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PG&E Letter DCL-10-097

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 19, 2010, Request for Additional Information (Set 9) 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 19, 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 8, resulting from the responses, is included in Enclosure 2 showing the changed pages with line-in/line-out annotations.

PG&E makes the following commitment in LRA Table A4-1, "License Renewal Commitments": PG&E will revise plant procedures to specify visual inspections for corrosion of structural members of the containment dome service crane and special service hoists, jib cranes, and monorails.

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

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NRR

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

Executed on August 2, 2010.

Sincerely,

James R. Becker
Site Vice President

pns/50329611
Enclosures
cc: Diablo Distribution
cc/enc: Elmo E. Collins, NRC Region IV Regional Administrator
Nathanial B. 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

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RAI B2.1.11-1

The "detection of aging effects' program element of Generic Aging Lessons Learned (GALL) aging management program (AMP) XI.M23, "Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems:' states that crane rails and structural components are visually inspected on a routine basis for degradation. In license renewal application (LRA) Section B2.1.11, the applicant states that its Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems Program is consistent with GALL AMP XI.M23.

During the audit, the staff reviewed the implementing procedures for the applicanfs Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems Program. The staff found that the implementing procedures specify periodic visual inspections for the containment dome service crane and special service hoists, jib cranes, and monorails, but these procedures do not include specific provisions to detect corrosion of structural members.

Indicate whether these procedures will be enhanced to specify visual inspections for corrosion of structural members of the containment dome service crane and special service hoists, jib cranes, and monorails, or justify how the effects of aging on these components will be adequately managed during the period of extended operation..

PG&E Response to RAI B2.1.11-1

PG&E will revise plant procedures to specify visual inspections for corrosion of structural members of the containment dome service crane and special service hoists, jib cranes, and monorails. See revised License Renewal Application Table A4-1, "License Renewal Commitments," in Enclosure 2.

RAI B2.1.18-1

The "detection of aging effects" program element of the Buried Piping and Tanks Inspection Aging Management Program in the GALL Report states that "[a]ny credited inspection should be performed in areas with the highest likelihood of corrosion problems, and in areas with a history of corrosion problems."

The Diablo Canyon technical basis documentation "preventative actions" program element states that stainless steel and asbestos cement buried piping is not wrapped or coated. In addition, during the audit it was determined that a carbon steel valve managed by the Buried Piping and Tanks Inspection Aging Management Program is not coated. Because of the close proximity of the site to the Pacific Ocean, there may be a higher likelihood of buried piping coming into contact with chlorides, which are known to cause localized corrosion in stainless steel and steel material.

Provide additional information about how the uncoated/wrapped stainless steel and asbestos cement buried piping will be considered in the development of plans to conduct planned inspections prior to and within the period of extended operation.

PG&E Response to RAI B2.1.18-1

License Renewal Application, Section B2.1.18, "Buried Piping and Tanks Inspection" (GALL AMP MXI.34), indicated the following: The Diablo Canyon Power Plant (DCPP) Buried Piping and Tanks Inspection Program is a new program that will be implemented prior to the period of extended operation. Within the 10-year period prior to entering the period of extended operation, an opportunistic or planned inspection will be performed. Upon entering the period of extended operation the DCPP Buried Piping and Tanks Inspection Program will require a planned inspection within 10 years unless an opportunistic inspection has occurred within this 10-year period. DCPP procedures will implement the DCPP Buried Piping and Tanks Inspection Program. Under the DCPP Buried Piping and Tanks Inspection Program, buried piping and tanks will be inspected opportunistically as they are excavated or on a planned basis if opportunistic inspections are not available. Any inspection that indicates a potential degraded condition will result in the initiation of corrective actions for further engineering evaluation of the condition of any coating, wrapping, and component surface condition in accordance with the DCPP Corrective Action Program. The engineering evaluation may specify additional inspection techniques to evaluate the degree and extent of degradation. The DCPP Buried Piping and Tanks Inspection Program requires consideration of the results of previous inspections, and those sections of piping with a prior history of aging related issues, so that areas susceptible to age-related degradation will be properly identified for attention during future inspections.

PG&E is committed to follow EPRI 1016456, "Recommendations for an Effective Program to Control the Degradation of Buried Pipe." The EPRI initiative will set an inspection schedule for buried piping segments based on, among other things, pipe materials and locations. The development of inspection plans will consider the materials and environmental conditions for the uncoated/wrapped stainless steel and asbestos cement buried piping and the susceptibility for localized corrosion and other applicable aging effects according to guidelines of EPRI 1016456.

RAI B2.1.20-1

LRA Table 3.3.2-5 includes valves exposed to atmosphere/weather (external) and managed by the AMP B2.1.20, "External Surfaces Monitoring." The GALL AMP XI.M36, "External Surfaces Monitoring;" recommends visual inspection of external surfaces for evidence of material loss and leakage.

During an examination of Diablo Canyon Power Plant (DCPP) plant documentation for External Surfaces Monitoring Programs there were instances of in-scope valves within LRA Table 3.3.2-5 (identification numbers MU-0-267, MU-0-268, MU-0-273, MU-0-883 and MU-0-884 within the make water system) that were buried and therefore not accessible for the visual inspection methods recommended in GALL AMP XI.M36, "External Surfaces Monitoring." The DCPP LRA states that the External Surfaces Monitoring Program relies on visual inspection to detect degradation by aging. It is unclear to the staff that the in-scope buried valves can be monitored by visual inspection. In addition, it is not clear to the staff that buried valves are properly managed by AMP B2.1.20, "External Surfaces Monitoring," because they are exposed to soil environments and not external air.

Provide clarification regarding the correct categorization of the environments to which the in-scope valves are subjected to (external air or soil environments). Provide information confirming that the AMP B2.1.20, "External Surfaces Monitoring," with the requirement for visual inspection, is appropriate to manage aging of these inaccessible buried in-scope components.

PG&E Response to RAI B2.1.20-1

The copper alloy valves, MU-0-267, MU-0-268, MU-0-273, MU-0-883, and MU-0-884, will be managed by the GALL Aging Management Program (AMP), XI.M34, Buried Piping and Tanks Inspection. License Renewal Application (LRA) Table 3.3.2-5, "Auxiliary Systems – Summary of Aging Management Evaluation – Makeup Water System," has been revised to change the environment for the valves to "Buried (Ext)" and the AMP to "Buried Piping and Tanks Inspection (B2.1.18)." LRA Sections A1.18 and B2.1.18 have been revised to include copper alloy as a material managed by the GALL AMP XI.M34. See the revised LRA Table 3.3.2-5 and LRA Sections A1.18 and B2.1.18 in Enclosure 2.

RAI B.3.1-1

The GALL Report AMP X.M1, Metal Fatigue of Reactor Coolant Pressure Boundary, element 4 (detection of aging effects) recommends that the program provides for periodic update of the fatigue usage calculations.

LRA Section B3.1 states that prior to the period of extended operation Enhancement 4 will be implemented in the "detection of aging" program element Enhancement 4 states:

> *The procedures governing the DCPP Metal Fatigue of Reactor Coolant Pressure Boundary program will be enhanced to specify the frequency of periodic reviews of the results of the monitored cycle count and cumulative usage factor data at least once per fuel cycle. This review will compare the results against the corrective action limits to determine any approach to action limits and any necessary revisions to the fatigue analyses will be included in the corrective actions.*

It is not clear to the staff how the frequencies will be established for the periodic reviews of the monitored cycle count and cumulative usage factor data.

Clarify how the frequency of the periodic reviews for the monitored cycle count and cumulative usage factor data are established and will adequately manage fatigue during the period of extended operation.

PG&E Response to RAI B3.1-1

The technical basis for selecting a frequency of at least once per fuel cycle for periodic reviews of the enhanced Metal Fatigue of Reactor Coolant Pressure Boundary Aging Management Program is to align the technical review period with a primary fatigue contribution period. For many locations, the vast majority of component fatigue usage occurs from thermal transients within the plant heatup and cooldown evolution. These heatup and cooldown thermal transient cycles are contained within a refueling period. Additionally, the rates of accumulation of past fatigue usage for other critical locations has been sufficiently low such that projections to the next refueling period are not reasonably expected to exceed action limits. This once-per-refueling period frequency is consistent with industry practice.

LRA Amendment 8

LRA Section	RAI
A4-1	B2.1.11-1
Table 3.3.2-5	B2.1.20-1
A1.18	B2.1.20-1
B2.1.18	B2.1.20-1

Table A4-1 License Renewal Commitments

Item #	Commitment	LRA Section	Implementation Schedule
36	PG&E will revise plant procedures to specify visual inspections for corrosion of structural members of the containment dome service crane and special service hoists, jib cranes, and monorails.	B2.1.11	Prior to the period of extended operation

Table 3.3.2-5 Auxiliary Systems – Summary of Aging Management Evaluation – Makeup Water System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Valve	PB	Copper Alloy	Buried (Ext)	Loss of Material	Buried Piping and Tanks Inspection (B2.1.18)	None	None	G

A1.18 Buried Piping and Tanks Inspection

The Buried Piping and Tanks Inspection program manages cracking, loss of material, and change in surface conditions of buried components in the auxiliary saltwater system, diesel generator fuel transfer system, fire protection system, and the makeup water system. Visual inspections monitor the condition of protective coatings and wrappings found on steel components and directly assess the surface condition of stainless steel, copper alloy, and asbestos cement components with no protective coatings or wraps. Evidence of damaged wrapping or coating defects is an indicator of possible age-related degradation to the external surface of the components. The presence of discolorations, discontinuities in surface texture, cracking, crazing or loss of material of unwrapped stainless steel and asbestos cement components is an indicator of possible corrosion damage to the external surface of the components. The program includes opportunistic inspection of buried piping and tanks as they are excavated or on a planned basis if opportunistic inspections have not occurred.

The Buried Piping and Tanks Inspection program is a new program that will be implemented prior to the period of extended of operation. Within the 10-year period prior to entering the period of extended operation, opportunistic or planned inspections will be performed. Upon entering the period of extended operation planned inspections within 10 years will be required unless opportunistic inspections have occurred within this 10-year period.

B2.1.18 Buried Piping and Tanks Inspection

Program Description

The Buried Piping and Tanks Inspection program manages cracking, loss of material, and change in surface conditions of buried components in the auxiliary saltwater system, diesel generator fuel transfer system, fire protection system, and the makeup water system. Visual inspections monitor the condition of protective coatings and wrappings found on steel components and directly assess the surface condition of copper alloy, stainless steel and asbestos cement components with no protective coatings or wraps. Evidence of damaged wrapping or coating defects is an indicator of possible age-related degradation to the external surface of the components. The presence of discolorations, discontinuities in surface texture, cracking, crazing or loss of material of unwrapped stainless steel, copper alloy, and asbestos cement components is an indicator of possible corrosion damage to the external surface of the components. Any inspection that indicates a potential degraded condition will result in the initiation of corrective actions for further engineering evaluation of the condition of any coating, wrapping and component surface condition in accordance with the DCPP Corrective Action Program. The engineering evaluation may specify additional inspection techniques to evaluate the degree and extent of degradation. The Buried Piping and Tanks Inspection program requires consideration of the results of previous inspections and those sections of piping with a prior history of aging related issues so that areas susceptible to age-related degradation will be properly identified for attention during future inspections. In addition, selective leaching, which is an applicable aging effect for buried gray cast iron components, is managed by the Selective Leaching of Materials program (B2.1.17).

The Buried Piping and Tanks Inspection program is a new program that will be implemented prior to the period of extended operation. Within the 10-year period prior to entering the period of extended operation, an opportunistic or planned inspection will be performed. Upon entering the period of extended operation the DCPP Buried Piping and Tanks Inspection program will require a planned inspection within 10 years unless an opportunistic inspection has occurred within this 10-year period.

DCPP procedures will implement the DCPP Buried Piping and Tanks Inspection program. Under the DCPP Buried Piping and Tanks Inspection program, buried piping and tanks will be inspected opportunistically as they are excavated or on a planned basis if opportunistic inspections are not available.

NUREG-1801 Consistency

The Buried Piping and Tanks Inspection program is a new program that, when implemented, will be consistent with exception to NUREG-1801, Section XI.M34 Buried Piping and Tanks Inspection.

Exceptions to NUREG-1801

Program Elements Affected

Scope of Program - Element 1 and Parameters Monitored/Inspected - Element 3

NUREG-1801, Section XI.M34 program scope provides for management of buried steel piping and components. However, DCPP includes copper alloy, buried stainless, steel and asbestos cement piping in the scope of this aging management program because such components are physically present in the plant. This program uses visual inspection of external surfaces which is an effective aging management method.

Scope of Program - Element 1, Preventive Actions - Element 2, Parameters Monitored/Inspected - Element 3, Detection of Aging Effects - Element 4 and Acceptance Criteria - Element 6

NUREG-1801, Section XI.M34 program addresses coatings and wrappings on buried pipe and tanks. Buried piping that is not coated or wrapped will be visually inspected. Visual inspections on copper alloy and stainless steel piping that is not coated or wrapped will be performed to detect loss of material due to general, pitting, crevice, and microbiologically influenced corrosion. Also, visual inspections of buried asbestos cement piping that is not coated or wrapped will be performed to detect evidence of cracking, loss of material and material changes in surface condition. Visual inspection has proven to be an effective technique to identify cracking, loss of material and changes in surface conditions. Indications of changes in surface conditions include discoloration and visible changes in surface texture.

Enhancements

None

Operating Experience

The DCPP Buried Piping and Tanks Inspection program is a new program; therefore, plant-specific operating experience to verify the effectiveness of the program is not available. Industry operating experience that forms the basis for this program is included in the operating experience element of the corresponding NUREG-1801, Section XI.M34. The DCPP operating experience findings for this program identified no unique plant specific operating experience; therefore DCPP operating experience is consistent with NUREG-1801.

The original diesel fuel oil storage and transfer system (DFO) piping was replaced in 1993 and 1994 due to external corrosion. Inadequate application of a protective coal tar external coating and inadequate trench drainage were cited as the root causes. The piping was replaced with externally coated seamless carbon steel pipe. The majority of the new pipe was installed in a covered concrete pipeway (trench). Due to this method

of construction, no portion of the new DFO transfer system piping is in contact with the soil, and is as such no longer subject to degradation methods associated with a soil environment. The DFO tanks were replaced in 1996 and 1997 to meet California State environmental regulations requiring at least double wall tanks. The new tanks are triple layered and incorporate an engineered fiberglass coating instead of traditional wrappings. The fuel oil tanks and associated piping are equipped with a leak detection system.

In April 1997 and January 1998, for Unit 1 and 2 respectively, a portion of the auxiliary saltwater (ASW) supply piping near the intake structure was replaced. The new ASW piping is routed such that it is supported by the soil and is generally buried at a shallower depth than the original piping. The replacement piping has an internal/external coating system that provides corrosion protection. The replacement piping also has a cathodic protection system that provides a back-up means against corrosion.

Periodic assessments of the effectiveness of the Maintenance Rule as it relate to the buried piping and tanks are performed per plant procedures. Available data on industry operating experience with regard to degradation of the buried piping and tanks are reviewed. The results of periodic assessments and industry experience reviews indicate that the DCPP buried piping and tanks are capable of performing their intended functions. Plant procedures have confirmed that the buried piping and tanks are capable of performing their intended functions.

DCPP Buried Piping and Tanks Inspection program will be effective at managing aging effects of passive components included in its scope through the period of extended operation. Identification of previous weaknesses, and subsequent corrective actions, in conjunction with recent assessments where no issues or findings were noted, provides reasonable assurance that the program will remain effective for managing aging effects in buried piping and tanks.

As additional industry and applicable plant-specific operating experience become available, the operating experience will be evaluated and incorporated into the program through the DCPP Corrective Action Program and Operating Experience Program. This ongoing review of operating experience will continue throughout the period of extended operation, and the results will be maintained on site. This process will confirm the effectiveness of this new program by incorporating applicable operating experience and performing self-assessments of the program.

Conclusion

The implementation of the Buried Piping and Tanks Inspection Program will provide reasonable assurance that aging effects will be managed such that the systems and components within the scope of this program will continue to perform their intended functions within the current licensing basis for the period of extended operation.