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PG&E Letter DCL-10-101

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20852

Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2
Response to NRC Letter dated July 20, 2010, Request for Additional Information (Set 12) for the Diablo Canyon License Renewal Application

Dear Commissioners and Staff:

By letter dated November 23, 2009, Pacific Gas and Electric Company (PG&E) submitted an application to the U.S. Nuclear Regulatory Commission (NRC) for the renewal of Facility Operating Licenses DPR-80 and DPR-82, for Diablo Canyon Power Plant (DCPP) Units 1 and 2, respectively. The application included the license renewal application (LRA), and Applicant's Environmental Report – Operating License Renewal Stage.

By letter dated July 20, 2010, the NRC staff requested additional information needed to continue their review of the DCPP LRA.

PG&E's response to the request for additional information is included in Enclosure 1. LRA Amendment 10 resulting from the responses is included in Enclosure 2 showing the changed pages with line-in/line-out annotations.

PG&E makes no regulatory commitments (as defined in NEI 99-04) in this letter.

If you have any questions regarding this response, please contact Mr. Terence L. Grebel, License Renewal Project Manager, at (805) 545-4160.

A139
NRR

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

Executed on August 17, 2010.

Sincerely,

James R. Becker
Site Vice President

pns/50330132
Enclosure
cc: Diablo Distribution
cc/enc: Elmo E. Collins, NRC Region IV Regional Administrator
Nathanial Ferrer, NRC Project Manager, License Renewal
Kimberly J. Green, NRC Project Manager, License Renewal
Michael S. Peck, NRC Senior Resident Inspector
Alan B. Wang, NRC Project Manager, Office of Nuclear Reactor Regulation

**PG&E Response to NRC Letter dated July 20, 2010,
Request for Additional Information for the
Diablo Canyon License Renewal Application**

RAI 2.3.2.4-1

License Renewal Application (LRA) Table 3.2.2-04 identifies an aging management review (AMR) line item for a stainless steel separator with an internal ventilation atmosphere. During the material/environment verification audit walkdown, the applicant stated that this piece of equipment was not installed. In LRA Tables 2.3.2-4 and 3.2.2-4, separator is listed as a component type subject to an AMR. However, on license renewal boundary drawing LR-DCPP23A-106723-04, Note 1 indicates that there are provisions for moisture separators but they are not installed. Additionally, there are no moisture separators shown on the drawing as subject to an AMR, i.e., highlighted. Clarify if there are moisture separators installed in the Unit 1 containment fan coolers, and whether they are subject to an AMR.

PG&E Response to RAI 2.3.2.4-1

By letter dated June 18, 2010, PG&E submitted License Renewal Application (LRA), Amendment 1 that revised the screening and aging evaluations to reflect that the moisture separators as shown on LR-DCPP-23A-106723-04 have been removed from the plant. See revised LRA Tables 2.3.2-4 and 3.2.2-4 in Amendment 1.

RAI 2.3.3.18-1

LRA Table 3.3.2-18 identifies an AMR line item for isothermal bath heat exchanger (ITB chiller) with the material and internal environment listed as copper alloy and dried gas, respectively. During the material/environment verification audit walkdown, the applicant stated that this piece of equipment was abandoned in place for both units. The staff noted that the ITB chillers were cut, capped and drained. However, in LRA Tables 2.3.3-18 and 3.3.2-18, and on license renewal boundary drawing LR-DCPP-15-106715-02, the ITB chiller is listed or shown as a component type that is subject to an AMR. Based on the above, clarify if the ITB chiller is subject to an AMR.

PG&E Response to RAI 2.3.3.18-1

By letter dated June 18, 2010, PG&E submitted License Renewal Application (LRA), Amendment 1 that revised the screening and aging evaluations to reflect that the isothermal bath heat exchanger (ITB Chiller) as shown on LR-DCPP-15-106715-02 has been abandoned in place. The piping has been cut and capped as noted by NRC during their walkdown. See revised LRA Tables 2.3.3-18 and 3.2.2-18 in Amendment 1.

RAI 2.1.6-1

LRA Section B.2.1.32 describes the Structures Monitoring Program (SMP) as managing cracking, loss of material, and change in material properties by monitoring the condition of structures and structural supports that are in the scope of license renewal. The applicant states that though coatings may have been applied to the external surfaces of structural members, no credit was taken for these coatings in the determination of aging effects for the underlying materials. The applicant further states that the SMP evaluates the condition of the coatings as an indication of the condition of the underlying materials.

NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," states that "Proper maintenance of protective coatings inside containment is essential to ensure operability of post-accident safety systems that rely on water recycled through the containment sump/drain system." On page B-13 of the LRA, line item XI.S8 states that the NUREG-1801 Protective Coating Monitoring and Maintenance Program is not applicable to Diablo Canyon Nuclear Power Plant (Diablo Canyon).

1. *Please justify why GALL aging management report (AMP) XI.S8 does not apply to Diablo Canyon.*

2. *Since degradation of Service Level 1 protective coatings in containment can potentially become a debris source that challenges the safety function of the emergency core. cooling system, please provide a justification for not including Service Level 1 protective coatings in scope by rule in 10 CFR 54.4(a)(2).*

3. *Provide the details of how Service Level 1 protective coatings in containment will be properly maintained and not become a debris source that might challenge the safety function of the emergency core cooling system, during the period of extended operation.*

PG&E Response to RAI 2.1.6-1

1. PG&E will continue to implement the existing Coating Quality Monitoring Program during the period of extended operation. See new License Renewal Application Sections A1.40 and B2.1.40 in Enclosure 2. PG&E has evaluated its existing program for maintenance of protective coatings inside containment and concludes that this existing program is consistent with NUREG-1801 (AMP XI.S8), Revision 1, since it is a program developed in accordance with Regulatory Guide 1.54, Revision 0, and Generic Letter 98-04.

2. See response to Item 1, above.

3. See response to Item 1, above.

RAI B2.1.13-3

GALL AMP XI.M27, "Fire Water System," recommends periodic flow testing of the fire water system or wall thickness evaluations (e.g., volumetric or visual inspections) be performed to ensure that the system maintains its intended function. GALL AMP XI.M27 states that if an applicant chooses to perform visual inspections, these inspections must be capable of evaluating (1) wall thickness to ensure against catastrophic failure, and (2) the inner diameter of the piping as it applies to the design flow of the fire protection system.

During the AMP Audit, the staff noted that the applicant's underground firewater piping does not have cathodic protection and is currently not periodically inspected. During its review of AMR results for the fire protection system in LRA Table 3.3.2-12, the staff noted that there are AMR results for buried steel (carbon steel, cast iron, and ductile iron) closure bolting, hydrants and valves, but that there are no results for buried steel piping. In addition, LRA Section 82.1.13 does not include any information regarding the inspection of buried components.

It is not clear to the staff why there are no AMR results in LRA Table 3.3.2-12 for buried steel piping or the method and frequency of the inspections for the internal and external surfaces of the buried components.

1. *Explain why there are no AMR results in LRA Table 3.3.2-12 that address aging management of steel piping exposed to soil.*

2. *Provide additional details regarding the method and frequency of the internal and external inspections of underground components.*

PG&E Response to RAI B2.1.13-3

1. License Renewal Application (LRA) Table 3.3.2-12 has been revised to include buried steel piping, buried cast iron piping and buried ductile iron piping. See revised LRA Table 3.3.2-12 in Enclosure 2.

2. Diablo Canyon Power Plant (DCPP) fire water piping inspections will be conducted in accordance with the recommendations outlined in NUREG-1801, XI.M27, Element 4. This states, in part: If the environmental and material conditions that exist on the interior surface of the below grade fire protection piping are similar to the conditions that exist within the above grade fire protection piping, the results of the inspections of the above grade fire protection piping can be extrapolated to evaluate the condition of below grade fire protection piping. If not, additional inspection activities are needed to ensure that the intended function of below grade fire protection piping will be maintained consistent with the current licensing basis for the period of extended operation.

DCPP fire water piping is visually inspected for early indications of aging effects (such as material wastage, pitting, blistering, or porosity) on an 18-month frequency. In addition, the firewater yard loop and underground feeds are flushed semiannually. The flowing water removes accumulated debris and/or sediment, which can be indicative of internal pipe aging. The firewater system is flow tested at least every three years in order to verify firewater system design and National Fire Protection Association (NFPA) test requirements.

These testing frequencies are performed to satisfy DCPP Equipment Control Guidelines (ECGs), which were derived from the DCPP Technical Specifications (TS). Per License Amendments 74 and 75 for Units 1 and 2, respectively, NRC approved DCPP's request to relocate the fire protection TS and associated bases to the ECGs.

NFPA Standard 25, Section 4.6.1.1.1 states: "As an alternative means of compliance, subject to the authority having jurisdiction, components and systems shall be permitted to be inspected, tested and maintained under a performance-based program." Based on quarterly system engineering evaluations of DCPP operating experience and implementation of associated corrective actions, DCPP has not found it necessary to re-evaluate the frequency of firewater piping inspections.

DCPP currently performs opportunistic inspections of buried firewater piping as part of its system walkdown inspections when excavation is occurring. As discussed in LRA Section B2.1.13, for the period of extended operation, DCPP also commits to performing "either periodic, nonintrusive volumetric examinations (e.g., ultrasonic or eddy current) or visual inspections of fire water system piping."

In summary, DCPP conducts several tests and inspections on firewater piping; is in compliance with the licensing basis previously approved by NRC (reference: License Amendment Request 90-11); meets the intent of NFPA 25 for performance-based testing; has committed to align with NUREG-1801, XI.M27, Element 4 for either periodic, nonintrusive volumetric examinations or visual inspections of firewater piping; and, does not have trends that would put the current testing frequency into question.

RAI B2.1.13-4

GALL AMP XI.M27, "Fire Water System" recommends that fire protection system piping be subjected to flow testing or non-intrusive wall thickness evaluations prior to the period of extended operation and at plant-specific intervals thereafter such that loss of intended function will not occur. GALL AMP XI.M27 states that visual inspections may be performed on the internal surfaces of a representative number of piping locations during system maintenance in lieu of performing non-intrusive wall thickness evaluations, as long as it can be demonstrated that the inspections are performed on a representative number of locations on a reasonable basis and are based on past maintenance history.

The applicant's Fire Water System Program states an enhancement to the "detection of aging effects" program element to perform either periodic non-intrusive examinations or visual inspections of the fire water system piping. However, LRA Section B2.1.13 does not provide any details regarding the methodology that will be used for selecting the representative sample of components and locations to be visually inspected or the components subject to periodic nonintrusive examination.

LRA Table 3.3.1, item 3.3.1-68 addresses carbon steel piping, piping components, and piping elements exposed to raw water (either internal or external) being managed for loss of material due to general, pitting, crevice, and microbiologically influenced corrosion, and fouling by the Fire Water System Program. The corresponding AMR line item in LRA Table 3.3.2-12 for the fire water tank cites generic Note D, indicating that the component is different, but consistent with the GALL Report item for material, environment and aging effect. In LRA Appendix B, Section B2.1.13 for the Fire Water System Program under the description of inspections section, PG&E states that the program performs periodic visual inspections of fire system piping, yard loop fire hydrants, hose reel headers, hose stations, portable diesel driven fire pump hoses, fire hoses, gaskets, water spray headers, sprinkler system headers, water spray nozzles, and sprinkler heads to verify they are free of significant corrosion, foreign materials, biofouling, and physical damage. However, the Fire Water System Program description and description of inspections do not include any information regarding whether or how the fire water tank is inspected, e.g., visual or non-intrusive.

1. *Explain the methodology used to determine the representative sample of locations for the visual inspections, and the components subject to periodic non-intrusive examination.*

2. *Clarify how the fire water tank described in LRA Table 3.3.2-12 will be managed for aging by the Fire Water System Program. Include what inspection techniques are used to manage the effects of aging for the tank.*

PG&E Response to RAI B2.1.13-4

The methodology used to determine the representative sample of locations for visual inspections is based on opportunistic inspections of accessible exposed portions of the firewater system. This includes routine preventive maintenance inspection and test activities, and corrective maintenance work involving system breach. For example, maintenance plans currently inspect and/or test boundary check valves, flow switches, and strainers at various system locations in the system on a routine basis. Corrective maintenance to replace process line valves or pipe sections affords additional inspection opportunities at other more or less random locations. This strategy is considered representative and an effective means of performing internal system inspections, complementing other monitoring and trending techniques to effectively assess overall firewater system performance

The Fire Water System Aging Management Program will be used to manage aging of the fire water tank. The interior and exterior of the fire water storage tank are routinely inspected. The exterior pyrocrete tank structure is inspected by Civil Engineering. Tank internals are inspected and cleaned (if required) by Maintenance and Engineering employing divers and/or video. The current task interval is five years as determined by the living Preventative Maintenance Program. Examination and inspection results are documented and retained.

LRA Amendment 10

LRA Section	RAI
A1.40	2.1.6-1
B2	2.1.6-1
B2.1.40	2.1.6-1
Table 3.3.2-12	B2.1.13-3

A1.40 PROTECTIVE COATING MONITORING AND MAINTENANCE PROGRAM

The Protective Coating Monitoring and Maintenance program is an existing program that manages the condition of Service Level I coatings, including cracking, blistering, flaking, peeling, and delamination subjected to indoor air in the containment structure. The Diablo Canyon Protective Coating Monitoring and Maintenance Program monitors the conditions of the Service Level I coatings during refueling outages and uses the corrective action program to resolve nonconforming coatings and those experiencing degradation.

The Protective Coating Monitoring and Maintenance Program, establishes qualifications for individuals responsible for inspecting, coordinating, and evaluating the conditions of the coatings. The Protective Coating Monitoring and Maintenance Program requires that all accessible areas of containment are planned for inspections. During every refueling outage, a walkdown is performed by qualified individuals knowledgeable in nuclear coatings to conduct visual examinations and perform physical testing as necessary on the coatings to monitor their condition over time.

The Protective Coating Monitoring and Maintenance Program is a condition monitoring program and the monitoring methods are effective in detecting the applicable aging effects and the frequency of monitoring is adequate to prevent significant degradation.

B2 AGING MANAGEMENT PROGRAMS

The correlation between NUREG-1801, Generic Aging Lessons Learned programs and DCPP programs is shown below. For DCPP programs, links to appropriate sections of this appendix are provided.

NUREG-1801 NUMBER	NUREG-1801 PROGRAM	PLANT PROGRAM	EXISTING OR NEW	APPENDIX B REFERENCE
XI.S8	Protective Coating Monitoring and Maintenance Program	Protective Coating Monitoring and Maintenance Program	New	B2.1.40

B2.1.40 Protective Coating Monitoring and Maintenance Program

Program Description

The Protective Coating Monitoring and Maintenance Program is an existing program that manages the condition of Service Level I coatings, including cracking, blistering, flaking, peeling, and delamination subjected to indoor air in the containment structure. Although Diablo Canyon is not committed to Regulatory Guide (RG) 1.54, Revision 0, the NRC reviewed the Diablo Canyon Coating Program in Supplemental Safety Evaluation Report (SSER) 26 and concluded that it is comparable with RG 1.54, Revision 0. PG&E Letter DCL-98-159, dated November 12, 1998, responded to NRC Generic Letter (GL) 98-04 and provided a description of the Diablo Canyon Coatings Monitoring and Maintenance Program used to maintain protective coatings inside containment. NUREG 1801, Item XI.S8 notes that a program developed in accordance with RG 1.54, Revision 0, and Generic Letter 98-04 is acceptable as an aging management program for license renewal.

The Diablo Canyon Protective Coating Monitoring and Maintenance Program monitors the conditions of the Service Level I coatings during refueling outages and uses the Corrective Action Program to resolve nonconforming coatings and those experiencing degradation.

The Protective Coating Monitoring and Maintenance Program, establishes qualifications for individuals responsible for inspecting, coordinating, and evaluating the conditions of the coatings. The program identifies instruments and equipment to be used for inspections.

The Protective Coating Monitoring and Maintenance Program requires that all accessible areas of containment are planned for inspections. During every refueling outage, a walkdown is performed by qualified individuals knowledgeable in nuclear coatings to conduct visual examinations and perform physical testing as necessary on the coatings to monitor their condition over time.

The Protective Coating Monitoring and Maintenance Program requires that an initial walk-through is conducted, followed by more thorough inspections on previously designated areas, and in areas noted during the initial walk-through as being deficient and requiring repair.

Guidance is provided in the program for the characterization of defects including blistering, cracking, flaking, peeling, delamination, and rusting. When appropriate, additional testing (e.g., adhesion and dry film thickness) may be specified in order to characterize the severity of observed deficiencies. The coatings evaluator dispositions

all coating deficiencies in accordance with the program in the written inspection report that describes the size and number of visible defects, their locations, and a disposition as whether to repair the defects in the current outage, or to continue to monitor the defects.

The Protective Coating Monitoring and Maintenance Program is a condition monitoring program and the monitoring methods are effective in detecting the applicable aging effects and the frequency of monitoring is adequate to prevent significant degradation.

NUREG-1801 Consistency

The Protective Coating Monitoring and Maintenance Program is consistent with the recommendations of XI.S8, "Protective Coating Monitoring and Maintenance Program," specified in NUREG-1801.

Exceptions to NUREG-1801

None

Enhancements

None

Operating Experience

The most recent inspections of coatings inside Units 1 and 2 containments were performed during the fifteenth refueling outages, 1R15 and 2R15 (February 2009 and October 2009) by a Level III qualified coatings inspector in accordance with Diablo Canyon Power Plant Modification Installation Procedure MIP-CT-2.0, "Coating Quality Monitoring Program (DCP-210)." Coating deficiencies identified on any structure or equipment during 1R15 and 2R15 have been documented in DCPP's Corrective Action Program (CAP).

<u>Coating Condition Summary for Units 1 and 2 Containments</u>

The following summarizes the evaluations conducted by the Applied Technology Services Coatings Engineer/Level III Coatings Inspector on the findings reported by the coatings monitoring personnel:

The plant health code for safety-related coatings for both units was Green. The majority of coatings inside the Unit 1 and Unit 2 containments are in good condition. As a result of the Steam Generator Replacement Project (SGRP), 912.5 sq ft of unqualified coatings were removed from inside the Unit 1 containment. Less than 0.1 percent of

the areas of liner plate coating deficiencies were identified from containment liner coatings walkdowns for both units. Normal mode of deficiencies was mechanical damage averaging ¼ inch to ½ inch diameter in size. This was based on the form of the damage and activities performed in the areas where the damage located. The defect areas were cleaned and coated prior to the end of 1R15 and 2R15, respectively. A total of 3 sq ft cluster of liner plate coatings was found cracked and delaminated at 185 ft and 195 ft elevations in Unit 1. The loose coatings were removed without repair. Two square feet of the three square foot area were left as bare steel after cleaning. This area will require continuous monitoring. Coatings on component cooling water (CCW) piping lines behind containment fan cooling units (CFCU's) were found to show cracks and delaminations. The defected areas were repaired prior to the end of 1R15 and 2R15. Approximately 56 sq ft of coatings on the exterior of CCW pipes were identified to be deficient in 1R15 without treatment and repair. It was counted as unqualified coatings.

1R15 and 2R15 Inspection Findings

General walk-through and specific visual inspections of coated structures and equipment inside the containment were conducted by qualified coatings inspectors. All coated surfaces of steel and concrete were closely examined from accessible 91 ft, 115 ft, and 140 ft elevations for visible defects such as blistering, cracking, rusting, peeling or delamination. Any identified visual defect in the coating was documented for each coated item. Notifications were initiated for further evaluation of these defective areas. Any defective coating with potential to fail and generate debris was either removed or reported as unqualified to be included in the 'unqualified coatings log.' Coating repair was recommended where necessary and prioritized.

Conclusion

The existing Protective Coating Monitoring and Maintenance Program provides reasonable assurance that the aging effects of the Service Level I coatings inside containment, including cracking, blistering, flaking, peeling, and delamination are adequately managed so that the intended functions of components within the scope of license renewal will be maintained consistent with the current licensing basis during the period of extended operation.

Table 3.3.2-12 Auxiliary Systems – Summary of Aging Management Evaluation – Fire Protection System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	PB	Asbestos Cement	Raw Water (Int)	Loss of material, cracking and changes in material properties	Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)	None	None	F
Piping	LBS, PB	Carbon Steel	Atmosphere/ Weather (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-9	3.3.1.58	B
Piping	PB	Carbon Steel	Buried (Ext)	Loss of material	Buried Piping and Tanks Inspection (B2.1.18)	VII.G-25	3.3.1.19	B
Piping	LBS, PB	Carbon Steel	Dry Gas (Int)	None	None	VII.J-23	3.3.1.97	A
Piping	LBS, PB	Carbon Steel	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Piping	LBS, PB	Carbon Steel	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B
Piping	PB	Carbon Steel (Galvanized)	Plant Indoor Air (Ext)	Loss of material	External Surfaces Monitoring Program (B2.1.20)	VII.I-8	3.3.1.58	B
Piping	PB	Carbon Steel (Galvanized)	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B
Piping	PB	Cast Iron	Buried (Ext)	Loss of material	Buried Piping and Tanks Inspection (B2.1.18)	VII.G-25	3.3.1.19	B
Piping	PB	Cast Iron	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B
Piping	PB	Ductile Iron	Buried (Ext)	Loss of material	Buried Piping and Tanks Inspection (B2.1.18)	VII.G-25	3.3.1.19	B
Piping	PB	Ductile Iron	Raw Water (Int)	Loss of material	Fire Water System (B2.1.13)	VII.G-24	3.3.1.68	B