

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.

Rulemaking 11-02-019
(Filed February 24, 2011)

**MOTION OF THE DIVISION OF RATEPAYER ADVOCATES
FOR A RULING DIRECTING PACIFIC GAS AND ELECTRIC COMPANY
TO PROVIDE QUALITY ASSURANCE AND QUALITY CONTROL PLANS
FOR THE DEVELOPMENT AND IMPLEMENTATION OF ITS UPDATED
PIPELINE SAFETY PLAN ("PSEP")**

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July 8, 2013

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I. INTRODUCTION AND SUMMARY

In accordance with Rule 11.1 of the Commission's Rules of Practice and Procedure, the Division of Ratepayer Advocates ("DRA") hereby requests that the Commission direct Pacific Gas and Electric Company ("PG&E") to provide documentation of the quality assurance and quality control processes used at each step in the development and implementation of its pending "update" to the Pipeline Safety Enhancement Plan ("PSEP") approved by the Commission last December in Decision ("D.") 12-12-030.

Quality assurance has been defined as "all those planned and systematic actions necessary to provide adequate confidence that a structure, system or component will perform satisfactorily in service."¹ Quality assurance and quality control procedures are a set of fundamental requirements in any complex investigation, engineering, or construction project, where opportunities exist for mistakes and miscalculations to propagate undetected throughout a project. It is especially important to have a solid plan for controlling errors where public safety is at risk. While an effective QA plan will significantly reduce errors it is prudent to assume that some errors will still occur in complex projects. Those errors should be caught and promptly corrected by quality control procedures. A well-crafted QA/QC plan is an indispensable risk reduction tool that should provide steps for both detecting and correcting residual errors before safety is compromised. It is essential to public safety as well. Accordingly, DRA requests that the Commission direct PG&E to provide a Quality Assurance and Quality Control Plan (QA/QC Plan) to ensure that the Commission and the public can have confidence that the PSEP will be carried out with minimal errors. The QA/QC Plan should cover

¹ See D.88-12-083, 1988 Cal. PUC Lexis 886, fn. 6 (on page 6 of Lexis version) (citing the definition of quality assurance in the federal regulations governing the construction of nuclear power plants). The decision recounts a history of problems with PG&E's quality assurance programs for the design and construction of the Diablo Canyon nuclear power plant. Among other things, the decision recounts that: "The Nuclear Regulatory Commission suspended the operating license for Diablo Canyon on November 19, 1981, and mandated that PG&E develop an Independent Design Verification Program to review the design of all safety-related structures, systems, and components." (Id. at p. 11.) Although the PSEP involves PG&E's gas transmission system rather than a nuclear power plant, DRA can think of no reason that quality assurance should be defined any differently in the context of a major gas transmission project.

both (1) the *development* of the updated PSEP (which PG&E will soon submit to the Commission in an application pursuant to D.12-12-030) and (2) the *implementation* of the updated scope of PSEP that is authorized by the Commission.

DRA also requests that the Commission commit to a careful review of the Updated PSEP, including (1) the quality assurance and quality control elements of the project, and (2) the underlying data used to develop the updated PSEP.

In Decision (“D.”) 12-12-030, approving PG&E’s PSEP, the Commission ordered PG&E to “file an expedited application 30 days after completing its validation of Maximum Allowable Operating Pressure (“MAOP”) and pipeline records search work.” The decision directed PG&E to include in the Updated PSEP Application a corrected and updated pipe segment database (“PSEP Database”)² and to “update its Implementation Plan authorized revenue requirements and related budgets.”³ We will refer to this updated implementation plan to be submitted by PG&E consistent with this direction as the “Updated PSEP Application”.

Pursuant to D.12-12-030, the Energy Division held a workshop on March 26, 2013 for PG&E and interested parties to discuss “[t]he specific showing that PG&E will be required to provide in its application.”⁴ During the March Workshop, and in follow-up data requests, DRA has sought to understand how PG&E will ensure that the Updated PSEP will be based on accurate information and is consistent with CPUC directives, industry best practices, and relevant quality standards. Achieving these goals requires a quality assurance (“QA”) plan that defines proactive processes to prevent errors, and the quality control (“QC”) procedures that will be used to uncover and correct errors on a reactive basis. This Motion refers to all QA and QC plans, processes, procedures, data collection, data analysis, and reporting collectively as “QA/QC Activities.”

PG&E represents that it is performing QA/QC activities as part of its validation of the maximum allowable operating pressure (“MAOP validation”), and it has provided

² D.12-12-030, *mimeo*, p. 115.

³ D.12-12-030, *mimeo*, Ordering Paragraph 11, p. 129.

⁴ D.12-12-030, *mimeo*, p. 115.

documentation to DRA that explains that effort. However, the Commission, in D.12-12-030, required PG&E to update the PSEP revenue requirement figures as part of its Updated PSEP Application and this requires performing additional steps after MAOP validation. All seven steps required to develop the Updated PSEP are depicted in Attachment A to this Motion. Despite several requests for information about QA/QC plans for its PSEP, PG&E has not provided to DRA evidence that it has a comprehensive QA/QC Plan, or that it is performing significant QA/QC activities in developing the Updated PSEP for the steps that follow MAOP validation.

Because it is critical that PG&E have an adequate QA/QC Plan for the extensive pipeline work it is undertaking, DRA requests that the Commission issue an order directing PG&E to perform QA/QC activities at each of the steps shown in Attachment A, in accordance with a QA/QC Plan that must be included in its Updated PSEP Application. The QA/QC Plan should also address implementation of the PSEP work authorized by the Commission. DRA also requests that the Commission have its staff or consultants perform independent QC activities for the first five steps.⁵

A proposed ruling consistent with this Motion is attached as Attachment B.

II. DISCUSSION

A. PG&E Has a History of Failing To Perform QA/QC

1. NTSB and IRP Report Findings

PG&E's historic lack of quality assurance and quality control procedures have been extensively noted and criticized by both the National Transportation Safety Board ("NTSB") and the Independent Review Panel ("IRP") hired by this Commission. The NTSB Report blamed the installation of the defective segment in Line 132 on PG&E's lack of quality assurance and control in 1956:

⁵ DRA commits to performing QC activities on Steps 6 and 7 of PG&E's updated PSEP plan (see Attachment A). Steps 6 and 7 relate to the cost of the Updated PSEP.

... the probable cause of the [San Bruno explosion] was the Pacific Gas and Electric Company's ... (1) inadequate quality assurance and quality control in 1956 during its Line 132 relocation project, which allowed the installation of a substandard and poorly welded pipe section with a visible seam weld flaw that, over time grew to a critical size, causing the pipeline to rupture during a pressure increase stemming from poorly planned electrical work at the Milpitas Terminal...⁶

The NTSB found that PG&E's poor quality control was also a factor in the Rancho Cordova installation that resulted in an explosion in 2008, and in PG&E's inadequate emergency response after that explosion:

... the NTSB notes that several of the deficiencies revealed by this investigation, such as poor quality control during pipeline installation and inadequate emergency response, were also factors in the 2008 explosion of a PG&E gas distribution line in Rancho Cordova, California.⁷

The IRP Report noted the importance of quality assurance, which in data projects includes systematic checks for accuracy at multiple stages after data entry has been performed under quality assurance requirements. It recognized that PG&E's failure to have any quality assurance of its pipeline records after the initial data entry (which was obviously not subject to quality control) allowed the misinformation about Line 132 to persist in the database for decades:

Data management is important, but it is just one process in the chain. Quality assurance is the framework that runs throughout the entire process. A review by experienced piping engineers who question assumptions and demand substantiation should be a part of the quality assurance for the threat identification and risk ranking process. At any number of process steps in PG&E's threat identification and ranking processes, a casual review by an experienced piping engineer should have flagged the mischaracterization of the pipe seam type for the Line 132 segments that are the subject of this investigation.⁸

⁶ NTSB Accident Report NTSB/PAR-11/01 PB2011-916501, adopted August 30, 2011, p. xii.

⁷ See, e.g., NTSB Report, p. 116.

⁸ Report of the Independent Review Panel San Bruno Explosion, June 24, 2011, p. 62 (*emphases added*).

This theme of PG&E's lack of QA/QC activities runs throughout the IRP Report.²

Inadequate quality assurance and quality control on major projects is not a new problem for PG&E, and it is not limited to its gas operations. Inadequate quality assurance and quality control led to safety problems and enormous cost overruns during PG&E's construction of the Diablo Canyon nuclear power plant in the 1980s. In its decision approving a multibillion dollar settlement in that case, the Commission acknowledged Nuclear Regulatory Commission findings that PG&E had inadequate quality assurance practices. The decision also includes a summary of DRA testimony regarding PG&E's inadequate quality assurance and quality control on the project.¹⁰ The sad story of the Diablo Canyon nuclear plant should serve as a reminder that inadequate QA/QC can endanger the public and cost ratepayers and shareholders literally billions of dollars.

2. QA/QC Problems with PG&E's Initial PSEP

In its original PSEP application, PG&E requested funding for a Program Management Office (PMO), including a Quality Assurance/Quality Control (QA/QC) team:

Available at: http://www.cpuc.ca.gov/PUC/events/110609_sbpanel.htm

² See, e.g., IRP Report, p. 8 ("The lack of an overarching effort to centralize diffuse sources of data hinders the collection, quality assurance and analysis of data to characterize threats to pipelines as well as to assess the risk posed by the threats on the likelihood of a pipeline's failure and consequences.") and p. 62 ("PG&E lacks robust data and document information management systems and processes. These hinder the collection, quality assurance/quality control, and analysis of data to fully characterize threats to pipelines as well as assess the risk posed by the threats on the likelihood of a pipeline's failure.") and p. 72 ("The fact the line pipe DSAW seam type was incorrectly recorded as 'seamless' is symptomatic of PG&E's inadequate quality control and quality assurance management. The failure to properly document the seam type designation as DSAW, rather than seamless is not sufficient in itself to have prevented this incident, but had the records been more complete and the characterization been part of a more refined threat identification process, then the tragedy might have been avoided. Without a quality assurance program embedded in the integrity management process— and a feedback loop when anomalies are uncovered or pipelines do fail, mistakes happen. Unheeded lapses in the end-to-end process of pipeline integrity can lead to accidents like San Bruno.").

¹⁰ See D. 88-12-083 in Applications 84-06-014 and 85-08-025, 1988 Cal. PUC LEXIS 886; 30 CPUC2d 189; 99 P.U.R.4th 141 (December 19, 1988, amended June 16, 1989).

“ . . . responsible for establishing processes and procedures to evaluate overall project and program performance on a regular basis to provide confidence the projects adhere to relevant quality standards. This team will also monitor specific project results and perform test procedures on project components to determine if they comply with *relevant quality standards*.”¹¹

Ratepayer funding for this QA/QC team was authorized by D.12-12-030.¹² In its original PSEP application, PG&E did not define the *relevant quality standards* it used in developing the application, nor did it provide the QA/QC processes and procedures used. DRA therefore performed its own QC review of steps 4, 5, 6, and 7 depicted in Attachment A. As the record of this proceeding shows, multiple errors were found in each of these steps, resulting in mis-prioritization of segments, inefficient project design, excessive PSEP costs, and misallocation of costs between ratepayers and PG&E shareholders.¹³ Some of these errors result from the use of pipeline feature and pressure test data known to be flawed, and D.12-12-030 aimed to eliminate these errors by requiring the Update Application based on data corrected through the MAOP validation process.¹⁴ But other errors were not attributable to incomplete or flawed segment level data, and these errors will not be resolved by the MAOP validation process. In particular, many of the outcomes (i.e. whether to test or replace a line segment) in PG&E’s initial PSEP Database were inconsistent with PG&E’s stated Decision Tree logic. In addition, high priority Phase 1 projects included low priority Class 1 and 2 non-HCA segments in contradiction to clear direction from the CPUC.¹⁵ The result of these errors was delayed

¹¹ PG&E Application dated August 26, 2011 in this rulemaking, Chapter 7, p.7-11, emphasis added.

¹² PG&E’s PMO request for \$34.8 million was reduced in D.12-12-030 to \$28.9 million due to blanket adjustments to the 2011 and 2012 budget requests and escalation.

¹³ A summary is provided in DRA’s Opening Brief in this proceeding dated May 14, 2012. See Section IV (A), pages 49-67. DRA’s review methods and detailed findings were cataloged in the testimony of DRA witness Roberts in Hearing Exhibit 144. Errors related to steps 4, 5, 6, and 7 are found in sections 3, 4, 5, and 6 of this testimony respectively. These errors were discovered as part of DRA’s efforts to determine the reasonableness of PG&E’s cost request, rather than resulting from a rigorous QC evaluation, and thus are not a comprehensive catalog of all errors.

¹⁴ D.12-12-030. See pp. 114-115 and Finding of Fact 34, p.119.

¹⁵ D-11-06-017, Ordering Paragraph 4, p. 31. This included more segments than adjacent segment deemed to be justified by D.12-12-030, Conclusion of Law 20, p. 123.

mitigation of some of the highest priority pipelines, and an increase in the scope and cost of Phase 1 of the PSEP. These errors were not uncovered in the limited review of the PSEP Application by Jacobs Consultancy, under the direction of the Commission's Consumer Safety and Protection Division ("CPSD"), which is now called the Safety and Enforcement Division ("SED").¹⁶

B. While PG&E Represents It Is Performing QA/QC for MAOP Validation, Its Efforts for the Balance of the Updated PSEP Appear Insufficient

As stated in D.12-12-030, "the purpose of accurate records is not limited to calculating MAOP."¹⁷ Given DRA's time-consuming experience working with the PSEP data in PG&E's original application, DRA raised the issue of how to ensure the quality of the Updated PSEP at the March 2013 Workshop. During this Workshop, DRA presented a flow chart depicting its understanding of the development process for the Updated PSEP. Attachment A reflects a revised version of that flow chart, which depicts seven stages in the development of the Updated PSEP, from the MAOP validation at Step 1, to the calculation of revised ratepayer PSEP obligations at Step 7. Steps 1 to Step 5 as depicted in Attachment A result in a database, the PSEP Database, which determines both the prioritization and cost of PSEP projects.¹⁸ In each of these five steps, pipeline feature and pressure test data is entered, manipulated, supplemented, or otherwise revised such that errors can be introduced into the PSEP Database. It is normal practice in database development for some level of QA/QC to be performed whenever data is managed in a manner whereby errors can be introduced. Absent PG&E employing such practices in its development of the PSEP Database, it is possible, and even likely, that PG&E's new PSEP Database – which PG&E intends to rely upon to determine which pipeline segments will be tested and/or replaced, and the priority and cost of that work – will

¹⁶ See December 23, 2011 report filed in this docket.

¹⁷ D.12-12-030, p.95.

¹⁸ D.12-12-030 specified the mitigation costs, and cost allocation methods to be used in the Update Application, so pipeline features and pressure test data in the PSEP database are the primary variables driving PSPS costs.