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PG&E Letter DCL-15-027

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

Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2
Update to the Diablo Canyon Power Plant License Renewal Application (LRA), Amendment 49 and LRA Appendix E, "Applicant's Environmental Report – Operating License Renewal Stage," Amendment 2

Dear Commissioners and Staff:

By Pacific Gas and Electric Company (PG&E) Letter DCL-09-079, "License Renewal Application," dated November 23, 2009, 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 LRA and LRA Appendix E, "Applicant's Environmental Report – Operating License Renewal Stage."

By PG&E Letter DCL-14-103, "10 CFR 54.21(b) Annual Update to the Diablo Canyon Power Plant License Renewal Application (LRA), Amendment 48 and LRA Appendix E, Applicant's Environmental Report – Operating License Renewal Stage, Amendment 1," dated December 22, 2014, PG&E provided the Staff with its evaluation of draft LR-ISG-2013-01, "Aging Management of Loss of Coating Integrity for Internal Service Level III (Augmented) Coatings" and related LRA mark-ups.

As committed to in PG&E Letter DCL-14-103, Enclosure 1 of this letter provides PG&E's updated evaluation of the final LR-ISG-2013-01, "Aging Management of Loss of Coating or Lining Integrity for Internal Coatings/Linings on In-Scope Piping, Piping Components, Heat Exchangers and Tanks." Enclosure 1 completely supersedes the PG&E evaluation portion of draft LR-ISG-2013-01 that was provided in PG&E Letter DCL-14-103, Enclosure 1, Attachment 8. Enclosure 1 of this letter also provides all LRA sections applicable to the final LR-ISG-2013-01. LRA sections with mark-ups show changes made as a result of PG&E's updated evaluation.

As committed to in PG&E Letter DCL-14-103, Enclosure 2 to this letter provides updates to LRA Appendix E, Chapter 7, "Alternatives to the Proposed Action," Chapter 8, "Comparison of Environmental Impacts of License Renewal With the Alternatives," Section 9.2, "Alternatives," and Attachment F, "Severe Accident Mitigation Alternatives" (SAMA). Currently, an update of the DCPP seismic hazard is scheduled to be submitted to the NRC in March 2015 in response to NRC letter dated March 12, 2012, regarding 10 CFR 50.54(f) request for information pursuant to the post-Fukushima Near-Term Task Force Recommendation 2.1 seismic hazards reevaluation. PG&E is currently scheduled to complete an evaluation of the 2015 seismic hazard results on the SAMA analysis by June 2015.

Enclosure 3 to this letter provides corrections to identified errata in the LRA. The affected LRA pages contain changes shown as electronic markups (deletions crossed out and insertions italicized).

Enclosure 4 to this letter provides corrections to identified errata in the Environmental Report. The affected Environmental Report pages contain changes shown as electronic markups (deletions crossed out and insertions italicized).

PG&E is in the process of addressing Coastal Consistency Certification comments on the original Coastal Consistency Certification (Environmental Report, Attachment E). A schedule for potential coastal consistency review will be established upon determining whether to proceed with license renewal. PG&E will inform the NRC when the schedule has been established.

PG&E makes new regulatory commitments and changes to existing commitments (as defined by NEI 99-04) in this letter. Revised commitments are contained in Enclosure 1 in the LRA Table A4-1 markup. A new regulatory commitment is provided in Enclosure 5.

If you have any questions regarding this response, please contact Mr. Terence L. Grebel, License Renewal Project Manager, at (805) 458-0534.

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

Executed on February 25, 2015.

Sincerely,

Barry S. Allen
Vice President Nuclear Services

gwh/50638280
Enclosures
cc: Diablo Distribution
cc/enc: Marc L. Dapas, NRC Region IV Administrator
Thomas R. Hipschman, NRC, Senior Resident Inspector
Elaine M. Keegan, NRC/NRR
Siva P. Lingam, NRC Project Manager
Richard A. Plasse, NRC Project Manager, License Renewal

Diablo Canyon Power Plant LRA Changes
Reflected in the LRA Update Amendment 49

LRA Section	Subject
Section 2.1.5.15 Table 2.1-2 Section 3.1.2.1.2 Table 3.1.2-2 Section 3.3.2.1.3 Section 3.3.2.1.4 Section 3.3.2.1.5 Section 3.3.2.1.8 Section 3.3.2.1.12 Section 3.3.2.1.13 Section 3.3.2.1.17 Section 3.3.2.1.19 Table 3.3.2-3 Table 3.3.2-4 Table 3.3.2-5 Table 3.3.2-8 Table 3.3.2-12 Table 3.3.2-13 Table 3.3.2-17 Table 3.3.2-19 Section 3.4.2.1.1 Section 3.4.2.1.4 Table 3.4.2-1 Table 3.4.2-4 Section A1.9 Section A1.10 Section A1.13 Section A1.22 Section A1.40 Section A1.42 Table A4-1 (3, 9, & 74) Section B1.5 Section B2 Section B2.1.42	LR-ISG-2013-01, "Aging Management of Loss of Coating Integrity for Internal Coatings/Linings on In-Scope Piping, Piping Components, Heat Exchangers, and Tanks"

LR-ISG-2013-01, Aging Management of Loss of Coating or Lining Integrity for Internal Coatings/Linings on In-Scope Piping, Piping Components, Heat Exchangers, and Tanks

In Pacific Gas and Electric Company (PG&E) Letter DCL-14-103, "10 CFR 54.21(b) Annual Update to the Diablo Canyon Power Plant License Renewal Application (LRA), Amendment 48 and LRA Appendix E, Applicant's Environmental Report – Operating License Renewal Stage, Amendment 1," dated December 22, 2014, PG&E provided a response to draft LR-ISG-2013-01 and committed to providing a response to the final LR-ISG-2013-01, issued on November 14, 2014, to Nuclear Regulatory Commission by February 2015. This enclosure provides PG&E's updated evaluation of the final LR-ISG-2013-01, which completely supersedes the PG&E evaluation portion of Draft LR-ISG-2013-01 that was provided in PG&E Letter DCL-14-103, Enclosure 1, Attachment 8. This enclosure also provides all applicable LRA sections related to the final LR-ISG-2013-01. LRA sections with mark-ups show changes made as a result of PG&E's updated evaluation. LRA sections without mark-ups remain unchanged from what was submitted in PG&E Letter DCL-14-103, Enclosure 1, Attachment 8.

PG&E performed a review to identify the components with internal coatings that are within the scope of license renewal and the final LR-ISG-2013-01.

Based on this review, the in-scope components with internal coatings include:

(1) Condensate polisher demineralizer
(2) Component cooling water (CCW) system heat exchanger waterboxes
(3) CCW butterfly valves
(4) Makeup water system asbestos concrete piping (ACP)
(5) Condensate storage tank
(6) Raw water storage reservoir
(7) Transfer tank
(8) Auxiliary salt water system piping and pipe components
(9) Fire water system ACP
(10) Fire water storage tank
(11) Fire water system sprinkler piping with galvanized coating
(12) Demineralizer regenerant receiver tanks (DRRT)
(13) DRRT piping
(14) Hot laundry and shower drain tanks
(15) Diesel fuel oil storage tank manway
(16) Centrifugal charging pump gear oil cooler shell
(17) Steam generator blowdown demineralizer regeneration system piping and pipe components
(18) Pressurizer relief tank
(19) Oily water and turbine sump system piping and piping components

The aging effects associated with the fire water storage tank internal coatings (item 10) are managed by the Fire Water System program as described in PG&E's evaluation of LR-ISG-2012-02 in PG&E Letter DCL-14-103, Enclosure 1, Attachment 7C. The Fire Water System program will be enhanced to include the relevant recommendations associated with training and qualification of personnel, acceptance criteria, and corrective actions from LR-ISG-2013-01, Appendix C. LRA Section A1.13, "Fire Water System," is revised as shown later in this Enclosure, to incorporate the recommendations associated with training and qualification of personnel, acceptance criteria, and corrective actions from LR-ISG-2013-01, Appendix A, Table 3.0-1.

For the remaining piping, piping components, heat exchangers, and tanks with internal coatings in the scope of license renewal a new aging management program (AMP) was developed to manage aging of these coatings consistent with LR-ISG-2013-01. The new program will include the following elements for the management of internal coatings:

Scope of Program

The scope of program is internal coatings/linings for in-scope piping, piping components, heat exchangers, and tanks exposed to closed cycle cooling water, fuel oil, lubricating oil, raw water, treated borated water, and demineralized water where loss of coating or lining integrity could prevent satisfactory accomplishment of any of the component's or downstream component's current licensing basis (CLB) intended functions identified under 10 CFR 54.4(a)(1), (a)(2), or (a)(3). There are no cementitious linings within the scope of the program. The aging effects associated with fire water tank internal lining are managed by the Fire Water System program (DCPP LRA Appendix B2.1.13) instead of the Internal Coatings/Linings on In-Scope Piping, Piping Components, Heat Exchangers, and Tanks program.

If a coating/lining has a qualified life, and it will be replaced prior to the end of its qualified life without consideration of extending the life through condition monitoring, it will not be considered long-lived. Coatings that are not considered to be long lived may be removed from the scope of this program.

Inspection Method and Parameters Inspected

Visual inspections are intended to identify coatings that do not meet acceptance criteria, such as peeling and delamination.

Aging Mechanisms associated with coatings/lining are described as follows:

Blistering	Formation of bubbles in a coating/lining.
Cracking	Formation of breaks in coating/lining that extend through the underlying surface.

Flaking	Detachment of pieces of the coating/lining itself either from its substrate or from previously applied layers.
Peeling	Separation of one or more coats or layers of a coating/lining from the substrate.
Delamination	Separation of one coat or layer form another coat or layer, or from the substrate.
Rusting	Corrosion of the substrate that occurs beneath or through the applied coating/lining.
Spalling	A fragment, usually in the shape of a flake, detached from a concrete member.

Physical damage consists of removal or reduction of the thickness of a coating/lining by mechanical damage. For the purpose of this program, physical damage includes damage which could occur downstream of a throttled valve as a result of cavitation or erosion. It does not include physical damage caused by actions such as installing scaffolding or assembly and disassembly of flanged joints.

Physical testing is intended to identify the extent of potential degradation of the coating/lining.

Inspection Scope

Baseline internal coating/linings inspections will be conducted in the ten-year period prior to the period of extended operation. Subsequent inspections are based on an evaluation by a coating specialist of the effect of a coating/lining failure on the in-scope component's intended function, potential problems identified during prior inspections, and known service life history. However, inspection intervals should not exceed those in the final LR-ISG-2013-01, Appendix C, Table 4a, "Inspection Intervals for Internal Coatings/Linings for Tanks, Piping, Piping Components, and Heat Exchangers."

Extent of Inspections

The extent of baseline and periodic inspections is based on an evaluation of the effect of a coating/lining failure on the in-scope component's intended function(s), potential problems identified during prior inspections, and known service life history; however, the extent of inspection is not any less than the following for each coating/lining material and environment combination.

(1) Tanks – all accessible internal surfaces

(2) Heat exchangers – all accessible internal surfaces

(3) Piping – either inspect a representative sample of 73 1-foot axial length circumferential segments of piping or 50 percent of the total length of each coating/lining material and environment combination, whichever is less. The inspection surface includes the entire inside surface of the 1-foot sample. If geometric limitations impede movement of remote or robotic inspection tools, the number of inspection segments is increased in order to cover an equivalent of 73 1-foot axial length sections. For example, if the remote tool can only be maneuvered to view one-third of the inside surface, 219 feet of pipe is inspected. Where documentation exists that manufacturer recommendations and industry consensus documents (i.e., those recommended in Regulatory Guide (RG) 1.54, or earlier versions of those standards) were complied with during installation, the extent of piping inspections may be reduced to the lesser of 25 1-foot axial length circumferential segments of piping or 20 percent of the total length of each coating/lining material and environment combination.

The coating/lining environment includes both the environment inside the component and the metal to which the coating/lining is attached. Inspection locations are selected based on susceptibility to degradation and consequences of failure.

Coating/lining surfaces captured between interlocking surfaces (e.g., flange faces) are not required to be inspected unless the joint has been disassembled to allow access for an internal coating inspection or other reasons. For areas not readily accessible for direct inspection, such as small pipelines, heat exchangers, and other equipment, consideration is given to the use of remote or robotic inspection tools.

Either of the following (i.e., item (a) or (b)) is an acceptable alternative to the inspections in this AMP when:

(1) loss of coating or lining integrity cannot result in downstream effects such as reduction in flow, drop in pressure, or reduction in heat transfer for in-scope components,

(2) the component's only CLB intended function is leakage boundary (spatial) or structural integrity (attached) as defined in SRP-LR, Table 2.1-4(b),

(3) the internal environment does not contain chemical compounds that could cause accelerated corrosion of the base material if coating/lining degradation resulted in exposure of the base metal,

(4) the internal environment would not promote microbiologically-influenced corrosion of the base metal,

(5) the coated/lined components are not located in the vicinity of uncoated components that could cause a galvanic couple to exist, and

(6) the design for the component did not credit the coating/lining (e.g., the corrosion allowance was not zero).

If the above 6 criteria are met, then either of the following (i.e., item (a) or (b)) is an acceptable alternative to the inspections recommended in this AMP:

(a) A representative sample of external wall thickness measurements can be performed every 10 years commencing 10 years prior to the period of extended operation to confirm the acceptability of the corrosion rate of the base metal. For heat exchangers and tanks, a representative sample includes 25 percent coverage of the accessible external surfaces. For piping, a representative sample size is defined above. The grid dimensions for the representative sample should be consistent with those for inspections for flow-accelerated corrosion.

(b) In lieu of external wall thickness measurements, use GALL Report AMP XI.M36, "External Surfaces Monitoring of Mechanical Components," and AMP XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components," or other appropriate internal surfaces inspection program (e.g., AMP XI.M20, AMP XI.M21A) to manage loss of coating or lining integrity.

In addition, where loss of coating or lining integrity cannot result in downstream effects such as reduction in flow, drop in pressure, or reduction in heat transfer for in-scope components, a representative sample of external wall thickness measurements can be performed every 10 years commencing 10 years prior to the period of extended operation to confirm the acceptability of the corrosion rate of the base metal in lieu of visual inspections of the coatings/linings. A representative sample size is described above with grid dimensions being those consistent with inspections for flow-accelerated corrosion.

Coating Specialist Qualification

The training and qualification of individuals involved in coating/lining inspections and evaluating degraded conditions is conducted in accordance with an American Society for Testing and Materials (ASTM) International standard endorsed in RG 1.54 including staff limitations associated with a particular standard.

Monitoring and Trending of Coating Degradation

A pre-inspection review of the previous two inspections, when available (i.e., two sets of inspection results may not be available to review for the baseline and first subsequent inspection of a particular coating/lining location), is conducted that includes reviewing the results of inspections and any subsequent repair activities. A coatings specialist prepares the post-inspection report to include: a list and location of all areas evidencing deterioration, a prioritization of the repair areas into areas that must be repaired before returning the system to service and areas where repair can be postponed to the next refueling outage, and where possible, photographic documentation indexed to inspection locations. When corrosion of the base material is the only issue related to coating degradation of the component and external wall thickness measurements are used in lieu of internal visual inspections of the coating, the corrosion rate of the base metal will be trended.

Acceptance Criteria

(1) Indications of peeling and delamination are not acceptable.

(2) Blisters are evaluated by a coatings specialist qualified in accordance with an ASTM International standard endorsed in RG 1.54 including staff limitations associated with use of a particular standard. Blisters should be limited to a few intact small blisters that are completely surrounded by sound coating/lining bonded to the substrate. Blister size and frequency should not be increasing between inspections (e.g., reference ASTM D714-02, "Standard Test Method for Evaluating Degree of Blistering of Paints").

(3) Indications such as cracking, flaking and rusting are to be evaluated by a coatings specialist qualified in accordance with an ASTM International standard endorsed in RG 1.54 including NRC Staff limitations associated with use of a particular standard.

(4) Minor cracking and spalling of cementitious coatings is acceptable provided there is no evidence that the coating is debonding from the base material.

(5) As applicable, wall thickness measurements, projected to the next inspection, meet design minimum wall requirements.

(6) Adhesion testing results, when conducted, meet or exceed the degree of adhesion recommended in engineering documents specific to the coating and substrate.

Corrective Actions

Indications noted will be entered into the DCPP Corrective Action Program for appropriate evaluation or disposition.

Coatings that do not meet acceptance criteria are repaired, replaced, or removed. Testing or examination is conducted to ensure that the extent of repaired or replaced coatings/linings encompasses sound coating/lining material.

As an alternative, coatings exhibiting indications of peeling and delamination may be returned to service if:

(1) physical testing is conducted to ensure that the remaining coating is tightly bonded to the base metal,

(2) the potential for further degradation of the coating is minimized, (i.e., any loose coating is removed, the edge of the remaining coating is feathered);

(3) adhesion testing using ASTM International standards endorsed in RG 1.54 is conducted at a minimum of three sample points adjacent to the defective area;

(4) an evaluation is conducted of the potential impact on the system, including degraded performance of downstream components due to flow blockage and loss of material of the coated component; and

(5) follow-up visual inspections of the degraded coating are conducted within two years from detection of the degraded condition, with a re-inspection within an additional two years, or until the degraded coating is repaired or replaced.

If coatings/linings are credited for corrosion prevention (e.g., corrosion allowance in design calculations is zero) and the base metal has been exposed or it is beneath a blister, the component's base material in the vicinity of the degraded coating/lining is examined to determine if the minimum wall thickness is met and will be met until the next inspection.

If a blister is not repaired, physical testing is conducted to ensure that the blister is completely surrounded by sound coating/lining bonded to the surface. Physical testing consists of adhesion testing using ASTM International standards endorsed in RG 1.54. Where adhesion testing is not possible due to physical constraints, another means of determining that the remaining coating/lining is tightly bonded to the base metal is conducted such as lightly tapping the coating/lining. Acceptance of a blister to remain in-service should be based both

on the potential effects of flow blockage and degradation of the base material beneath the blister.

LRA Sections 2.1.5.15, 3.1.2.1.2, 3.3.2.1.3, 3.3.2.1.4, 3.3.2.1.5, 3.3.2.1.8, 3.3.2.1.12, 3.3.2.1.13, 3.3.2.1.17, 3.3.2.1.19, 3.4.2.1.1, and 3.4.2.1.4, and Tables 2.1-2, 3.1.2-2, 3.3.2-3, 3.3.2-4, 3.3.2-5, 3.3.2-8, 3.3.2-12, 3.3.2-13, 3.3.2-17, 3.3.2-19, 3.4.2-1, and 3.4.2-4 are revised as shown in this Enclosure to identify systems and components with internal coatings. LRA Sections A1.9, A1.10, A1.13, A1.22, and A1.40, LRA Table A4-1, Items 3, 9, and 74, B1.5, and B2, and new LRA Sections A1.42 and B2.1.42 are included in this Enclosure to identify aging management activities that will be performed to manage loss of coating integrity for in scope components with internal coatings.

2.1.5.15 (LR-ISG-2013-01) Aging Management of Loss of Coating *or Lining* Integrity for Internal ~~Service Level III (Augmented)~~ Coatings*/Linings on In-Scope Piping, Piping components, Heat Exchangers, and Tanks*

~~This draft LR-ISG was issued in draft for public comment.~~ The *staff issued this* ~~draft~~ LR-ISG *to* provide~~s~~ an acceptable approach for managing loss of coating *or lining* integrity in ~~service level III (augmented)~~ *internal* coatings*/linings* for components within the scope of the License Renewal Rule. ~~This draft LR-ISG is discussed PG&E Letter DCL-14-103.~~ *This LR-ISG is discussed in PG&E Letter DCL-15-027.*

Table 2.1-2 NRC Interim Staff Guidance Associated with License Renewal

Issue Number	Purpose	Discussion Status
LR-ISG-2013-01	Aging Management of Loss of Coating *or Lining* Integrity for Internal ~~Service Level III (Augmented)~~ Coatings*/Lining on In-Scope Piping, Piping Components, Heat Exchangers, and Tanks*	The staff has issued ~~for public comment draft~~ LR-ISG–2013-01

3.1.2.1.2 Reactor Coolant System

Materials

The materials of construction for the reactor coolant system component types are:

- *Metallic with Internal Coating/Lining*

Aging Effects Requiring Management

The following reactor coolant system aging effects require management:

- *Loss of coating integrity*

Table 3.1.2-2 Reactor Vessel, Internals, and Reactor Coolant System – Summary of Aging Management Evaluation – Reactor Coolant System (Continued)

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tank	*LBS*	*Carbon Steel (with coating or lining)*	*Treated Borated Water (Int)*	*Loss of coating integrity*	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*	*None*	*None*	*H, 5*

Plant Specific Notes:

5 The Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42) program is used to monitor tanks fabricated from carbon steel (with internal coating or lining) with an internal environment of treated borated water for loss of coating integrity. Reference DCL-15-027, Enclosure 1 in response to LR-ISG-2013-01, Appendix B, Table V.

3.3.2.1.3 Saltwater and Chlorination System

Materials

The materials of construction for the saltwater and chlorination system component types are:

- Metallic with ~~Service Level III (augmented)~~ Internal Coating*/Lining*

Aging Effects Requiring Management

The following saltwater and chlorination system aging effects require management:

- Loss of coating integrity

3.3.2.1.4 Component Cooling Water System

Materials

The materials of construction for the component cooling water system component types are:

- Metallic with ~~Service Level III (augmented)~~ Internal Coating*/Lining*

Aging Effects Requiring Management

The following component cooling water system aging effects require management:

- Loss of coating integrity

3.3.2.1.5 Makeup Water System

Materials

The materials of construction for the makeup water system component types are:

- *Concrete with Internal Coating/Lining*
- Metallic with ~~Service Level III (augmented)~~ Internal Coating*/Lining*

Aging Effects Requiring Management

The following makeup water system aging effects require management:

- Loss of coating integrity

3.3.2.1.8 Chemical and Volume Control System

Materials

The materials of construction for the chemical and volume control system component types are:

- Metallic with ~~Service Level III (augmented)~~ Internal Coating*/Lining*

Aging Effects Requiring Management

The following chemical and volume control system aging effects require management:

- Loss of coating integrity

3.3.2.1.12 Fire Protection System

Materials

The materials of construction for the fire protection system component types are:

- *Concrete with Internal Coating/Lining*
- Metallic with ~~Service Level III (augmented)~~ Internal Coating*/Lining*

Aging Effects Requiring Management

The following fire protection system aging effects require management:

- Loss of coating integrity

3.3.2.1.13 Diesel Generator Fuel Oil System

Materials

The materials of construction for the diesel generator fuel oil system component types are:

- Metallic with ~~Service Level III (augmented)~~ Internal Coating*/Lining*

Aging Effects Requiring Management

The following diesel generator fuel oil system aging effects require management:

- Loss of coating integrity

3.3.2.1.17 Liquid Radwaste System

Materials

The materials of construction for the liquid radwaste system component types are:

- *Metallic with Internal Coating/Lining*

Aging Effects Requiring Management

The following liquid radwaste system aging effects require management:

- *Loss of coating integrity*

3.3.2.1.19 Oily Water and Turbine Sump System

Materials

The materials of construction for the oily water and turbine sump system component types are:

- *Metallic with Internal Coating/Lining*

Aging Effects Requiring Management

The following oily water and turbine sump system aging effects require management:

- *Loss of coating integrity*

Table 3.3.2-3 Auxiliary Systems – Summary of Aging Management Evaluation – Saltwater and Chlorination System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	LBS, PB	Carbon Steel (with coating or lining)	Raw Water (Int)	Loss of coating integrity	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Open-Cycle Cooling Water System (B2.1.9)~~	None	None	H, 3
Valves	LBS, PB	Carbon Steel (with coating or lining)	Raw Water (Int)	Loss of coating integrity	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Open-Cycle Cooling Water System (B2.1.9)~~	None	None	H, 3

Plant Specific Notes:

3 The *Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Open-Cycle Cooling Water System (B2.1.9)~~ program is used to monitor piping and valves fabricated of carbon steel (with internal coating or lining) with an internal environment of raw water (Int) for loss of coating integrity. Reference *PG&E Letter* DCL-*15-027*~~14-103~~, Enclosure 1~~, Attachment 8~~ in response to ~~draft~~ LR-ISG-2013-01, Appendix B, Table VII.

Table 3.3.2-4 Auxiliary Systems – Summary of Aging Management Evaluation – Component Cooling Water System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Heat Exchanger (CCW Heat Exchanger)	PB	Nickel-Alloys (with coating or lining)	Raw Water (Int)	Loss of coating integrity	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Open-Cycle Cooling Water System (B2.1.9)~~	None	None	H, 6
Heat Exchanger (CCW Heat Exchanger)	PB	Copper Alloy (with coating or lining)	Raw Water (Int)	Loss of coating integrity	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Open-Cycle Cooling Water System (B2.1.9)~~	None	None	H, 6
Valve	LBS, PB, SIA	Carbon Steel (with coating or lining)	Closed Cycle Cooling Water (Int)	Loss of coating integrity	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Closed-Cycle Cooling Water System (B2.1.10)~~	None	None	H, 7

Table 3.3.2-4 Auxiliary Systems – Summary of Aging Management Evaluation – Component Cooling 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	Carbon Steel (with coating or lining)	Demineralized Water (Int)	Loss of coating integrity	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)~~	None	None	H, 8
Valve	PB	Copper Alloy (with coating or lining)	Closed Cycle Cooling Water (Int)	Loss of coating integrity	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Closed Cycle Cooling Water System (B2.1.10)~~	None	None	H, 7
Valve	PB	Stainless Steel (with coating or lining)	Closed Cycle Cooling Water (Int)	Loss of coating integrity	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Closed Cycle Cooling Water System (B2.1.10)~~	None	None	H, 7

Plant Specific Notes:

6 The *Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Open Cycle Cooling Water System (B2.1.9)~~ program is used to monitor components of the CCW Heat Exchanger fabricated from nickel-alloys or copper alloys (with internal coating or lining) with an internal environment of raw water (Int) for loss of coating integrity. Reference ~~DCL-14-103, Enclosure 1, Attachment 8~~ *PG&E Letter DCL-15-027, Enclosure 1* in response to ~~draft~~ LR-ISG-2013-01, Appendix B, Table VII.

7 The *Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Closed-Cycle Cooling Water System (B2.1.10)~~ program is used to monitor valves fabricated of carbon steel, copper alloy, and stainless steel (with internal coating or lining) closed cycle cooling water (Int) for loss of coating integrity. Reference ~~DCL-14-103, Enclosure 1, Attachment 8~~ *PG&E Letter DCL-15-027, Enclosure 1* in response to ~~draft~~ LR-ISG-2013-01, Appendix B, Table VII.

8 The *Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting (B2.1.22)~~ program is used to monitor carbon steel (with internal coating or lining) with an internal environment of demineralized water (Int) for loss of coating integrity. Reference ~~DCL-14-103, Enclosure 1, Attachment 8~~ *PG&E Letter DCL-15-027, Enclosure 1* in response to ~~draft~~ LR-ISG-2013-01, Appendix B, Table VII.

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
Piping	PB	Asbestos Cement (with coating or lining)	Raw Water (Int)	Loss of coating integrity	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)~~	None	None	H, 6
Tank	LBS, PB	Carbon Steel (with coating or lining)	Demineralized Water (Int)	Loss of coating integrity	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)~~	None	None	H, 6
Tank	PB	Concrete (with coating or lining)	Raw Water (Int)	Loss of coating integrity	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)~~	None	None	H, 6

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
~~Tank~~	~~PB~~	~~Fiberglass~~	~~Demineralized Water (Int)~~	~~Loss of coating integrity~~	~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)~~	~~None~~	~~None~~	~~H, 6~~

Plant Specific Notes:

6 The ~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting (B2.1.22)~~*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)* program is used to monitor tanks fabricated from concrete, ~~fiberglass,~~ and carbon steel (with coating or lining), and piping fabricated from asbestos cement (with internal coating or lining) ~~for loss of coating integrity~~ with an internal environment of demineralized water (Int) or raw water (Int) *for loss of coating integrity*. Reference ~~DCL-14-103, Enclosure 1, Attachment 8,~~ *PG&E Letter DCL-15-027, Enclosure 1* in response to ~~draft~~ LR-ISG-2013-01, Appendix B, Table VII.

Table 3.3.2-8 Auxiliary Systems – Summary of Aging Management Evaluation – Chemical and Volume Control System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
~~Pulsation Dampener~~	~~LBS~~	~~Elastomer~~	~~Secondary Water (Int)~~	~~Loss of coating integrity~~	~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)~~	~~None~~	~~None~~	~~H, 10~~
Heat Exchanger (Centrifugal Charging)	PB	Carbon Steel (Galvanized)	Lubricating Oil (Int)	Loss of coating integrity	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)~~	None	None	H, 10

Plant Specific Notes:

10 The *Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting (B2.1.22)~~ program is used to monitor ~~pulsation dampers (with internal coating or lining) with an internal environment of secondary water (Int) and~~ centrifugal charging heat exchanger*s* (with internal coating or lining) with an internal environment of lubricating oil for loss of coating integrity . Reference *PG&E Letter DCL-15-027, Enclosure 1*~~DCL-14-103, Enclosure 1, Attachment 8,~~ in response to ~~draft~~ LR-ISG-2013-01, Appendix B, Table VII.

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

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 (with coating or lining)	Raw Water (Int)	Loss of coating integrity	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)~~	None	None	H, 5
Piping	PB	Carbon Steel (Galvanized)	Raw Water (Int)	Loss of coating integrity	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)~~	None	None	H, ~~6~~5
Tank	PB	Carbon Steel (with coating or lining)	Raw Water (Int)	Loss of coating integrity	Fire Water System (B2.1.13)	None	None	H, 6

Plant Specific Notes:

5 The *Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting (B2.1.22)~~ program is used to monitor asbestos concrete piping (with internal coating or lining) *and piping fabricated from carbon steel (with internal coating or lining)* with an internal environment of raw water for loss of coating integrity . Reference ~~DCL-14-103~~ *PG&E Letter DCL-15-027*, Enclosure 1~~, Attachment 8,~~ in response to ~~draft~~ LR-ISG-2013-01, Appendix B, Table VII.

6 The Fire Water System (B2.1.13) program is used to monitor ~~piping fabricated from carbon steel (with internal coating or lining) and~~ tanks fabricated from carbon steel (with internal coating or lining) with an internal environment of raw water for loss of coating integrity. Reference ~~DCL-14-103~~ *PG&E Letter DCL-15-027*, Enclosure 1~~, Attachment 8,~~ in response to ~~draft~~ LR-ISG-2013-01, Appendix B, Table VII.

Table 3.3.2-13 Auxiliary Systems – Summary of Aging Management Evaluation – Diesel Generator Fuel Oil System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tank	PB	Carbon Steel (with coating or lining)	Fuel Oil (Int)	Loss of coating integrity	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)~~	None	None	H, 2

Plant Specific Notes:

2 The *Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting (B2.1.22)~~ program is used to monitor tanks fabricated from carbon steel (with internal coating or lining) with an internal environment of fuel oil for loss of coating integrity. Reference ~~DCL-14-103~~ *PG&E Letter DCL-15-027*, Enclosure 1~~, Attachment 8,~~ in response to ~~draft~~ LR-ISG-2013-01, Appendix B, Table VII.

Table 3.3.2-17 Auxiliary Systems – Summary of Aging Management Evaluation – Liquid Radwaste System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	*LBS*	*Carbon Steel with Elastomer Lining*	*Raw Water (Int)*	*Loss of coating integrity*	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*	*None*	*None*	*H, 9*
Tank	*LBS*	*Carbon Steel (with coating or lining)*	*Raw Water (Int)*	*Loss of coating integrity*	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*	*None*	*None*	*H, 9*
Valve	*LBS*	*Carbon Steel (with coating or lining)*	*Raw Water (Int)*	*Loss of coating integrity*	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*	*None*	*None*	*H, 9*

Plant Specific Notes:

9 The Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42) program is used to monitor piping, tanks, and valves fabricated from carbon steel (with internal coating or lining) with an internal environment of raw water for loss of coating integrity. Reference PG&E Letter DCL-15-027, Enclosure 1 in response to LR-ISG-2013-01, Appendix B, Table VII.

Table 3.3.2-19 Auxiliary Systems – Summary of Aging Management Evaluation – Oily Water and Turbine Sump System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Piping	*LBS*	*Carbon Steel (Galvanized)*	*Raw Water (Int)*	*Loss of coating integrity*	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*	*None*	*None*	*H, 4*

Plant Specific Notes:

4 The Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42) program is used to monitor piping fabricated from carbon steel (with internal coating or lining) with an internal environment of raw water for loss of coating integrity. Reference PG&E Letter DCL-15-027, Enclosure 1 in response to LR-ISG-2013-01, Appendix B, Table VII.

3.4.2.1.1 Turbine Steam Supply System

Materials

The materials of construction for the turbine steam supply system component types are:

- *Metallic with Internal Coating/Lining*

Aging Effects Requiring Management

The following turbine steam supply system aging effects require management:

- *Loss of coating integrity*

3.4.2.1.4 Condensate System

Materials

The materials of construction for the condensate system component types are:

- Metallic with ~~Service Level III (augmented)~~ Internal Coating*/Lining*

Aging Effects Requiring Management

The following condensate system aging effects require management:

- Loss of coating integrity

Table 3.4.2-1 Steam and Power Conversion System – Summary of Aging Management Evaluation – Turbine Steam Supply System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Demineralizer	*LBS*	*Carbon Steel (with coating or lining)*	*Secondary Water (Int)*	*Loss of coating integrity*	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*	*None*	*None*	*H, 9*
Piping	*LBS*	*Carbon Steel (with coating or lining)*	*Secondary Water (Int)*	*Loss of coating integrity*	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*	*None*	*None*	*H, 9*
Piping	*LBS*	*Carbon Steel (with coating or lining)*	*Sodium Hydroxide (Int)*	*Loss of coating integrity*	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*	*None*	*None*	*H, 9*
Piping	*LBS*	*Carbon Steel (with coating or lining)*	*Sulfuric Acid (Int)*	*Loss of coating integrity*	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*	*None*	*None*	*H, 9*
Tank	*LBS*	*Carbon Steel (with coating or lining)*	*Sodium Hydroxide (Int)*	*Loss of coating integrity*	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*	*None*	*None*	*H, 9*

Table 3.4.2-1 Steam and Power Conversion System – Summary of Aging Management Evaluation – Turbine Steam Supply System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Tank	*LBS*	*Carbon Steel (with coating or lining)*	*Sulfuric Acid (Int)*	*Loss of coating integrity*	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*	*None*	*None*	*H, 9*
Valve	*LBS*	*Carbon Steel (with coating or lining)*	*Secondary Water (Int)*	*Loss of coating integrity*	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*	*None*	*None*	*H, 9*
Valve	*LBS*	*Carbon Steel (with coating or lining)*	*Sodium Hydroxide (Int)*	*Loss of coating integrity*	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*	*None*	*None*	*H, 9*
Valve	*LBS*	*Carbon Steel (with coating or lining)*	*Sulfuric Acid (Int)*	*Loss of coating integrity*	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*	*None*	*None*	*H, 9*

Plant Specific Notes:

9 The Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42) program is used to monitor demineralizers, piping, tanks and valves fabricated from carbon steel (with internal coating or lining) with an internal environment of secondary water, sodium hydroxide, or sulfuric acid for loss of coating integrity. Reference PG&E Letter DCL-15-027, Enclosure 1 in response to LR-ISG-2013-01, Appendix B, Table VIII.

Table 3.4.2-4 Steam and Power Conversion System – Summary of Aging Management Evaluation – Condensate System

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG-1801 Vol. 2 Item	Table 1 Item	Notes
Demineralizer	LBS	Carbon Steel (with coating or lining)	Secondary Water (Int)	Loss of coating integrity	*Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components (B2.1.22)~~	None	None	H, 5

Plant Specific Notes:

5 The *Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (B2.1.42)*~~Inspection of Internal Surfaces in Miscellaneous Piping and Ducting (B2.1.22)~~ program is used to monitor condensate polisher demineralizers fabricated from carbon steel (with internal coating or lining) with an internal environment of secondary water for loss of coating integrity. Reference *PG&E Letter* ~~DCL-14-103~~*DCL-15-027*, Enclosure 1~~, Attachment 8~~ in response to ~~draft~~ LR-ISG-2013-01, Appendix B, Table VIII.

A1.9 OPEN CYCLE COOLING WATER SYSTEM

The Open-Cycle Cooling Water System program manages cracking, loss of material, *and* reduction of heat transfer for components ~~, and loss of integrity for Service Level III (augmented) internal coatings~~ that are exposed to the raw water of the DCPP OCCW system. The DCPP OCCW system is the auxiliary saltwater (ASW) system. Components within the scope of the OCCW System program are components of the ASW system and the component cooling water heat exchangers that are cooled by the ASW system. The program includes surveillance and control techniques to manage aging effects caused by biofouling, corrosion, erosion, protective coating failures, and silting in components of the ASW system or structures and components serviced by the ASW system that are within the scope of license renewal. The program also includes periodic visual inspections and non-destructive examinations to detect biofouling, defective coatings, and degraded piping and components of, systems and components. The program also currently performs periodic CCW heat exchanger performance testing to ensure that the effects of aging on components are adequately managed for the period of extended operation. The program is consistent with commitments as established in PG&E Letters DCL-90-027, dated January 26, 1990, and DCL-91-286, dated November 25, 1991, in response to NRC Generic Letter 89-13, *Service Water System Problems Affecting Safety-Related Components*, including Supplement 1.

~~As discussed in PG&E Letter DCL-14-103, Enclosure 1, Attachment 8, in response to draft LR-ISG-2013-01, the program includes visual inspections of Service Level III (augmented) internal coatings. For coated surfaces determined to not meet the acceptance criteria, physical testing is performed where physically possible (i.e., sufficient room to conduct testing). The test consists of destructive or nondestructive adhesion testing using ASTM International Standards endorsed in RG 1.54, "Service Level I, II, and III Protective Coatings Applied to Nuclear Plants." The training and qualification of individuals involved in coating inspections are conducted in accordance with ASTM International Standards endorsed in RG 1.54 including guidance from the NRC associated with a particular standard.~~

A1.10 CLOSED-CYCLE COOLING WATER SYSTEM

The Closed-Cycle Cooling Water System program manages loss of material, cracking, *and* reduction in heat transfer~~, and loss of integrity for Service Level III (augmented) internal coatings~~ for components within the scope of license renewal in closed-cycle cooling water systems. The program includes maintenance of system chemistry parameters following the guidance of EPRI TR-107396, Revision 1, *Closed Cooling Water Chemistry Guidelines (EPRI-1007820)* to minimize aging. The program provides for: (1) preventive measures to minimize corrosion including maintenance of corrosion inhibitor, pH buffering agent, and biocide concentrations, and (2) periodic system and component performance testing and inspection. Periodic inspection and testing to confirm function and monitor corrosion is performed in accordance with EPRI TR 107396, Revision 1 (EPRI 1007820), and industry and plant operating experience.

~~As discussed in PG&E Letter DCL-14-103, Enclosure 1, Attachment 8, in response to draft LR-ISG-2013-01, the program includes visual inspections of Service Level III (augmented) internal coatings. For coated surfaces determined to not meet the acceptance criteria, physical testing is performed where physically possible (i.e., sufficient room to conduct testing). The test consists of destructive or nondestructive adhesion testing using ASTM International Standards endorsed in RG 1.54, "Service Level I, II, and III Protective Coatings Applied to Nuclear Plants." The training and qualification of individuals involved in coating inspections are conducted in accordance with ASTM International Standards endorsed in RG 1.54 including guidance from the NRC associated with a particular standard.~~

A1.13 FIRE WATER SYSTEM

The Fire Water System program manages loss of material due to corrosion, including MIC, fouling, flow blockage because of fouling, and loss of integrity for *water-based fire protection systems and* ~~Service Level III (augmented)~~ internal coatings*/linings* for ~~water-based fire protection systems~~*the fire water storage tank within the scope of license renewal*. Internal and external inspections and tests of fire protection equipment are performed consistent, with exceptions identified in PG&E Letter DCL-14-103, Enclosure 1, Attachment 7C, with NFPA-25 (2011 edition). Testing or replacement of sprinklers that have been in place for 50 years is performed in accordance with NFPA-25 (2011 edition). Portions of the deluge systems that are normally dry but periodically subjected to flow and cannot be drained or allow water to collect will undergo augmented testing beyond that in NFPA-25 consisting of volumetric wall thickness examinations. The fire water system is managed by performing routine preventive maintenance, inspections and testing; operator rounds, performance monitoring, and reliance on the corrective action program; and system improvements to address aging and obsolescence issues.

The Fire Water System program will conduct a flow test with air, water, or other medium through each open spray nozzle to verify that deluge systems nozzles are unobstructed. Water flow tests will verify that the deluge system provide full coverage of the equipment it protects. Visual inspections will be performed on firewater piping. Non-intrusive follow-up volumetric examinations will be performed if internal visual inspections detect surface irregularities to determine if wall thickness is within acceptable limits. Visual inspections will evaluate for the presence of sufficient foreign material to obstruct fire water pipe or sprinklers.

Inspections of the firewater tank will be performed to detect loss of material.

As discussed in PG&E Letter DCL-1*5*~~4~~-*027*~~103~~, Enclosure 1, ~~Attachment 8x,~~ in response to ~~draft~~ LR-ISG-2013-01, the program ~~includes~~ *consists of periodic* visual inspections of *the*~~Service Level III (augmented)~~ internal ~~coatings~~*liner of the fire water storage tank exposed to raw water where loss of lining integrity could impact the components' and downstream components' current licensing basis intended function(s)*. For coated surfaces determined to not meet the acceptance criteria, physical testing is performed where physically possible (i.e., sufficient room to conduct testing) *in conjunction with repair, replacement, or removal of the lining*. ~~The test consists of destructive or nondestructive adhesion testing using ASTM International Standards endorsed in RG 1.54, "Service Level I, II, and III Protective Coatings Applied to Nuclear Plants."~~ The training and qualification of individuals involved in coating inspections are conducted in accordance with ASTM International Standards endorsed in RG 1.54 including guidance from the NRC associated with a particular standard.

The Fire Water program implements the recommendations in LR-ISG-2012-02, as discussed in PG&E Letter DCL-14-103, Enclosure 1, Attachments 7C ~~and 8~~ *and the recommendations in LR-ISG-2013-01, as discussed in PG&E Letter DCL-15-027*.

A1.22 INSPECTION OF INTERNAL SURFACES IN MISCELLANEOUS PIPING AND DUCTING COMPONENTS

The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program manages cracking, loss of material, change in material properties, hardening, shrinkage, loss of sealing, crazing, dimensional change, *and* loss of strength of the internal surfaces~~, and loss of integrity for Service Level III (augmented) internal coatings~~ of piping, piping components, and piping elements, ducting, heat exchanger components, polymeric and elastomeric components, tanks, and other components that are not within the scope of other aging management programs (i.e. exposed to environments of plant indoor air; atmosphere/weather; borated water leakage; diesel exhaust; and any water environment other than open-cycle cooling water, treated borated water, and fire water). The program addresses the management of aging internal surfaces of miscellaneous piping and ducting components that are inaccessible during both normal operations and refueling. The program allows internal inspections to be credited if the internal and external material and environment conditions are similar. If inspections of the interior surfaces of accessible components with material, environment, and aging effects similar to those of the interior surfaces of buried or underground components are not conducted, internal visual or external volumetric inspections capable of detecting loss of material on the internal surfaces will be conducted.

The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program uses the work control process to conduct and document inspections. The program performs visual inspections to detect aging effects that could result in a loss of component intended function. Visual inspections of internal surfaces of plant components are performed opportunistically during the conduct of periodic maintenance, predictive maintenance, surveillance testing and corrective maintenance.

Additionally, visual inspections may be augmented by physical manipulation to detect hardening and loss of strength of both internal and external surfaces of elastomers or by sufficient pressurization of the elastomer material to expand the surface in such a way that cracks or crazing is evident. The program also includes volumetric evaluation to detect stress corrosion cracking of the internal surfaces of stainless steel components exposed to diesel exhaust.

At a minimum, in each ten-year period during the period of extended operation, a representative sample of 20 percent of the population (defined as components having the same combination of material, environment, and aging effect), or a maximum of 25 components per population is inspected. Where practical, inspections focus on the bounding or lead components most susceptible to aging because of time in service and severity of operating conditions. Opportunistic inspections continue in each period despite meeting the sampling limit. Inspections (other than opportunistic inspections) will be based on assessments of the potential degradation which could lead to loss of intended function, and on current industry and plant-specific operating experience.

Opportunistic inspections will be based on assessments of the potential degradation which could lead to loss of intended function, and on current industry and plant-specific operating experience.

In accordance with LR-ISG-2012-02, Appendix E, Table 4a, volumetric examination of the refueling water storage tanks, condensate storage tanks, and transfer tanks bottoms from the inside will be performed for each ten-year period starting 10 years before entering the period of extended operation to confirm the absence of loss of material due to corrosion.

~~In response to draft LR-ISG-2013-01, the program includes visual inspections of Service Level III (augmented) internal coatings. For coated surfaces determined to not meet the acceptance criteria, physical testing is performed where physically possible (i.e., sufficient room to conduct testing). The test consists of destructive or nondestructive adhesion testing using ASTM International Standards endorsed in RG 1.54, "Service Level I, II, and III Protective Coatings Applied to Nuclear Plants." The training and qualification of individuals involved in coating inspections are conducted in accordance with ASTM International Standards endorsed in RG 1.54 including guidance from the NRC associated with a particular standard.~~

This program is not intended for use on piping and ducts where repetitive failures have occurred from loss of material that resulted in loss of intended function. However, if the criteria for recurring internal corrosion, as described in LR-ISG-2012-02, Section A are met, the use of this program is allowed if it includes augmented requirements to ensure that any recurring aging effects are adequately managed.

The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program is a new program that will be implemented six months prior to the period of extended operation, except for the volumetric tank inspections, which will begin ten years prior to the PEO in accordance with LR-ISG-2012-02, Appendix E, Table 4a. The Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program implements the recommendations in LR-ISG-2012-02~~ and LR-ISG-2013-01~~, as discussed in PG&E Letter DCL-14-103, Enclosure 1, Attachments 7A, 7B, 7D, 7F, 7G, *and* 7H~~, and 8~~.

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, *rusting,* 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 non-conforming 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.

A1.42 INTERNAL COATINGS/LININGS FOR IN-SCOPE PIPING, PIPING COMPONENTS, HEAT EXCHANGERS, AND TANKS

The program consists of periodic visual inspections of all coatings/linings applied to the internal surfaces of in-scope components exposed to closed-cycle cooling water, raw water, secondary water, sulfuric acid, sodium hydroxide, treated borated water, lubricating oil, or fuel oil where loss of coating or lining integrity could impact the component's and downstream component's current licensing basis intended function(s). For coated/lined surfaces determined to not meet the acceptance criteria, physical testing is performed where physically possible (i.e., sufficient room to conduct testing) in conjunction with repair or replacement of the coating/lining. The training and qualification of individuals involved in coating/lining inspections of non-cementitious coatings/linings are conducted in accordance with ASTM International Standards endorsed in Regulatory Guide 1.54 including guidance from the staff associated with a particular standard. For cementitious coatings, training and qualifications are based on an appropriate combination of education and experience related to inspecting concrete surfaces.

The internal fire water storage tank liner will be managed using the Fire Water System program (A1.13).

The Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks program is a new program that will be implemented no later than six months prior to the period of extended operation with inspections beginning no later than the last refueling outage before the period of extended operation. The Internal Coatings/Linings for In-Scope Piping, Piping Components, Heat Exchangers, and Tanks program implements the recommendations in LR-ISG-2013-01, as discussed in PG&E Letter DCL-15-027, Enclosure 1.

Table A4-1 License Renewal Commitments

Item #	Commitment	LRA Section	Implementation Schedule
3	Enhance the Fire Water System program: (a) Sprinkler heads in service for 50 years will be replaced or representative samples from one or more sample areas will be tested consistent with NFPA 25, *Inspection, Testing and Maintenance of Water-Based Fire Protection Systems, 2011 Edition* guidance. Test procedures will be repeated at 10-year intervals during the period of extended operation, for sprinkler heads that were not replaced prior to being in service for 50 years, to ensure that signs of degradation, such as corrosion, are detected prior to the loss of intended function, and (b) To perform non-intrusive follow-up volumetric examinations if internal visual inspections detect surface irregularities to determine if wall thickness is within acceptable limits. Visual inspections will evaluate for the presence of sufficient foreign material to obstruct fire water pipe or sprinklers *(c)* To be in conformance with LR-ISG-2012-02, Section C as discussed in PG&E Letter DCL-14-103, Enclosure 1, Attachment 7C. ~~(c)~~*(d) To be in conformance with LR-ISG-2013-01 as discussed in PG&E Letter DCL-15-027, Enclosure 1.*	B2.1.13	Program is implemented 5 years before the period of extended operation. Inspections of wetted normally dry piping segments that cannot be drained or that allow water to collect begin 5 years before the period of extended operation. *Internal linings inspections begin no later than the last refueling outage before the period of extended operation.* The program's remaining inspections begin during the period of extended operation
9	Implement the Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components program as described in LRA Section B2.1.22 and to be in conformance with LR-ISG-2012-02 ~~and Draft LR-ISG-2013-01~~ as discussed in PG&E Letter DCL-14-103, Enclosure 1, Attachments 7A, 7B, 7D, 7F, 7G, *and* 7H, ~~and 8~~ respectively~~,~~.	B2.1.22	Six months prior to the period of extended operation
74	~~PG&E will conform to Draft LR-ISG-2013-01~~*Implement the Internal Coatings/Linings for In-*	~~B2.1.9~~ ~~B2.1.10~~	No later than six months before the

Table A4-1 License Renewal Commitments

Item #	Commitment	LRA Section	Implementation Schedule
	Scope Piping, Piping Components, Heat Exchangers, and Tanks program in conformance with LR-ISG-2013-01 as discussed in PG&E Letter DCL~~—~~*15-027*~~14-103~~, Enclosure 1~~,~~ ~~Attachment 8~~.	~~B2.1.13~~ B2.1.~~4~~22	period of extended operation and inspections begin no later than the last refueling outage before the period of extended operation

B1.5 AGING MANAGEMENT PROGRAMS

- *Internal Coatings/Linings on In-Scope Piping, Piping Components, Heat Exchangers, and Tanks (Section B2.1.42)*

B2 AGING MANAGEMENT PROGRAMS

NUREG-1801 NUMBER	NUREG-1801 PROGRAM	PLANT PROGRAM	EXISTING OR NEW	APPENDIX B REFERENCE
XI.M42	*Internal Coatings/Linings on In-Scope Piping, Piping Components, Heat Exchangers, and Tanks*	*Internal Coatings/Linings on In-Scope Piping, Piping Components, Heat Exchangers, and Tanks*	*New*	*B2.1.42*

B2.1.42 Internal Coatings/Linings on In-Scope Piping, Piping Components, Heat Exchangers, and Tanks

Program Description

Proper maintenance of internal coatings/linings is essential to ensure that the intended functions of in-scope components are met.

Degradation of coatings/linings can lead to loss of material, of base materials and downstream effects such as reduction in flow, reduction in pressure or reduction in heat transfer when coatings/linings become debris. This program manages loss of coating integrity for piping, tanks, and heat exchangers fabricated from concrete, nickel alloy, carbon steel, and stainless steel with an internal coating/lining. The program consists of periodic visual inspections of internal coatings/linings exposed to closed-cycle cooling water, raw water, secondary water, sulfuric acid, sodium hydroxide, treated borated water, fuel oil, and lubricating oil. If certain criteria are met, alternatives to these visual inspections are available. Where the visual inspection of the coated/lined surfaces determines that the coating/lining is deficient or degraded, physical tests are performed, where physically possible, in conjunction with the visual inspection. EPRI Report 1019157, "Guideline on Safety-Related Coatings," provides information on the ASTM standard guidelines and coatings. American Concrete Institute (ACI) Standard 201.1R-

08, "Guide for Conducting a Visual Inspection of Concrete in Service," provides guidelines for inspecting concrete. Coating inspections and evaluations will be conducted by coating specialists qualified in accordance with an ASTM International standard endorsed in RG 1.54.

The Internal Coatings/Linings on In-Scope Piping, Piping Components, Heat Exchangers, and Tanks program is a new program that will be implemented no later than six months prior to the period of extended operation. Baseline internal coating/linings inspections will be conducted in the ten-year period prior to the period of extended operation. Subsequent inspections are based on an evaluation by a coating specialist of the effect of a coating/lining failure on the in-scope component's intended function, potential problems identified during prior inspections, and known service life history. Previous inspection results are reviewed prior to conducting subsequent inspections, and a post inspection report is prepared after inspections have been completed.

LR-ISG-2013-01 Consistency

The Internal Coatings/Linings on In-Scope Piping, Piping Components, Heat Exchangers, and Tanks program is a new program that, when implemented, will be consistent with the recommendations of LR-ISG-2013-01.

Exceptions to LR-ISG-2013-01

None

Enhancements

None

Operating Experience

The DCPP Internal Coatings/Linings on In-Scope Piping, Piping Components, Heat Exchangers, and Tanks 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 LR-ISG-2013-01.

Conclusion

The implementation of the Internal Coatings/Linings on In-Scope Piping, Piping Components, Heat Exchangers, and Tanks 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 consistent with the current licensing basis for the period of extended operation.