



February 26, 2014

PG&E Letter DCL-14-015

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

10 CFR 50.4

Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2

Pacific Gas and Electric Company's Second Six-Month Status Report in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)

References:

1. NRC Order Number EA-12-051, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," dated March 12, 2012
2. PG&E Letter DCL-13-011, "Pacific Gas and Electric Company's Overall Integrated Plan in Response to March 12, 2012, Commission Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)," dated February 27, 2013
3. NRC Letter, "Diablo Canyon Power Plant, Unit Nos. 1 and 2 – Interim Staff Evaluation and Request for Additional Information Regarding the Overall Integrated Plan for Implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation (TAC Nos. MF0963 and MF0964)," dated November 25, 2013
4. PG&E Letter DCL-13-073, "Response to Request for Additional Information Regarding Overall Integrated Plan in Response to March 12, 2012, Commission Order to Modify License with Regards to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)," dated July 18, 2013

Dear Commissioners and Staff:

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued Reference 1 to Pacific Gas and Electric Company (PG&E) directing PG&E to have a reliable indication of the water level in Diablo Canyon Power Plant's spent fuel pools (SFP). Specific requirements are outlined in Reference 1, Attachment 2.



Pursuant to Reference 1, Section IV, Condition C, PG&E submitted its overall integrated plan (OIP) for reliable SFP instrumentation in Reference 2.

Pursuant to Reference 1, Section IV, Condition C.2, the enclosure to this letter provides PG&E's second six-month status report of its OIP. The enclosure also includes updates to the responses to the NRC's requests for additional information in Reference 4 and provides responses to Reference 3.

PG&E makes no regulatory commitments (as defined by NEI 99-04) in this letter. This letter includes no revisions to existing regulatory commitments.

If you have any questions, or require additional information, please contact Mr. Patrick Nugent at (805) 781-9786.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on February 26, 2014.

Sincerely,

Barry S. Allen
Site Vice President

crlb/SAPN 50465912-12

Enclosure

cc: Diablo Distribution
cc:/enc: Eric E. Bowman, NRC/NRR/DPR/PGCB
Marc L. Dapas, NRC Region IV Administrator
Thomas R. Hipschman, NRC Senior Resident Inspector
James S. Kim, NRR Project Manager
Jessica A. Kratchman, NRC/NRR/JLD/PMB
Eric J. Leeds, NRC/NRR Director
Eileen M. Mckenna, NRC/NRO/DSRA/BPTS

**Pacific Gas and Electric Company's Second Six-Month Status Report
 for the Implementation of Order EA-12-051**

1 Introduction

Pacific Gas and Electric Company (PG&E) developed an overall integrated plan (OIP) (Reference 1 [Refer to Section 10 of this enclosure for a list of references.]), to achieve compliance with the requirements described in NRC Order EA-12-051 (Reference 2), Attachment 2. This enclosure provides an update of milestone accomplishments since submittal of the OIP, including any changes to the compliance method, schedule, or need for relief and the basis, if any. This enclosure also provides an update to the status of responses to requests for additional information (RAIs) provided in Reference 3 and PG&E's responses to Reference 4.

2 Milestone Accomplishments

The following milestones have been completed since the submittal of Reference 5 and are current as of January 31, 2014:

PG&E has completed the commencement of Unit 1 and Unit 2 engineering and design.

3 Milestone Schedule Status

The following table provides an update to the milestone schedule. It provides the activity status of each item, and whether the expected completion date has changed. The dates are subject to change as design and implementation details are developed.

There were no changes to the original target completion dates.

Milestone	Original Target Completion Date	Activity Status	Target Completion Date Changes
Submit 60-day progress report	10/2012	Complete	
Submit overall integrated plan	2/2013	Complete	
Submit six-month updates			
Update 1	8/2013	Complete	
Update 2	2/2014	Complete	
Update 3	8/2014	Not started	
Update 4	2/2015	Not started	
Update 5	8/2015	Not started	
Update 6	2/2016	Not started	
Update 7	8/2016	Not started	

Milestone	Original Target Completion Date	Activity Status	Target Completion Date Changes
July 3, 2013 Request for Additional Information			
Submit response	7/22/2013	Complete	
Commence Unit 1 engineering and design	3/31/13	Complete	
Commence Unit 2 engineering and design	3/31/13	Complete	
Develop Unit 1 design	3/31/14	Started	
Develop Unit 2 design	3/31/14	Started	
Receipt of Unit 1 spent fuel pool (SFP) instruments	12/31/14	Not Started	
Receipt of Unit 2 SFP instruments	12/31/14	Not Started	
Complete Unit 1 SFP instrumentation procedures and training	10/29/15	Not Started	
Complete Unit 2 SFP instrumentation procedures and training	5/31/16	Not Started	
Unit 1 SFP instruments operational	10/29/15	Not Started	
Unit 1 SFP instruments operational	5/31/16	Not Started	

4 Changes to Compliance Method

None

5 Need for Relief and Basis for the Relief

PG&E expects to comply with the implementation date in the Order. No relief is being requested at this time.

6 Open Items from Overall Integrated Plan

None

7 Open Items from the July 3, 2013, NRC Request for Additional Information

PG&E submitted Reference 3 in response to Reference 6. In its response, PG&E committed to provide a status update of the information necessary to complete its response to the RAIs.

The following provides a summary and status of the RAI open items.

RAI-2

The specific locations of the probes will be provided in the six-month update following completion of detailed design.

Status:

Refer to Section 8 of this enclosure, Interim Staff Evaluation (ISE) RAI 2.

RAI-3

- (1) Final dimensions of the pedestal and bracket will be provided in the six-month update following completion of detailed design.

Status:

Detailed design has not been completed.

- (2) Final dimensions of the bracket will be provided in the six-month update following completion of detailed design.

Status:

Detailed design has not been completed.

RAI-7

- (1) An estimate of the expected instrument channel accuracy under normal and beyond-design-basis conditions will be provided in the six-month update following completion of detailed design.

Status:

Refer to Section 8 of this enclosure, ISE RAI 13.

- (2) The calibration procedure, and the methodology and basis for establishing both the criteria indicating the need for recalibration, and the acceptance criterion to be used with the procedure, will be established during the design verification phase. The methodology for defining these criteria will be provided in the six-month update following completion of detailed design.

Status:

Refer to Section 8 of this enclosure, ISE RAI 13.

RAI-8

- (1) Details of the capabilities and provisions of the level instrumentation for periodic calibration and testing will be established during the detailed design phase. A description of these features and the way they will support in-situ testing will be provided in the six-month update following completion of detailed design.

Status:

Refer to Section 8 of this enclosure, ISE RAI 14.

- (2) A description of how the instrument channel design provides for routine in-situ testing and calibration will be provided in the six-month update following completion of detailed design.

Status:

Refer to Section 8 of this enclosure, ISE RAI 14.

- (3) Details of functional checks and instrument channel calibrations will be determined during the detailed design phase. A description of how functional checks and calibration tests will be performed, and the frequency at which they will be conducted, will be provided in the six-month update following completion of detailed design. An explanation of how these surveillances will be incorporated into the plant surveillance program will be included.

Status:

Refer to Section 8 of this enclosure, ISE RAI 14.

- (4) The preventative maintenance tasks required to be performed during normal operation, and the planned surveillance intervals will be determined during the detailed design phase. A description of these tasks and intervals will be provided in the six-month update following completion of detailed design.

Status:

Refer to Section 8 of this enclosure, ISE RAI 14.

RAI-10

A list of the operating (both normal and abnormal response) procedures, calibration/test procedures, maintenance procedures, and inspection procedures will be provided in the six-month update following completion of detailed design.

Status:

Refer to Section 8 of this enclosure, ISE RAI 16.

RAI-11

- (1) PG&E will provide a description of the maintenance and testing program, and a description of the plans for ensuring that necessary channel checks, functional tests, periodic calibration, and maintenance will be conducted for the level measurement system and its supporting equipment. The descriptions will be provided in the six-month update following completion of detailed design.

Status:

Refer to Section 8 of this enclosure, ISE RAI 17.

- (2) PG&E will implement measures to minimize the possibility of either the primary or backup channel being out of service for an extended period. Sufficient spares, components, and materials will be maintained to be able to repair or replace defective components in a short time. Descriptions of these measures will be provided in the six-month update following completion of detailed design.

Status:

Refer to Section 8 of this enclosure, ISE RAI 17.

- (3) PG&E will follow the NEI 12-02 guidance with regard to time during which one or more channels may be out of service, including compensatory actions. A description of the compensatory actions will be provided in the six-month update following completion of detailed design.

Status:

Refer to Section 8 of this enclosure, ISE RAI 17.

8 Requests for Additional Information from the Interim Staff Evaluation

Reference 4 requested PG&E to provide responses to RAIs in the six-month updates as they become available but no later than April 30, 2015.

The following is the status of PG&E's response to the ISE RAIs:

ISE RAI 1

Please provide the results of the calculation used to determine the water elevation necessary for the pump's required NPSH to confirm that Level 1 has been adequately identified.

Response:

PG&E performed an evaluation to determine the water elevation necessary for the SFP cooling system pump's required net positive suction head (NPSH) to operate without cavitation at saturated conditions. The evaluation concluded that at saturation temperature and inventory reduced to the centerline of the SFP cooling system inlet pipe, there is a margin of approximately nine feet of NPSH available to both the Unit 1 and Unit 2 SFP pumps.

NEI 12-02, Section 2.3.1 specifies Level 1 to represent the higher of the following two points:

- The level at which reliable suction loss occurs due to uncovering of the coolant inlet pipe, weir or vacuum breaker (depending on the design), or
- The level at which the water height, assuming saturated conditions, above the centerline of the cooling pump suction provides the required NPSH specified by the pump manufacturer or engineering analysis.

Reference 3 specifies Level 1 to be the first of these two points. Based on the above, PG&E considers this item to be closed.

ISE RAI 2 (RAI 2 in Reference 3)

Please provide additional information describing how the proposed arrangement of the routing of the cabling between the sensor probes in the SFP to the sensor electronics panels and from there to the level displays meets the Order requirement to arrange the SFP level instrument channels in a manner that provides reasonable protection of the level indication function against missiles that may result from damage to the structure over the SFP.

Response:

Detailed design work is in progress. PG&E will provide the specific locations of the probes and information regarding cable routing compliance with the Order in a future six-month update.

ISE RAI 3

Please provide the results of the analyses used to verify the design criteria and methodology for seismic testing of the SFP instrumentation and the electronics units, including, design basis maximum seismic loads and the hydrodynamic loads that could result from pool sloshing or other effects that could accompany such seismic forces.

Response:

The system vendor is in the process of completing final testing and design review. PG&E will provide information regarding design criteria and seismic testing in a future six-month update following the completion of final testing and design review.

ISE RAI 4

For each of the mounting attachments required to attach SFP Level equipment to plant structures, please describe the design inputs, and the methodology that was used to qualify the structural integrity of the affected structures/equipment.

Response:

Detailed design work is in progress. PG&E will provide the design inputs and methodology used to qualify the structural integrity of affected structures/equipment in a future six-month update following completion of detailed design.

ISE RAI 5

Please describe the augmented quality assurance process to be used to meet the augmented quality requirements of the Order.

Response:

Westinghouse followed its Quality Management System to meet the augmented quality requirements identified in the Order as applicable to the non-safety augmented quality classification of the SFP instrumentation system (SFPIS). SFPIS specific requirements are identified in WNA-PD-00319-W5PP, "Spent Fuel Pool Instrumentation Systems Project Plan."

The system vendor is in the process of completing final testing and design review. PG&E will provide information regarding augmented quality assurance in a future six-month update following the completion of final testing and design review.

ISE RAI 6

Please provide analysis of the maximum expected radiological conditions (dose rate and total integrated dose) to which the transmitter electronics will be exposed. Also, provide documentation indicating the total integrated dose the electronics for this equipment is capable of withstanding. Discuss the time period over which the analyzed total integrated dose was applied.

Response:

PG&E will perform and provide an analysis on radiological exposure in a future six-month update.

ISE RAI 7

Please provide information indicating a) the temperature ratings for all system electronics (including sensor electronics, system electronics, transmitter, receiver and display) and whether the ratings are continuous duty ratings; and, b) the maximum expected temperature and relative humidity conditions in the room(s) where the sensor electronics will be located under BDB conditions, and when there will be no ac power available to run Heating, Ventilation, and Air Conditioning (HVAC) systems.

Response:

Detailed design work is in progress. PG&E will provide requested temperature ratings, environmental conditions in the room(s) where the sensor electronics will be located under beyond-design-basis (BDB) conditions, and when no alternating current (ac)

power will be available to run heating, ventilation, and air conditioning (HVAC) systems in a future six-month update.

ISE RAI 8

Please provide information indicating the maximum expected relative humidity in the room in which the sensor electronics will be located under BDB conditions, in which there is no ac power available to run HVAC systems, and whether the sensor electronics is capable of continuously performing its required functions under this expected humidity condition.

Response:

Detailed design work is in progress. PG&E will provide the maximum expected relative humidity in the room in which the sensor electronics will be located under BDB conditions, in which no ac power will be available to run HVAC systems, and whether the sensor electronics will be capable of continuously performing its required functions under this expected humidity condition in a future six-month update.

ISE RAI 9

Please provide the following:

- a) Please provide the following: Information describing the evaluation of the sensor electronics design, the shock test method, test results, and forces applied to the sensor electronics applicable to its successful tests demonstrating the testing provides an appropriate means to demonstrate reliability of the sensor electronics under the effects of severe shock.*
- b) Information describing the evaluation of the sensor electronics design, the vibration test method, test results, the forces and their frequency ranges and directions applied to the sensor applicable to its successful tests, demonstrating the testing provides an appropriate means to demonstrate reliability of the sensor electronics under the effects of high vibration.*

Response:

The system vendor is in the process of completing final testing and design review. Information regarding shock and vibration testing and design criteria will be provided in a future six-month update.

ISE RAI 10

Please provide analysis of the seismic testing results and show that SFP level instrument performance reliability, following exposure to simulated seismic conditions representative of the environment anticipated for the SFP structures at DCP, Units 1 and 2, has been adequately demonstrated. Include information describing the design inputs and methodology used in any analyses of the mountings of electronic equipment onto plant structures, as requested in RAI #4 above.

Response:

The system vendor is in the process of completing final testing and design review. Information regarding seismic testing results and design criteria will be provided in a future six-month update.

ISE RAI 11

Please provide the final configuration of the power supply source for each channel so the staff may conclude the two channels are independent from a power supply assignment perspective.

Response:

Detailed design work is in progress. Information regarding power supply independence will be provided in a future six-month update.

ISE RAI 12

Please provide the results of the calculation depicting the battery backup duty cycle requirements demonstrating that battery capacity is sufficient to maintain the level indication function until offsite resource availability is reasonably assured.

Response:

Power consumption calculation WNA-CN-00300-GEN demonstrates that the SFPIS will last a minimum of three days from a fully charged battery after ac power loss. The calculations include design and aging margin.

Three days of battery power is adequate because backup power from FLEX strategies is expected to be available to supply the instrumentation after this time, as stated in Reference 7. Based on the above, PG&E considers this item to be closed.

ISE RAI 13 (RAI 7 in Reference 3)

Please provide the following:

a) An estimate of the expected instrument channel accuracy performance under both (a) normal SFP level conditions (approximately Level 1 or higher) and (b) at the BDB conditions (i.e., radiation, temperature, humidity, post-seismic and post-shock conditions) that would be present if the SFP level were at the Level 2 and level 3 datum points.

b) A description of the methodology that will be used for determining the maximum allowed deviation from the instrument channel design accuracy under normal operating conditions. The NRC staff understands this allowed deviation will serve as an acceptance criterion for a calibration procedure to alert operators and technicians that the channel requires adjustment to within normal design accuracy.

Response:

a) The channel accuracy for each SFPIS instrument channel is ± 3 inches for the full level measurement range. This covers the normal SFP surface level or higher to within 6 inches of the fuel assembly under both normal and BDB conditions. More details regarding the requirements on measurement accuracy are defined in the Westinghouse design specification document WNA-DS-02957-GEN (Proprietary) and Westinghouse channel accuracy calculation document, WNA-CN-00301-GEN (Proprietary).

b) The channel accuracy requirements are identified in WNA-DS-02957-GEN (Proprietary) and demonstrated by the channel accuracy calculation, WNA-CN-00301-GEN (Proprietary). Both SFP primary and backup redundant sensor electronics require periodic calibration verification to check that the channel's measurement performance is within the specified tolerance (± 3 inches). If the difference is larger than the allowable tolerance during the verification process, an electronic output verification/calibration will be required. If the electronic output verification/calibration does not restore the performance, a calibration adjustment will be required.

The electronic output verification/calibration will verify electronics are working properly using simulated probe signals.

The calibration adjustment is performed to restore level measurement accuracy within the acceptance criteria at 0, 25, 50, 75, and 100 percent points of the full span.

The calibration acceptance criteria and procedures are defined in the proprietary Westinghouse procedure WNA-TP-04709-GEN. Based on the above, PG&E considers this item to be closed.

ISE RAI 14 (RAI 8 in Reference 3)

Please provide the following:

- a) *A description of the capability and provisions the proposed level sensing equipment will have to enable periodic testing and calibration, including how this capability enables the equipment to be tested in-situ.*
- b) *A description of the way such testing and calibration will enable the conduct of regular channel checks of each independent channel against the other, and against any other permanently installed SPF level instrumentation.*
- c) *A description of the calibration tests and functional checks to be performed and the frequency at which they will be conducted. Discuss how these surveillances will be incorporated into the plant surveillance program.*
- d) *A description of the preventive maintenance tasks are required to be performed during normal operation, and the planned maximum surveillance interval that is necessary to ensure the channels are fully conditioned to accurately and reliably perform their functions when needed.*

Response:

PG&E will provide information regarding the calibration, testing and maintenance activities associated with the SFP instrumentation in a future six-month update following completion of detailed design.

ISE RAI 15

For the SFP level instrumentation alternate display located outside the main control room, please describe the evaluation used to validate the alternate display location can be accessed without unreasonable delay following a BDB event. Include the time available for personnel to access the alternate display location as credited in the evaluation, as well as the actual time (e.g., based on walk-through) that it will take for personnel to access the display locations. Additionally, include a description of the radiological and environmental conditions on the paths personnel might take. Describe whether the alternate display location remains habitable for radiological, heat and humidity, and other environmental conditions following a BDB event. Describe whether personnel are continuously stationed at the alternate display location or monitor the display periodically.

Response:

The alternate display will be located near the auxiliary building control panel on the 85 foot elevation, which is a normally manned location separate from the main control room.

Detailed design work is in progress. PG&E will provide the maximum expected radiological, heat, humidity, and other environmental conditions for the alternate display location following a BDB event, and information concerning timing and accessibility from the main control room in a future six-month update.

ISE RAI 16 (RAI 10 in Reference 3)

Please provide a list of the procedures addressing operation (both normal and abnormal response), calibration, test, maintenance, and inspection that will be developed for use of the SFP instrumentation. Include a brief description of the specific technical objectives to be achieved within each procedure.

Response:

PG&E will provide a list describing the procedures that will be developed for the SFP in a future six-month update following completion of detailed design.

ISE RAI 17 (RAI 11 in Reference 3)

Please provide the following:

- a) Further information describing the maintenance and testing program the licensee will establish and implement to ensure that regular testing and calibration is performed and verified by inspection and audit to demonstrate conformance with design and system readiness requirements. Include a description of plans to ensure necessary channel checks, functional tests, periodic calibration, and maintenance will be conducted for the level measurement system and its supporting equipment.*
- b) A description of the guidance in NEI 12-02 section 4.3 on compensatory actions for one or both non-functioning channels will be addressed.*
- c) A description of the planned compensatory actions to be taken in the event that one of the instrument channels cannot be restored to functional status within 90 days.*

Response:

PG&E will provide information regarding the maintenance and testing program in a future six-month update following completion of detailed design.

ISE RAI 18

Please provide a description of the in-situ calibration process at the SFP location that will result in the channel calibration being maintained at its design accuracy.

Response:

The calibration verification is performed by simulating a change in SFP level through the use of a tool for the fixed-type poolside mounting bracket. If the difference is larger than the allowable tolerance during this verification, an electronic output verification/calibration is required. This electronic output verification/calibration verifies that the electronics are working properly using simulated probe signals.

If the electronic output verification/calibration does not restore the performance, a calibration adjustment will be required to restore and verify level measurement accuracy at five points along the full span of the probe. This adjustment is performed outside of the SFP area using a calibration kit and does not require removal of components from the SFP pool or area.

The calibration verification, electronic output verification/calibration, and the calibration adjustment are defined in the proprietary Westinghouse procedure WNA-TP-04709-GEN. Based on the above, PG&E considers this item to be closed.

9 Potential Safety Evaluation Report Impacts

There are no potential impacts to the Draft Safety Evaluation Report identified at this time.

10 References

The following references support the updates to the OIP described in this document.

1. PG&E Letter DCL-13-011, "Pacific Gas and Electric Company's Overall Integrated Plan in Response to March 12, 2012, Commission Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)," dated February 27, 2013
2. NRC Order Number EA-12-051, "Issuance of Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation," dated March 12, 2012
3. PG&E Letter DCL-13-073, "Response to Request for Additional Information Regarding Overall Integrated Plan in Response to March 12, 2012, Commission Order to Modify Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)," dated July 18, 2013

4. NRC Letter, "Diablo Canyon Power Plant, Unit Nos. 1 and 2 – Interim Staff Evaluation and Request for Additional Information Regarding the Overall Integrated Plan for Implementation of Order EA-12-051, Reliable Spent Fuel Pool Instrumentation (TAC Nos. MF0963 and MF0964)," dated November 25, 2013
5. PG&E Letter DCL-13-080, "Pacific Gas and Electric Company's First Six-Month Status Report in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051)," dated August 22, 2013
6. NRC Letter, "Diablo Canyon Power Plant, Unit Nos. 1 and 2 – Request for Additional Information Regarding Overall Integrated Plan for Reliable Spent Fuel Pool Instrumentation (Order Number EA-12-051) (TAC Nos. MF0963 and MF0964)," dated July 3, 2013
7. PG&E Letter DCL-13-007, "Pacific Gas and Electric Company's Overall Integrated Plan in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)," dated February 27, 2013