHMSA IVP Chart reference to "chemical properties," as the chemical properties do not directly contribute to the calculation of the MAOP.

PG&E supports a process that utilizes conservative assumptions based on historical material procurement standards as "validated traceable material documentation" for fittings and pipe as an alternative to performing a cutout and test of pipe. As part of our MAOP records review, PG&E ensured that conservative assumptions were supported by quality ranked documents and statistical analysis of actual field excavation results. Documentation in support of our study results is provided as Attachment 2.

PG&E supports the use of spike testing and has conducted a significant amount of spike testing the past several years as part of pressure testing its transmission lines in Class 3 and Class 4 locations and in Class 1 and Class 2 high consequence areas to meet an NTSB recommendation.[4] PG&E conducted these spike tests where MAOP was not established through prior pressure testing using technical guidance from Kiefner & Associates, Inc.[5] The spike test involves subjecting the piping system to a maximum pressure level that is held for a short duration at the beginning of the test followed by a longer duration hold period at a reduced pressure. PG&E's standards include the range of a spike hydrostatic test pressure factor from 1.05 (minimum) to 1.1 (maximum) with the duration of the spike test at 30 minutes (with a minimum acceptable duration of 15 minutes). However, spike testing may not be feasible in all instances due to considerations for elevation differences and overstressing of pipeline components, which may preclude the performance of a spike test.

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[3] http://www.ogj.com/articles/print/vol-110/issue-3/transportation/study-questions-specified.html
[4] NTSB Pipeline Safety Recommendation P-10-4, dated January 3, 2011. http://www.ntsb.gov/doclib/recletters/2010/P-10-002-004.pdf
[5] Several papers by Kiefner & Associates, Inc. on the appropriate application of spike testing can be found at: http://www.kiefner.com/downloads.asp.

PG&E also requests that PHMSA clarify the following:

1. IVP requirements for piping other than "mainline piping," for example, short appurtenances such as blow-downs and drips, and piping within gas processing, regulation and compressor stations.
2. For ***Legacy Pipe*** definition, guidance on distinguishing arc welds used in legacy versus modern pipe.
3. Spike test requirements, for example duration and level of spike test.
4. Definition of "long term statistical sampling program" as referenced in Step 11, Material Documentation Process.

Some of these issues may require additional technical development, and PG&E would be willing to participate in future workshops.

All changes and implementation schedules adopted should provide the greatest overall risk reduction for the investments that will be required. Additionally, the industry needs to be given adequate time to perform remedial actions required by the final process flow. PG&E looks forward to continuing to work with PHMSA and the industry to improve pipeline safety.

Respectfully submitted,

Jane Yura
Vice President, Asset & Risk Management

cc: General Jack Hagan, CPUC
Liza Malashenko, CPUC
Alan Mayberry, PHMSA
Jeffrey Wiese, PHMSA
Joe Medina, PG&E
Sumeet Singh, PG&E
Jesus Soto, PG&E
Nickolas Stavropoulos, PG&E
Rolando Trevino, PG&E
Frances Yee, PG&E

Attachments

Attachment 1: Record Quality Categorization – Material Specifications

For the purposes of review, documents are considered high quality records if they were prepared at the time of installation, can be traced to the job site, represent the completed final installation conditions (e.g. as-built records), and account for an appropriate quantity of materials installed. The MAOP Validation project utilizes Quality Codes to assist in determining the quality of a document. Table 1 lists the current version of these ratings and their definitions.

Documents rated Q1 to Q3 that are traceable and prepared at the time of installation are considered high quality. Documents are considered to be of lower quality if they were transcribed from original documents, cannot be traced to the job site, represent preliminary design conditions, and/or did not account for all asset materials installed (e.g. specifications are shown on a purchase document for one asset where three were installed). In Table 1, documents having a rating of Q1-Q5 are considered traceable, verifiable and complete.

Rating	Document	Description	Quality
Q1	Mill Test Reports, factory test reports. These are most important for the Yield Strength of the metal. Wall thickness and OD should match to as-built information. Must have proof of delivery.	Represents Manufacture Delivered and Certified for a particular job or project	High
Q2	Receipt / Delivery Tags with clear dates, job number and/or locations. The specifications may be on another document, but this document proves delivery.	Represents Manufacture Delivered to the job.	
Q3	Purchase Orders, As-built Drawings, As-built Strength Test Pressure Reports, As-built Bill of Materials or Bill of Material with Purchase Order numbers listed. Material requisitions that are signed or dated as received.	Represents Company Purchase or Witness of Installation	
Q4	Inspection Reports, Distribution and Transmission Plat Sheets, Operating Maps and Diagrams, "typical" drawings of standard materials and installations of these materials. You can utilize material lists from "typical" drawings if they are clearly referenced on the original as-built drawing.	Represents witness of installation, from a secondary document source.	Complimentary Records Recommended
Q5	Project Close out reports, construction cost reports.	Represents witness of installation, from a tertiary document source.	
Q6	Material Requisitions, Bill of Materials with Engineers Material Memo (EMM) listed. Or EMMs by themselves.	Represents early intent. This is what the engineer or designer intended.	Low
Q7	Design Packages and Bill of Materials Approved for construction.	Represents early intent.	

Table 1 – Q-Ratings of Record Documents

Attachment 1: Record Quality Categorization – Strength Test Pressure Reports (STPRs)

Strength Test Pressure Report (STPR) document quality assessment is aided through the use of Table 2. Historical STPR records rated Q1-Q7 are considered high quality, valid tests. Historical STPR records rated Q8-Q13 are considered invalid tests and are not used to validate MAOP.

Rating	Document	Description
Q1	Strength test pressure report with dead weight log and charts, test supervisor name, pressure, medium, duration, elevations, signed and dated.	Represents certified original witness observed.
Q2	Test report with charts signed and dated. Test supervisor Name, pressure, medium, duration, and elevations.	Represents certified original witness observed.
Q3	Test report with charts signed and dated. Test supervisor Name, pressure, medium, duration, NO elevations and this is water tested. If it is gas tested the elevations are not material to the test and you can give it a Q2.	Represents certified original witness observed. Elevations unclear, assumed to follow standards.
Q4	Original Charts only, signed and dated. Test supervisor name, pressure, medium, duration, elevations	Represents certified original witness observed.
Q5	Original Charts only, signed and dated. Test supervisor name, pressure, medium, duration, NO indication of elevations.	Represents certified original witness observed. Elevations unclear.
Q6	Strength Test Pressure Report with no charts or dead weight log, With Test Supervisor name, pressure, medium, duration, and elevations.	Represents certified original witness observed, lacking charts.
Q7	Strength Test Pressure Report with no charts or dead weight log, With Test Supervisor name, pressure, medium, duration, and NO elevations.	Represents certified original witness observed, lacking charts and elevations.
Q8	Copy of Test Report with Dead Weight Log or Charts. With Supervisor name, Missing test duration, test pressure, or test medium.	Represents certified original witness observed, lacking required data.
Q9	Has duration, pressure, medium. No supervisor name	Represents direct but uncertified observation
Q10	Documentation of test duration, pressure, medium and the supervisor name, but postdated more than 1 year after the actual test date. (some exceptions might be allowed depending on job details)	Represents potential affidavit of required data and uncertified observation
Q11	Documentation on a chart, log or test form of the test fluid and the test pressure.	Represents direct minimum records but uncertified observation
Q12	Other variations of missing, pressures, medium, duration, elevation, dates, charts, pipe specifications, etc.	Represents lack of required data and uncertified observation
Q13	Design Packages, Approved for construction	Represents remote or obscure observation

Table 2 – Q-Ratings of STPRs

Attachment 2: Analysis of PG&E's Process for Resolution of Unknown Material Specifications

Executive Summary

A study of PG&E's natural gas pipeline specification data gathered from excavations that were conducted to validate the accuracy of PG&E's records and to determine the judiciousness of the application of assumptions for unknown specifications of pipeline features as defined in the Procedure for Resolution of Unknown Pipe Features (PRUPF). Information gathered from 31 non-destructive excavations (digs) provided 92 verifiable data points. These data points are associated with 46 features that were reviewed for Wall Thickness (WT) and/or Longitudinal Weld Seam (LS) accuracy in comparison to assumptions. Three instances, or 4.2% of the PFL data reviewed, were found to be non-conservative when compared to field verified values. In no instance was the MAOP of the line negatively impacted by a non-conservative assumption. These results are shown graphically in Figure 1.

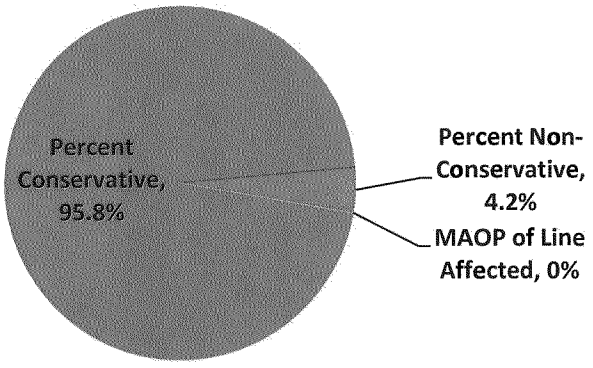

Figure 1: Results of Assumptions Assessment

Results

An evaluation of all assumption based data points revealed 3 instances (4.2%) of non- conservative data points for WT and LS. These data points were based solely on assumptions from the PRUPF. In no instance was the MAOP of the line affected by these non-conservative results. The non-conservative results are broken down by data type in Table 1.

	Total Data Points	Conservative	Non-Conservative	Not Verified
WT	46	44	2	0
LS	46	25	1	20
Total	**92**	**69**	**3**	**20**

Table 1: Total Results by Data Type

Non-Conservative Values Associated with Assumptions:

- 4.2% of field verified values were non-conservative compared to assumptions from the PRUPF
- 0% of field verified values were non-conservative compared to assumptions from the PRUPF and produced a lower MAOP than the MAOP of Record

Key Take-Away: The use of conservative assumptions for material specifications that are not available from records based on a process established from historical procurement standards can be used to support the MAOP validation of pipelines. Successful implementation of this process should continually utilize and verify information gathered from field inspections and apply the findings to the use of conservative assumptions.

Attachment 2: Analysis of PG&E's Records-Based Material Specifications

Executive Summary

Information gathered from 100 non-destructive examination excavations (digs) that were performed for MAOP Validation or as a result of the Hydrostatic Testing program provided 153 verifiable data points. These field-verified data points were compared to PG&E's records documentation for Wall Thickness (WT) and/or Longitudinal Weld Seam (LS) accuracy. From this review, 84% of values from high quality records were validated and 59% of values from low quality records were validated. Overall, 20% of all record specifications were found to be inaccurate; however, only two instances (1.3%) impacted the MAOP of the line negatively. The results of the study are presented in Figure 2.

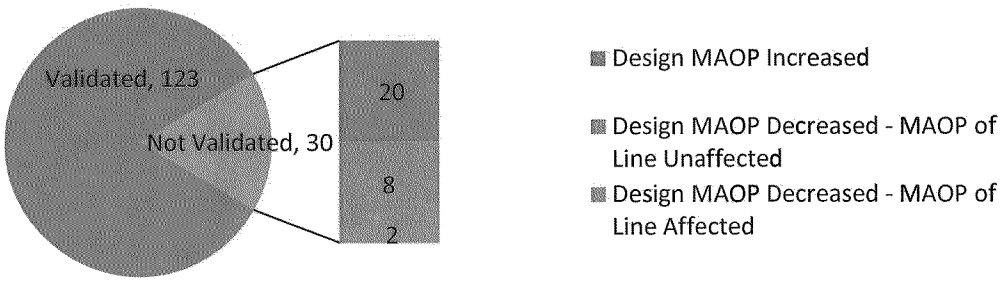

Figure 2 – Results of Record Assessment (# of instances)

Results

The results of record comparisons with field verified data were categorized as Validated or Not Validated. The results from all dig data comparisons (both Hydrostatic Test Program and MAOP validation digs) are shown in Table 2.

Category	Validated	Not Validated
High Quality	110 (84%)	21 (16%)
Low Quality	13 (59%)	9 (41%)
Combined	123 (80%)	30 (20%)

Table 2 – Total Dig Data Results

These results show that 20% of all records were found to be inaccurate. Of the 30 data points that were found to be inaccurate, 10 (6.7%) were found to have an adverse effect on the MAOP of the pipeline feature in question. Of these 10 data points, 2 (1.3%) were found to cause the design MAOP of the feature to be less than the MAOP of record of the line and to cause the line to operate at a percentage of Specified Minimum Yield Strength (SMYS) that is greater than is allowed per the class location of the line.

Key Take-Away: Establishing record quality categories when reviewing historical records utilized for MAOP validation provides an understanding of the underlying quality level of the source documentation and ensures the appropriate application of the traceable, verifiable and complete standard.