DiabloCanyonNPEm Resource

From: Green, Kimberly
Sent: Tuesday, June 29, 2010 2:18 PM
To: Grebel, Terence; Soenen, Philippe R
Cc: Ferrer, Nathaniel; DiabloHearingFile Resource
Subject: RAI Set 6 - AMPs
Attachments: ML1016901307.pdf

Terry and Philippe,

Attached is a copy of the RAI letter that is dated June 29, 2010. The official paper copy is being placed in the mail. If you have any questions, please let me know.

Kimberly Green
Safety PM
(301) 415-1627
kimberly.green@nrc.gov

Hearing Identifier: DiabloCanyon_LicenseRenewal_NonPublic
Email Number: 1525

Mail Envelope Properties (Kimberly.Green@nrc.gov20100629141700)

Subject: RAI Set 6 - AMPs
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From: Green, Kimberly

Created By: Kimberly.Green@nrc.gov

Recipients:
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Tracking Status: None
"DiabloHearingFile Resource" <DiabloHearingFile.Resource@nrc.gov>
Tracking Status: None
"Grebel, Terence" <TLG1@pge.com>
Tracking Status: None
"Soenen, Philippe R" <PNS3@pge.com>
Tracking Status: None

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Expiration Date:
Recipients Received:

June 29, 2010

Mr. John Conway
Senior Vice President
Generation and Chief Nuclear Officer
Pacific Gas and Electric Company
77 Beale Street, MC B32
San Francisco, CA 94105

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION RELATED TO THE REVIEW OF THE DIABLO CANYON NUCLEAR POWER PLANT, UNITS 1 AND 2, LICENSE RENEWAL APPLICATION (TAC NOS. ME2896 AND ME2897) – AGING MANAGEMENT PROGRAMS

Dear Mr. Conway:

By letter dated November 23, 2009, Pacific Gas & Electric Company submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54, to renew the operating licenses for Diablo Canyon Nuclear Power Plant, Units 1 and 2, for review by the U.S. Nuclear Regulatory Commission (NRC or the staff). The staff is reviewing the information contained in the license renewal application and has identified, in the enclosure, areas where additional information is needed to complete the review.

The request for additional information was discussed with Mr. Terry Grebel, and a mutually agreeable date for the response is within 30 days from the date of this letter. If you have any questions, please contact me at 301-415-1045 or by e-mail at nathaniel.ferrer@nrc.gov.

Sincerely,

/RA/ K. Green for

Nathaniel Ferrer, Safety Project Manager
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-275 and 50-323

Enclosure:
Request for Additional Information

cc w/encl: See next page

June 29, 2010

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Senior Vice President
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Nathaniel Ferrer, Safety Project Manager
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Docket Nos. 50-275 and 50-323

Enclosure:
Request for Additional Information

cc w/encl: See next page

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ADAMS Accession No.:ML101690130

OFFICE	PM:RPB2:DLR	LA:DLR	BC:RPB2:DLR	PM:RPB2:DLR
NAME	NFerrer	IKing	DWrona	NFerrer (KGreen for)
DATE	6/25/10	6/25/10	6/29/10	6/29/10

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Diablo Canyon Nuclear Power Plant, Units 1 and 2
License Renewal Application
Request for Additional Information Set 6
Aging Management Programs

RAI B2.1.7-1

The Generic Lessons Learned (GALL) aging management program (AMP) XI.M18 "Scope of Program" element states that it "covers bolting within the scope of license renewal, including: 1) safety-related bolting, 2) bolting for nuclear steam supply system (NSSS) component supports, 3) bolting for other pressure retaining components, including nonsafety-related bolting, and 4) structural bolting (actual measured yield strength ≥ 150 ksi)."

The license renewal application (LRA) description of bolting in the applicant's program for both the "program description" and "scope of program," differs from that in GALL AMP XI.M18:

a) The applicant's description includes "ASME component support bolting" and "ASME Class bolting" – terms not included in the GALL Report – and excludes "bolting for NSSS component supports" and "structural bolting" that are included in the GALL Report.

b) It is not clear from the applicant's description and scope of program whether "the bolting for other pressure retaining components," including "nonsafety-related bolting" and the "structural bolting" classifications, are included in the LRA.

Reconcile the differences in description and scope of program elements by clarifying where each of the four classifications of the GALL AMP XI.M18 bolting is described in the LRA. If any changes to the program description are needed, revise the Final Safety Analysis Report (FSAR) Supplement, Section A.1.7 of the LRA accordingly.

RAI B2.1.7-2

The GALL Report program element "parameters monitored or inspected" for AMP XI.M18 states that "bolting for safety-related pressure retaining components is inspected for leakage, loss of material, cracking, and loss of preload/loss of prestress." The applicant, in LRA Appendix B, Section B2.1.7, takes exception to the GALL Report and does not include the inspection for loss of preload/prestress.

The applicant's information in the exception to the GALL Report for "parameters monitored or inspected" in LRA Section B2.1.7 appears to suggest that loss of preload is managed through the control of certain values of the installation torque that are assured procedurally. However, there is no clear statement for this exception as to what is done in lieu of the GALL Report recommended inspection for loss of preload, and what steps are followed to assure proper installation torques and to confirm if the preload is maintained as expected.

ENCLOSURE

Request 1:

Provide a clear statement of (a) what the proposed alternative in the Diablo Canyon Nuclear Power Plant (DCPP) Bolting Integrity program is in lieu of the preload inspections and (b) what steps are taken to assure that proper torques are applied and preloads are maintained.

The applicant appears to include as part of its justification for the exception that EPRI NP-5769, Vol. 2, Section 10 "suggests that inspection of preload is usually unnecessary if the installation method has been carefully followed." The quoted suggestion in the LRA does not appear to be from the Section 10, but is a quotation from a paper referenced in that appendix, which has several limitations including that the scope does not include the safety-related pressure retaining bolting.

Request 2:

Provide a correct reference to the quoted suggestion from EPRI NP-5769, Section 10, cited as support for the exception, and provide relevant justification or a basis for the DCPP alternative to the preload inspections of the safety-related pressure retaining bolting.

RAI B2.1.7-3

The "operating experience" program element of the applicant's AMP summarizes an occurrence of bolting failures in 2001 attributed to unanticipated high temperature embrittlement and elevated stress, due to overtorquing, in the presence of a corrodant. As a result, DCPP identified components with susceptible bolting material and evaluated for replacement based on service temperature, service life, fastener stress intensity, and chemical composition. The operating experience summary also notes that since the 2001 incident, there have been no aging-related bolting failures and no unique plant-specific experience was identified at DCPP.

Based on a review of available information, the staff could not confirm adequacy of the replacement program with regard to the aging management of the 17-4 PH bolting for the period of extended operation. Also, a review of the industry experience summarized by the applicant did not reveal any similar bolting failures under similar application/conditions in other operating plants.

Provide details on how the integrity of any remaining 17-4 PH fasteners described in the LRA is assured through the inspection/replacement plan for the period of extended operation. How does the plan check or confirm that the embrittlement is adequately controlled to provide sufficient margin against any recurrence of this type of bolting failure?

Provide data that supports the DCPP conclusion that no unique plant-specific operating experience was identified. If the type of 2001 bolting failure has not been reported in other plants, then what plant-specific conditions made this a unique experience, and how are these addressed in the long-term aging management of this issue.

RAI B2.1.7-4

The applicant has taken an exception to the GALL Report for the "monitoring and trending" program element of the GALL AMP XI.M18. This relates to the use of DCPP Corrective Action Program (CAP) with detailed evaluation of any non-ASME, pressure-retaining bolting leakage to determine the monitoring frequency, instead of the GALL AMP prescribed frequency.

Provide the technical basis and justification for the CAP based determination of the monitoring frequency. Include in your discussion, an explanation of why the alternative method will be adequate in ensuring proper monitoring frequency during the period of extended operation.

RAI B2.1.7-5

GALL AMP XI.M18, "Bolting Integrity," states that GALL AMP XI.S3, "ASME Section XI Subsection IWF," also manages inspection of safety-related bolting. This includes high strength bolting for which EPRI NP-5769 and EPRI TR-104213 recommend inspections for stress corrosion cracking (SCC) to prevent or mitigate degradation and failure of structural bolting with actual yield strength greater than or equal to 150 ksi.

Provide confirmation that high strength bolting with yield strength greater than or equal to 150 ksi are employed as structural bolting, ASME component and piping supports bolting, NSSS support bolting, safety-related bolting and other pressure-retaining bolting under DCPP AMPs. Provide confirmation that the determination for high strength of structural bolting is based on the actual measured yield strength.

Also, explain how the GALL Report recommendations to prevent or mitigate the degradation and failure of these bolts are implemented in the applicant's program to confirm that the aging effects of high strength bolting are adequately managed so that their intended function will be maintained consistent with the current licensing basis for the period of extended operation, as required by 10 CFR 54.21(a)(3).

RAI B2.1.26-1

GALL Report AMP XI.E3, "Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements," program element 1, "scope of program," provides definitions for significant moisture and significant voltage. Standard Review Plan-License Renewal (SRP-LR) Table 3.6-2, Final Safety Analysis Report (FSAR) Supplement for Aging Management of Electrical and Instrumentation and Control System also includes definitions for significant moisture and significant voltage. In addition, GALL Report AMP XI.E3 states that the specific type of test performed will be determined prior to the initial test, and is to be a proven test for detecting deterioration of the insulation system due to wetting, such as power factor, partial discharge, or polarization index as described in EPRI TR-103834-P1-2.

LRA FSAR Supplement Section A1.26 does not include definitions of significant moisture or significant voltage consistent with SRP- LR Table 3.6-2 or GALL AMP XI.E3. The lack of these definitions in combination with the applicant's stated objective of using inspections to ensure

that cables are infrequently submerged may not provide consistency with GALL AMP XI.E3. Additionally, Section A1.26 does not specify that other testing is to be a proven test for detecting deterioration of the insulation system due to wetting as stated by SRP-LR Table 3.6-2 and GALL AMP XI.E3.

Explain why LRA FSAR Supplement Section A1.26 for LRA AMP B2.1.26 does not include the definitions of significant voltage and significant moisture or specify that other testing is to be a proven test consistent with GALL Report AMP XI.E3 and SRP-LR Table 3.6-2.

RAI B2.1.26-2

GALL AMP XI.E3 states that the program applies to inaccessible medium voltage cables that are exposed to significant moisture simultaneously with significant voltage. Significant moisture is defined as periodic exposures to moisture that lasts for more than a few days. GALL AMP XI.E3 also states that periodic actions are taken to prevent cables from being exposed to significant moisture. GALL AMP XI.E3 further states that inspection for water collection should be performed based on actual plant experience with water accumulation in the manhole with an inspection frequency of at least every two years.

The applicant identified operating experience, and the staff confirmed through operating experience review, cases of in-scope inaccessible medium voltage cables exposed to significant moisture (cable submergence) and cable support structural degradation inconsistent with GALL AMP XI.E3 (i.e., periodic actions are taken to prevent cables from being exposed to significant moisture). Cables submerged for an extended period of time may be degraded and may not be able to perform their intended function for the period of extended operation.

Discuss how LRA AMP B2.1.26, described as consistent with the GALL Report, will be an effective AMP during the period of extended operation based on DCPP operating experience that shows in-scope inaccessible medium voltage cables exposed to significant moisture (i.e., exposure lasting more than a few days). Specifically,

1. Describe how plant operating experience has been or will be assessed and applicable changes incorporated into AMP B2.1.26 to minimize exposure of in-scope inaccessible medium voltage cables and cable splices to significant moisture and minimize cable support structure degradation during the period of extended operation.

2. Discuss manhole/vault inspection procedures for in-scope cable testing and inspection. The discussion should include any periodic and event-driven (such as rain/flood) inspections as applicable to minimize inaccessible medium voltage cable exposure to significant moisture. In the discussion, provide your assessment of cable insulation including splices, and efforts to minimize cable support structure degradation during the period of extended operation. The discussion should also include accommodation for future adjustments/modifications to inspection methods and frequency based on operating experience (industry and plant specific).

3. Describe corrective actions taken or planned to minimize in-scope medium voltage submergence and cable support structure degradation.

4. Discuss inspections and tests performed that demonstrate that in-scope medium voltage cables will continue to perform their intended function during the period of extended operation having previously been exposed to significant moisture (cable submergence).

Letter to J. Conway from N. Ferrer dated June 29, 2010

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Diablo Canyon Nuclear Power Plant,
Units 1 and 2

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