



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

December 24, 2015

Mr. Edward D. Halpin  
Senior Vice President and  
Chief Nuclear Officer  
Pacific Gas and Electric Company  
Diablo Canyon Power Plant  
P.O. Box 56, Mail Code 104/6  
Avila Beach, CA 93424

SUBJECT: DIABLO CANYON POWER PLANT, UNITS 1 AND 2 – REGULATORY AUDIT PLANS FOR JANUARY 12-14, 2016, AUDIT AT WESTINGHOUSE FACILITY IN ROCKVILLE, MARYLAND, IN SUPPORT OF ALTERNATIVE SOURCE TERM, AND BEACON POWER DISTRIBUTION MONITORING SYSTEM METHODOLOGY LICENSE AMENDMENT REQUESTS (CAC NOS. MF6399 AND MF6400, AND MF6120 AND MF6121)

Dear Mr. Halpin:

By letter dated June 17, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15176A539), as supplemented by letters dated August 31, October 22, November 2, and November 6, 2015 (ADAMS Accession Nos. ML15243A363, ML15295A470, ML15321A235, and ML15310A522, respectively), Pacific Gas and Electric (PG&E, the licensee), submitted a license amendment request (LAR) to revise the licensing bases to adopt the alternative source term (AST) as allowed by Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.67, "Accident source term," for Diablo Canyon Power Plant (DCPP), Units 1 and 2.

Additionally, by letter dated April 16, 2015 (ADAMS Accession No. ML15107A333), PG&E submitted an LAR to revise the Best Estimate Analyzer for the Core Operations-Nuclear (BEACON) power distribution monitoring system methodology described in the DCPP Updated Final Safety Analysis Report Section 4.3.2.2, "Power Distribution," to the method described in WCAP-12472-P-A, Addendum 4, "BEACON Core Monitoring and Operation Support System." This LAR also proposes to revise Technical Specification (TS) 5.6.5, "Core Operating Limits Report (COLR)," Section b to replace WCAP-11596-P-A, "Qualification of the PHOENIX-P/ANC Nuclear Design System for Pressurized Water Reactor Cores," with U.S. Nuclear Regulatory Commission (NRC)-approved WCAP-16045-P-A, "Qualification of the Two-Dimensional Transport Code PARAGON," and NRC-approved WCAP-16045-P-A, Addendum 1-A, "Qualification of the NEXUS Nuclear Data Methodology."

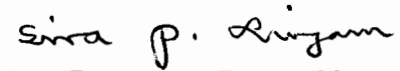
To support its safety evaluations, the NRC staff will conduct an audit at the Westinghouse facility in Rockville, Maryland, during the week of January 12-14, 2016. Enclosure 1 provides an audit plan to support the review of the AST LAR and Enclosure 2 provides an audit plan to support the review of the BEACON LAR.

E. Halpin

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If you have any questions, please contact me at 301-415-1564 or via e-mail at [Siva.Lingam@nrc.gov](mailto:Siva.Lingam@nrc.gov).

Sincerely,



Siva P. Lingam, Project Manager  
Plant Licensing Branch IV-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-275 and 50-323

Enclosures:

1. Audit Plan for AST LAR
2. Audit Plan for BEACON LAR

cc w/encls: Distribution via Listserv

REGULATORY AUDIT PLAN FOR JANUARY 12-14, 2016, AUDIT AT WESTINGHOUSE  
FACILITY IN ROCKVILLE, MARYLAND, TO SUPPORT REVIEW OF  
ALTERNATIVE SOURCE TERM LICENSE AMENDMENT REQUEST  
PACIFIC GAS AND ELECTRIC COMPANY  
DIABLO CANYON POWER PLANT, UNITS 1 AND 2  
DOCKET NOS. 50-275 AND 50-323

Background

The U.S. Nuclear Regulatory Commission (NRC) staff is currently engaged in a review of a license amendment request (LAR) for the Diablo Canyon Power Plant (DCPP), Units 1 and 2. By letter dated June 17, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15176A539), as supplemented by letters dated August 31, October 22, November 2, and November 6, 2015 (ADAMS Accession Nos. ML15243A363, ML15295A470, ML15321A235, and ML15310A522, respectively), Pacific Gas and Electric (PG&E, the licensee), submitted an LAR to revise the licensing bases to adopt the alternative source term (AST) as allowed by Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.67, "Accident source term," for DCPP, Units 1 and 2.

The NRC staff has determined that a regulatory audit of the DCPP LAR should be conducted in accordance with the Nuclear Reactor Regulation (NRR) Office Instruction LIC-111, "Regulatory Audits," for the NRC staff to gain a better understanding of the licensee's calculations and other aspects of the LAR.

Regulatory Audit Basis

The basis of this audit is PG&E's LAR and NUREG-0800, "Standard Review Plan for the Review of Nuclear Power Plants: LWR Edition" (SRP) Section 15.0.1, "Radiological Consequence Analyses Using Alternative Source Terms."

This audit will provide information necessary to complete the NRC staff's evaluation of the proposed AST LAR for the NRR Reactor Systems Branch.

Regulatory Audit Scope

The scope of this regulatory audit will include supporting calculation documents used in the application.

Information Necessary for the Regulatory Audit

The licensee is requested to have the following documentation available on site for the audit team. The documentation could be provided electronically or by paper copies. If provided

electronically, the licensee is requested to have at least two computers available for the audit team, with a printer attached.

1. WCAP-16638-P, "Diablo Canyon Units 1 and 2 Replacement Steam Generator Program NSSS Licensing Report"
2. WCAP-16685-P, "Diablo Canyon Units 1 and 2  $T_{avg}$  and  $T_{feed}$  Ranges Program NSSS Engineering Report"
3. Supporting Chapter 15 analysis calculations and documentation for the AST amendment
4. Calculations performed to generate the gas gap fraction provided in Attachment 4 to the LAR

Additional information needs identified during the audit will be communicated to the designated point of contact.

The NRC staff also requests the licensee to make personnel who are familiar with the LAR (including site staff and contractors, if appropriate) accessible upon request (either in person or by phone). The personnel should be able to respond to NRC staff questions.

#### Team Assignments / Resource Estimates

<b>Area of Review</b>	<b>Assigned Auditor</b>
Audit Team Lead	Matthew Hardgrove (NRC)
Technical Reviewer	William MacFee (NRC)

#### Logistics

The audit will be conducted at the Westinghouse Office in Rockville, Maryland, from January 12-14, 2016. Entrance and exit briefings will be held at the beginning and end of this audit, respectively. The licensee is requested to provide a room for the use by the audit team.

The audit will start at 8:00 a.m. on Tuesday, January 12, 2016, and conclude on Thursday, January 14, 2016, at the Westinghouse offices in Rockville, Maryland.

Our tentative schedule for the audit is as follows:

#### January 12, 2016

- |            |   |
|------------|---|
| 8:00 a.m.  | Check-in at Westinghouse Office – meet licensee contact(s), setup for entrance meeting. |
| 8:30 a.m.  | Entrance Meeting - introductions, audit activities, goals, and logistics.               |
| 9:00 a.m.  | NRC Team Breakout/Discussion with the licensee.   |
| 12:00 p.m. | Lunch.  |
| 1:00 p.m.  | NRC Team Breakout/Discussion with the licensee.   |

3:30 p.m.            Audit Team Caucus.  
4:00 p.m.            NRC/Licensee Interim Meeting.  
4:30 p.m.            Audit Team Daily Closeout.

January 13, 2016

8:00 a.m.            NRC Team Breakout/ Discussion with the licensee.  
12:00 p.m.           Lunch.  
1:00 p.m.            NRC Team Breakout/Discussion with the licensee.  
3:30 p.m.            Audit Team Caucus.  
4:00 p.m.            NRC/Licensee Interim Meeting.  
4:30 p.m.            Audit Team Daily Closeout.

January 14, 2016

8:00 a.m.            NRC Team Breakout/ Discussion with the licensee.  
12:00 p.m.           Lunch.  
1:00 p.m.            NRC Team Breakout/Discussion with the licensee.  
3:30 p.m.            Audit Team Caucus.  
4:00 p.m.            NRC/Licensee Interim Meeting.  
4:30 p.m.            NRC/Licensee Exit Meeting.

Deliverables

At the conclusion of the audit, the NRC staff will conduct an exit briefing and will provide a summary of audit results in each subject area defined in the audit scope. An audit report/summary will be issued to the licensee within approximately 90 days from the end of the audit. Additionally, the results of the audit will be utilized to focus the scope of any requests for additional information issued in the course of this review.

REGULATORY AUDIT PLAN FOR JANUARY 12-14, 2016, AUDIT AT WESTINGHOUSE  
FACILITY IN ROCKVILLE, MARYLAND, TO SUPPORT REVIEW OF  
BEST ESTIMATE ANALYZER FOR THE CORE OPERATIONS-NUCLEAR POWER  
DISTRIBUTION METHODOLOGY LICENSE AMENDMENT REQUEST  
PACIFIC GAS AND ELECTRIC COMPANY  
DIABLO CANYON POWER PLANT, UNITS 1 AND 2  
DOCKET NOS. 50-275 AND 50-323

Background

By letter dated April 16, 2015 (Agencywide Documents Access and Management System Accession No. ML15107A333), Pacific Gas and Electric Company (PG&E, the licensee) submitted a license amendment request (LAR) for Diablo Canyon Power Plant (DCPP), Units 1 and 2, requesting approval to revise the Best Estimate Analyzer for the Core Operations-Nuclear (BEACON) power distribution monitoring system methodology described in the DCPP Updated Final Safety Analysis Report Section 4.3.2.2, "Power Distribution," to the method described in WCAP-12472-P-A, Addendum 4, "BEACON Core Monitoring and Operation Support System." This LAR also proposes to revise Technical Specification (TS) 5.6.5, "Core Operating Limits Report (COLR)," Section b to replace WCAP-11596-P-A, "Qualification of the PHOENIX-P/ANC Nuclear Design System for Pressurized Water Reactor Cores," with U.S. Nuclear Regulatory Commission (NRC)-approved WCAP-16045-P-A, "Qualification of the Two-Dimensional Transport Code PARAGON," and NRC-approved WCAP-16045-P-A, Addendum 1-A, "Qualification of the NEXUS Nuclear Data Methodology."

The NRC staff has determined that a regulatory audit of the DCPP LAR should be conducted in accordance with the Nuclear Reactor Regulation (NRR) Office Instruction LIC-111, "Regulatory Audits," for the NRC staff to gain a better understanding of the other aspects of the LAR.

Regulatory Audit Basis

The basis of this audit is PG&E's LAR and this audit will provide information necessary to complete the NRC staff's evaluation of the proposed BEACON LAR for the NRR Reactor Systems Branch.

Regulatory Audit Scope

The NRC staff will focus on the following areas during this audit:

- History of changes related to the present LAR topic.

- DCPD's plant-specific information that impacts the Core Power Distribution Monitoring.
- Present Core Monitoring System.
- The BEACON updated thermocouple evaluation methodology documented in Addendum 4 to WCAP-12472-P-A includes example results for two, four-loop Westinghouse reactor plants with differing core exit thermocouple configurations. Please provide a technical description of the DCPD, Units 1 and 2, core exit thermocouple design configuration and justification that the updated thermocouple evaluation process, and the examples provided in WCAP-12472-P-A, Addendum 4, are applicable to DCPD, Units 1 and 2.
- The updated thermocouple evaluation process utilizes thermocouple readings at various power levels during initial startup of each operating cycle, as described in WCAP-12472-P-A, Addendum 4. Please explain how failures of thermocouples are to be treated at DCPD, Units 1 and 2, including detection of thermocouple failures, and the treatment of thermocouple failures in the analysis of thermocouple mixing factors, including resultant mixing factor and mixing factor standard deviation functions.
- Please provide a description of any changes that need to be made to the BEACON core monitoring system software as a result of the proposed updated thermocouple evaluation process, and/or the implementation of the PARAGON and NEXUS core design methodologies. In addition, please describe the software quality control process used to ensure that the installed software performs according to its intended function, including on-site testing and configuration management.
- The applicant states that WCAP-12472-P-A, Addendum 1-A will be replaced with Addendum 4. To ensure no loss of licensing basis information or requirements, the applicant is requested to confirm that all of the information and requirements currently in WCAP-12472-P-A, Addendum 1-A are also in Addendum 4, as applicable.
- WCAP-12472-P-A, Addendum 4 provides two examples (Plant X and Plant Y) of the application of the updated power-dependent thermocouple standard deviation and uncertainty methodology. Tables 1 and 2 in that report provide a comparison of results obtained using the earlier method with the updated method. To ensure that the implementation of the new methodology at DCPD, Units 1 and 2, is correct and the results are consistent with WCAP-12472-P-A, Addendum 4, please provide a similar comparison using DCPD-specific cycle/power dependent data and plant-specific implementation of the methodology.
- Page 11 of the LAR states that "different assembly types were calculated using NEXUS and the K-infinity results from these calculations were compared directly to PARAGON K-infinity results." Please provide a description of the DCPD,

Units 1 and 2, fuel types to be utilized with the revised methodologies (PARAGON and NEXUS) and justification that the DCP, Units 1 and 2, fuel types are bounded by the qualifications presented in WCAP-16045-P-A and WCAP-16045-P-A, Addendum 1-A.

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Additional information needs identified during the audit will be communicated to the designated point of contact.

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Team Assignments / Resource Estimates

<b>Area of Review</b>	<b>Assigned Auditor</b>
Audit Team Lead	Margaret Watford (NRC)
Technical Reviewer	Fred Forsaty (NRC)

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Sincerely,

*/RA/*

Siva P. Lingam, Project Manager  
Plant Licensing Branch IV-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-275 and 50-323

Enclosures:

1. Audit Plan for AST LAR
2. Audit Plan for BEACON LAR

cc w/encls: Distribution via Listserv

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MHardgrove, NRR/DSS/SRXB

WMacFee, NRR/DSS/SRXB

FForsaty, NRR/DSS/SRXB

**ADAMS Accession No.: ML15355A157**

\*by memorandum

OFFICE	NRR/DORL/LPLIV-1/PM	NRR/DORL/LPLIV-1/LA	NRR/DSS/SRXB/BC*
NAME	SLingam	JBurkhardt	CJackson
DATE	12/21/2015	12/21/2015	12/15/2015
OFFICE	NRR/DORL/LPLIV-1/BC	NRR/DORL/LPLIV-1/PM	
NAME	RPascarelli	SLingam	
DATE	12/24/2015	12/24/2015	

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