National Transportation Safety Board
Washington, D.C. 20594

Office of the Chairman

AUG 2 9 2012

Mr. Christopher P. Johns
President
Pacific Gas and Electric Company
77 Beale Street
San Francisco, California 94105

Dear Mr. Johns:

Thank you for your May 23, 2012, letter regarding Safety Recommendations P-10-3 and -4, P-11-3, and P-11-24 through -31, stated below, which the National Transportation Safety Board (NTSB) issued to the Pacific Gas and Electric Company (PG&E) on January 3, 2011, June 8, 2011, and September 26, 2011, respectively. These recommendations were issued as a result of our investigation of the September 9, 2010, natural gas pipeline rupture that occurred in a residential area in the City of San Bruno, California. Safety Recommendation P-10-3 is an urgent recommendation.

P-10-3

> Use the traceable, verifiable, and complete records located by implementation of Safety Recommendation P-10-2 (Urgent) to determine the valid maximum allowable operating pressure, based on the weakest section of the pipeline or component to ensure safe operation, of Pacific Gas and Electric Company natural gas transmission lines in class 3 and class 4 locations and class 1 and class 2 high consequence areas [HCA] that have not had a maximum allowable operating pressure established through prior hydrostatic testing.

The NTSB notes that, in January 2012, PG&E completed validation for 2,088 miles of pipeline located in HCAs and that, during this work, PG&E submitted periodic updates to the California Public Utilities Commission (CPUC) on its progress. Through April 2012, PG&E completed validation of 1,032 miles of non-HCA pipeline, and it is continuing its work to validate the remaining non-HCA pipeline. PG&E estimates it will have validated over 4,600 miles of non-HCA pipeline by early 2013. Pending completion of this work, Safety Recommendation P-10-3 is classified "Open—Acceptable Response."

P-10-4

> If you are unable to comply with Safety Recommendations P-10-2 (Urgent) and P-10-3 (Urgent) to accurately determine the maximum allowable operating pressure of Pacific Gas and Electric Company natural gas transmission lines in class 3 and class 4 locations and class 1 and class 2 high consequence areas that have not had a maximum allowable operating pressure established through prior

hydrostatic testing, determine the maximum allowable operating pressure with a spike test followed by a hydrostatic pressure test.

The NTSB notes PG&E's progress to address this issue, which includes (1) testing a total of about 39.5 miles of Line 132 (about 37 miles of which were tested in 2011), (2) conducting strength tests at 1.7 times the maximum allowable operating pressure plus a 10 percent spike test where possible, and (3) providing the CPUC with monthly reports on the status of its strength testing program. PG&E will continue action on this issue in two phases. Phase 1 includes testing or verifying records of 185 miles in 2012, 204 miles in 2013, and 158 miles in 2014. Phase 1 strength testing will address the following types of pipes:

- Pre-1970, low-frequency electric resistant welded, flash welded, single submerged arc welded, furnace butt welded, and lap welded pipe operating between 20 percent and 30 percent specified minimum yield strength (SMYS) in urban areas.

- All urban-area pipes operating at or above 30 percent SMYS, unless it has been scheduled for replacement or an adequate strength test for the pipe exists.

Phase 2, beginning in 2015, will include strength testing the following 1,700 additional miles of pipeline:

- All urban area pipes operating below 30 percent SMYS, unless it has been scheduled to be replaced or an adequate strength test for the pipe exists.

- All identified pipe not previously strength tested or replaced in Phase 1, which includes pipe located in Class 1 non-HCA, rural areas, unless an adequate pressure test exists for the pipe.

Pending completion of these efforts, Safety Recommendation P-10-4 is classified "Open—Acceptable Response."

P-11-3

Require your control room operators to notify, immediately and directly, the 911 emergency call center(s) for the communities and jurisdictions in which your transmission and/or distribution pipelines are located, when a possible rupture of any pipeline is indicated.

The NTSB notes that PG&E's supervisory control and data acquisition (SCADA) operating data and alarms are now the basis for all 911 notifications to ensure prompt and immediate notification to 911 emergency call centers. PG&E established 911 notification criteria based on the SCADA alarms received, such as loss of pressure, the magnitude and time rate of pressure loss, and changes in flow rates. Whenever the parameters exceed designated thresholds, gas control room operators are first, to contact 911; then, to focus on handling the event (for example, a rupture, valve failure, or venting gas); and, finally, to contact corporate management. This revised policy satisfies Safety Recommendation P-11-3, which is classified "Closed—Acceptable Action."

P-11-24

> Revise your work clearance procedures to include requirements for identifying the likelihood and consequence of failure associated with the planned work and for developing contingency plans.

The NTSB understands that PG&E is nearing completion of its work clearance procedure and will issue the revised procedure to all employees involved in the gas clearance process before the end of 2012. PG&E will also improve its clearance work processes by creating a distribution control center by the end of 2012. The center will oversee a uniform distribution clearance process nearly identical to the transmission process. In addition, PG&E's utility performance improvement team (Lean Six Sigma experts), in conjunction with gas control, engineering, and field maintenance, are now writing the distribution clearance process, which is expected to be completed in the third quarter of 2012. Pending completion of these efforts, Safety Recommendation P-11-24 is classified "Open—Acceptable Response."

P-11-25

> Establish a comprehensive emergency response procedure for responding to large-scale emergencies on transmission lines; the procedure should (1) identify a single person to assume command and designate specific duties for supervisory control and data acquisition staff and all other potentially involved company employees; (2) include the development and use of trouble-shooting protocols and checklists; and (3) include a requirement for periodic tests and/or drills to demonstrate the procedure can be effectively implemented.

The NTSB is pleased that PG&E established a comprehensive emergency response procedure for responding to large-scale emergencies involving transmission lines, which includes the use of troubleshooting protocols and checklists, and which requires periodic tests and/or drills to demonstrate that the procedure can be effectively implemented. Accordingly, Safety Recommendation P-11-25 is classified "Closed—Acceptable Action."

P-11-26

> Equip your supervisory control and data acquisition system with tools to assist in recognizing and pinpointing the location of leaks, including line breaks; such tools could include a real-time leak detection system and appropriately spaced flow and pressure transmitters along covered transmission lines.

The NTSB understands that PG&E is implementing three significant projects that will expand the current SCADA capability to predict and then manage abnormal events on the transmission and distribution system. These three projects are (1) implementation of an automated valve program, (2) OSIsoft PI Data Historian integration with SCADA and a graphic information system, and (3) creation of a distribution control center; they are to be the foundation of the broad initiative PG&E has undertaken to build a comprehensive controls framework to move from monitoring and reacting to one that is predictive and proactive. Pending completion of these efforts, Safety Recommendation P-11-26 is classified "Open—Acceptable Response."

P-11-27

> Expedite the installation of automatic shutoff valves and remote control valves on transmission lines in high consequence areas and in class 3 and 4 locations, and space them at intervals that consider the factors listed in Title 49 *Code of Federal Regulations* 192.935(c).

The NTSB notes that PG&E is modernizing its pipeline system and using technology to help identify and respond to potential issues. PG&E expects to complete installation of the automatic shutoff valves and remote control valves by the end of 2014. Further, PG&E will enhance its SCADA information system by including additional information related to pipeline pressures, valve positions, and gas flow rates. Pending completion of these efforts, Safety Recommendation P-11-27 is classified "Open—Acceptable Response."

P-11-28

> Revise your postaccident toxicological testing program to ensure that testing is timely and complete.

The NTSB is pleased that PG&E revised its testing processes to address the timeliness in conducting post-accident toxicological testing and the breadth of the tested population in a U.S. Department of Transportation–reportable event. Accordingly, Safety Recommendation P-11-28 is classified "Closed—Acceptable Action."

P-11-29

> Assess every aspect of your integrity management [IM] program, paying particular attention to the areas identified in this investigation, and implement a revised program that includes, at a minimum, (1) a revised risk model to reflect the Pacific Gas and Electric Company's actual recent experience data on leaks, failures, and incidents; (2) consideration of all defect and leak data for the life of each pipeline, including its construction, in risk analysis for similar or related segments to ensure that all applicable threats are adequately addressed; (3) a revised risk analysis methodology to ensure that assessment methods are selected for each pipeline segment that address all applicable integrity threats, with particular emphasis on design/material and construction threats; and (4) an improved self-assessment that adequately measures whether the program is effectively assessing and evaluating the integrity of each covered pipeline segment.

The NTSB notes that PG&E completed enhancements to its IM program by revising its risk model and integrity management program and by implementing information systems to ensure that all applicable threats are adequately addressed. PG&E planned to have converted its paper records and databases documenting gas transmission leak history into a single electronic database by mid-2012, including all documents designed to identify and report historical weld seam leaks. PG&E retained a consultant to provide an updated internal corrosion and a stress corrosion threat identification procedure to be integrated into PG&E's Transmission IM program in mid-2012 and to issue recommendations that PG&E plans to implement in 2012 and 2013.

Pending completion of this work, Safety Recommendation P-11-29 is classified "Open—Acceptable Response."

P-11-30

> Conduct threat assessments using the revised risk analysis methodology incorporated in your integrity management program, as recommended in Safety Recommendation P-11-29, and report the results of those assessments to the California Public Utilities Commission and the Pipeline and Hazardous Materials Safety Administration.

The NTSB notes that, when PG&E's overall risk model is updated to more expressly consider threats such as internal corrosion, stress corrosion cracking, fatigue, and interacting threats, the updated risk model will be included in future threat assessments and integrated into future baseline assessment plans. Pending completion of these efforts, Safety Recommendation P-11-30 is classified "Open—Acceptable Response."

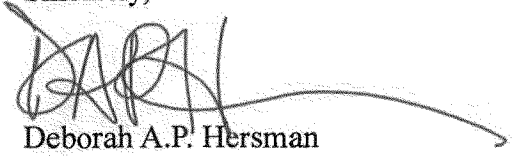
P-11-31

> Develop, and incorporate into your public awareness program, written performance measurements and guidelines for evaluating the plan and for continuous program improvement.

The NTSB notes that PG&E has developed written public awareness performance measurements and guidelines for evaluating the plan and for continuous improvement, in cooperation with the CPUC. In 2012, PG&E will further evaluate the effectiveness of its public awareness communication strategy based on its survey findings, as well as initiate an advertising campaign to reach its broad stakeholder audience. Pending completion of these efforts, Safety Recommendation P-11-31 is classified "Open—Acceptable Action."

Thank you for this comprehensive update. The NTSB would appreciate receiving periodic updates as action continues to address Safety Recommendations P-10-3 and -4; P-11-24; and P-11-26, -27, and -29 through -31. We encourage you to submit updates electronically at the following e-mail address: correspondence@ntsb.gov. If a response includes attachments that exceed 5 megabytes, please e-mail us at the same address for instructions. To avoid confusion, please do not submit both an electronic copy and a hard copy of the same response.

Sincerely,



Deborah A.P. Hersman
Chairman