



**Pacific Gas and  
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June 18, 2013

Honorable Deborah A.P. Hersman  
National Transportation Safety Board  
490 L'Enfant Plaza, SW  
Washington, DC 20594

Re: NTSB Safety Recommendations Status Update for P-11-29 and P-11-30

Dear Chairman Hersman:

Pacific Gas and Electric Company (PG&E) continues to make substantial progress implementing the safety recommendations outlined by the NTSB's investigation of the September 2010 San Bruno pipeline accident. This status report provides details on the actions taken to complete the NTSB's recommendations for PG&E's Integrity Management Program (P-11-29 and P-11-30).

PG&E met with the NTSB staff on May 28, 2013, to provide an update on the completion of these recommendations and the processes in place to support continuous improvement of PG&E's integrity management program.

PG&E has completed the assessment of every aspect of its Integrity Management Program (P-11-29) and implemented a revised program that includes: a revised risk model; consideration of all defect and leak data for the life of each pipeline; a revised risk assessment methodology; and an improved self-assessment process. As part of this work, PG&E updated eleven risk management procedures and added four new procedures.

For the recommendations on Threat Assessment (P-11-30), PG&E has completed conducting the threat assessments using the revised risk analysis methodology as described in Recommendation P-11-29 and finalized the 2012 HCA Assessment Plan on April 29, 2013. PG&E provided the results of those assessments to the California Public Utilities Commission and the Pipeline and Hazardous Materials Safety Administration on June 10, 2013.

The attached status report provides additional details of the actions PG&E has taken to address these recommendations. PG&E requests the NTSB to close Safety Recommendations P-11-29 and P-11-30 with acceptable action.

PG&E thanks the NTSB for both its continuing guidance and leadership as the company works to address the remaining safety recommendations.

Please contact me directly if you have any questions.

Sincerely,

**NTSB SAFETY RECOMMENDATIONS**  
**UPDATE ON PG&E'S ACTIONS FOR RECOMMENDATIONS P-11-29 AND P-11-30**  
**JUNE 12, 2013**

**P-11-29: Integrity Management Program**

Assess every aspect of your integrity management 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, and 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.

**Update for P-11-29:**

PG&E has completed the assessment of every aspect of its Integrity Management Program and implemented a revised program that includes: a revised risk model; consideration of all defect and leak data for the life of each pipeline; a revised risk assessment methodology; and an improved self-assessment process.

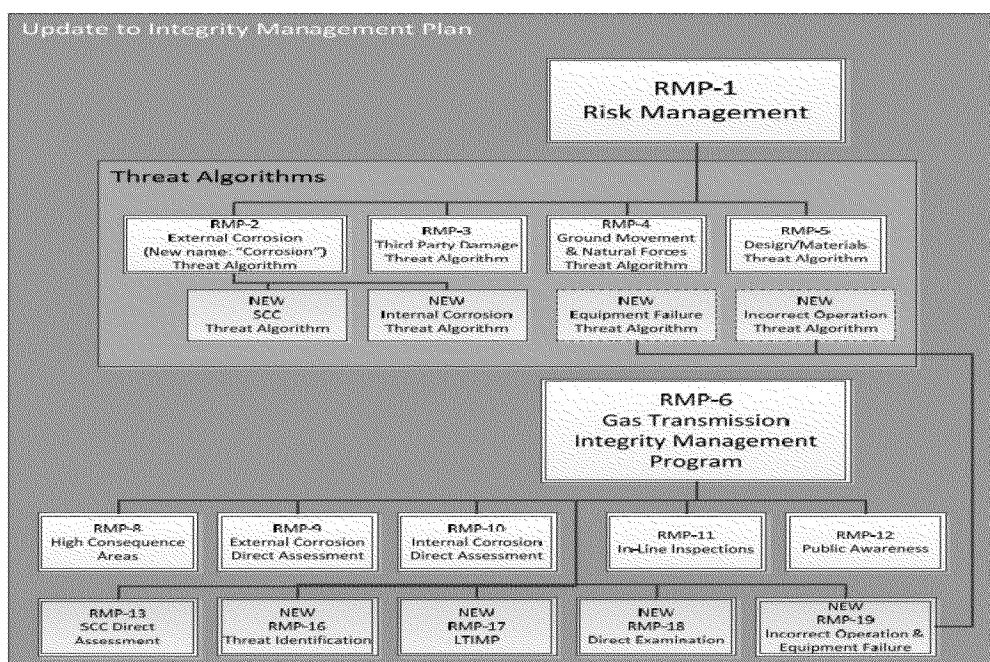
PG&E completed this work with help from several leading integrity management consultants and has implemented numerous enhancements to its program. Exhibit 1 is a letter from Det Norske Veritas (DNV) which provides an executive summary of the review completed on PG&E's integrity program. In addition, PG&E worked with Kiefner & Associates to update the threat identification processes for manufacturing and construction threats, cyclic fatigue and interactive threats. Exhibit 2 through 4 include the reports from Kiefner & Associates detailing the work performed.

Based upon these efforts, PG&E updated eleven of its risk management procedures including its Integrity Management Program (RMP-6) and added four new procedures. To ensure all applicable threats are addressed, PG&E enhanced its threat identification procedures and completed an extensive data gathering effort on its historic leakage records to assure consideration of all defect and leak data for the life of each pipeline, including construction, and risk analysis for similar or related segments. PG&E also revised its risk analysis methodology to ensure assessment methods are selected for each pipeline segment that address all applicable integrity threats, specifically focusing on design, material and construction threats.

PG&E documented these changes to the existing integrity management procedures through a change form process. PG&E is providing a copy of these change forms as documentation of the changes it performed to its program (RMP 1-6, 8-11, 13 and 16) as provided in Exhibit 5. In addition, PG&E is providing a complete copy of its revised procedures including the four new procedures it established as part of its overall evaluation it completed in 2012 (Exhibit 6).

The revised organizational structure of PG&E's program documents is shown in Figure 1 below.

**Figure 1: Integrity Management Plan**



To assure that the integrity related procedures are maintained and continuously improved, each procedure is tracked in PG&E's document tracking system and has been scheduled for an annual review.

Furthermore, PG&E continues to improve its record keeping systems and is addressing data quality through the MAOP Data Validation Project. Attached is a quality assurance document that was shared with the CPUC on April 9, 2013 which details PG&E data quality efforts (Exhibit 7).

In addition, the leak verification project was established to integrate historic leak records into an electronic repository so that improved integrity decision making could be performed and incorporated into this year's risk algorithm.

PG&E has also updated its procedure to address how it selects assessment methods. This updated methodology is listed in RMP 6, Section 9.

### **NEW PROCEDURES**

RMP-16, '*Threat Identification*,' was created to focus on PG&E's threat identification process. PG&E has aligned its pipeline threats nomenclature for the nine threat categories with Industry best practices and decision trees have been created to identify each threat.

Within RMP-16, improvements have been made to PG&E's threat identification processes. Some of these changes include:

- Consideration of liquid water, water vapor, and corrosive sources in the internal corrosion threat identification process. Increased reliance on internal corrosion related leak and inspection data to evaluate the threat.
- Separate manufacturing threat identification procedure for seam and body of pipe.
- Addition of a stability determination evaluation process for manufacturing threats based upon post construction pressure testing.
- Enhanced procedures to address interactive threats including cyclic fatigue.
- Added consideration of near-neutral stress corrosion cracking as a threat.

- Improved threat identification procedures for equipment and incorrect operations threat.

The other new procedures address the following:

- RMP-17 - post assessment process
- RMP-18 - establishment of a direct examination procedure
- RMP-19 - enhancements to the risk algorithm

## RISK MODEL

PG&E has completed the implementation of a revised risk model to reflect actual recent experience data on leaks, failures, and incidents (documented in changes to the procedures related to risk (RMP 1-5, RMP 19) in 2012). The results from the model were published in PG&E's latest Assessment Plan which was approved on 4/29/2013 for PG&E.

PG&E's revised Risk Algorithm is as follows:

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$$\text{Likelihood of Failure} = \text{EC} + \text{IC} + \text{SCC} + \text{TPD} + \text{WROF} + \text{M\&C} + \text{E} + \text{IO}$$

Where:

EC	=	External Corrosion Threat
IC	=	Internal Corrosion Threat
SCC	=	Stress Corrosion Cracking Threat
TPD	=	Third Party Threat (Including 1 <sup>st</sup> and 2 <sup>nd</sup> party threat)
WROF	=	Weather & Outside Force Threat
M&C	=	Manufacturing & Construction Threat
E	=	Equipment Threat
IO	=	Incorrect Operations Threat

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Four new threat categories were added to the risk model. They include:

- NEW Internal Corrosion (documented in RMP-02)
- NEW Stress Corrosion Cracking (documented in RMP-02)
- NEW Equipment Failure (documented in RMP-19)
- NEW Incorrect Operations (documented in RMP-19)

In addition, weighting between the LOF threat categories were discontinued so that risks from all the pipeline threat categories have equal potential to drive increased risk. This allows for incidents that have had little or no activity in the past (such as SCC) to impact risk.

PG&E has also supplemented its individual LOF threat categories algorithms so that they consider a variety of PG&E specific operating data, such as: historical leakage data that was identified by the Leakage Verification Project, recent leak information from the various field organizations, incident data, equipment failure information, gas quality data, SCADA information, USA Ticket data and other field inspection reports as part of its evaluation process.

## METRICS

PG&E has implemented an improved self-assessment that adequately measures whether the program is effectively assessing and evaluating the integrity of each covered pipeline segment. Performance metrics based on leak and incident data by cause (based on ASME B31.8S-2004 threat categories) as shown in Table 1 support evaluation of the effectiveness of the program.

**Table 1**

<b>Threat</b>	<b>Metric</b>
EC	Leaks/mile
IC	Leaks/mile
SCC	Leaks/mile
M&C	Leaks/mile
WROF	Leaks/mile
TPD	Dig in rate/1000 USA tags
E	Number of inoperable valves
IO	Number of over-pressurization events

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**P-11-30: Threat Assessment**

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.

**Update for P-11-30:**

PG&E has completed conducting the threat assessments using the revised risk analysis methodology as described in Recommendation P-11-29 and finalized the 2012 HCA Assessment Plan on April 29, 2013. PG&E has communicated the results to the California Public Utilities Commission and the Pipeline and Hazardous Materials Safety Administration on June 10, 2013.

As a result of the new threat identification and risk analysis methodology, the number of miles to be assessed for internal corrosion, stress corrosion cracking and manufacturing (seam) threat, have increased as shown in Table 2. These numbers are provided to demonstrate the impact of the enhanced methodology on PG&E's integrity management program. As new threat data is continuously analyzed and assessments are completed, the data will continue to change.

**Table 2**

<b>Threat</b>	<b>HCA Mileage (Historic Threat Id)</b>	<b>Master HCA Mileage (Revised Threat Id)</b>
Internal Corrosion	34.1	245
Stress Corrosion Cracking	5.24	49
Manufacturing (Seam)	5.97	161