DiabloCanyonNPEm Resource

From: Green, Kimberly
Sent: Friday, May 07, 2010 11:58 AM
To: Grebel, Terence; Soenen, Philippe R
Cc: DiabloHearingFile Resource; Ferrer, Nathaniel; Rogers, Billy; Gardocki, Stanley; Armstrong, Garry
Subject: Draft RAI Set 2 - Scoping and Screening Methodology
Attachments: Draft RAI Set 2 S&S Methodology.doc

Terry and Philippe,

Attached is Set 2 containing draft RAIs, specifically on the Scoping and Screening Methodology. Please review the attached draft RAIs and let me know when would like to have a teleconference call. In an email to you yesterday, I proposed some dates for the teleconference call. The purpose of the call will be to obtain clarification on the staff's request.

Please let me know if you have any questions.

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Diablo Canyon Nuclear Power Plant, Units 1 and 2 (DCPP)
License Renewal Application (LRA)
Draft Request for Additional Information Set 2
Scoping and Screening Methodology

D-RAI 2.1-1

Background:

10 CFR 54.4, "Scope," states, in part,

> (a) Plant systems, structures and components within the scope of this part are –
>
> > (1) Safety-related systems, structures, and components which are those relied upon to remain functional during and following design-basis events (as defined in 10 CFR 50.49(b)(1)) to ensure the following functions –
> >
> > > (i) The integrity of the reactor coolant pressure boundary;
> > > (ii) The capability to shut down the reactor and maintain it in a safe shutdown condition; or
> > > (iii) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11, as applicable.

Issue:

During the scoping and screening methodology audit, performed on site March 15-18, 2010, the staff determined that the applicant had scoped out of license renewal certain components, which it identified as safety-related in the component database, but when evaluated, were determined to not support a license renewal intended function corresponding to the requirements of 10 CFR 54.4(a)(1).

Request:

The staff requests that the applicant provide a description of the process used to evaluate components, identified as safety-related in the component database, which were determined not support a license renewal intended function corresponding to the requirements of 10 CFR 54.4(a)(1) and were subsequently not included within the scope of license renewal in accordance with 10 CFR 54.4(a)(1).

The staff requests that the applicant perform a review of this issue and indicate if the review concludes that use of the scoping methodology precluded the identification of systems, structures, and components (SSCs) which should have been included within the scope of license renewal in accordance with 10 CFR 54.4(a). Describe any additional scoping evaluations performed to address the 10 CFR 54.4(a) criteria. List any additional SSCs included within the scope as a result of your efforts, and provide the aging management review results for those additional passive and long-lived structures and components.

D-RAI 2.1-2

Background:

10 CFR 54.4, "Scope," states, in part,

> (a) Plant systems, structures and components within the scope of this part are –
>
> > (1) Safety-related systems, structures, and components which are those relied upon to remain functional during and following design-basis events (as defined in 10 CFR 50.49(b)(1)) to ensure the following functions –
> >
> > > (i) The integrity of the reactor coolant pressure boundary;
> > > (ii) The capability to shut down the reactor and maintain it in a safe shutdown condition; or
> > > (iii) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11, as applicable.
> >
> > (2) All nonsafety-related systems, structures and components whose failure could prevent satisfactory accomplishment of any of the functions identified in (a)(1)(i), (ii), or (iii) of this section.

Issue:

1. During the scoping and screening methodology audit, performed on-site March 15-18, 2010, the staff reviewed the LRA and 10 CFR 54.4(a)(2) implementing documents. The staff determined that the applicant had not documented a review of nonsafety-related SSCs, attached to, or which could spatially interact with, certain structures included within the scope of license renewal in accordance with 10 CFR 54.4(a)(1) (the turbine building, intake structure and raw water reservoirs), to determine whether the nonsafety-related SSCs should be included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2).

2. During the scoping and screening methodology audit, performed on-site March 15-18, 2010, the staff reviewed the LRA and the 10 CFR 54.4(a)(2) implementing documents and performed a walkdown of the turbine building. The staff determined that the applicant had not documented a review of nonsafety-related SSCs, located within the turbine building which had the potential to spatially interact with SSCs included within the scope of license renewal in accordance with 10 CFR 54.4(a)(1), to determine whether the nonsafety-related SSCs should be included within the scope of license renewal in accordance with 10 CFR 54.4(a)(2).

Request:

The staff requests that the applicant perform a review of these issues and indicate if the review concludes that use of the scoping methodology precluded the identification of SSCs which should have been included within the scope of license renewal in accordance with 10 CFR 54.4(a). Describe any additional scoping evaluations performed to address the 10 CFR 54.4(a) criteria. List any additional SSCs included within the scope as a result of your

efforts, and provide the aging management review results for those additional passive and long-lived structures and components.

D-RAI 2.1-3

Background:

10 CFR 54.4, “Scope,” states, in part,

> (a) Plant systems, structures and components within the scope of this part are –
>
> > (1) Safety-related systems, structures, and components which are those relied upon to remain functional during and following design-basis events (as defined in 10 CFR 50.49 (b)(1)) to ensure the following functions –
> >
> > > (i) The integrity of the reactor coolant pressure boundary;
> > > (ii) The capability to shut down the reactor and maintain it in a safe shutdown condition; or
> > > (iii) The capability to prevent or mitigate the consequences of accidents which could result in potential offsite exposures comparable to those referred to in 10 CFR 50.34(a)(1), 10 CFR 50.67(b)(2), or 10 CFR 100.11, as applicable.
> >
> > (2) All nonsafety-related systems, structures and components whose failure could prevent satisfactory accomplishment of any of the functions identified in (a)(1)(i), (ii), or (iii) of this section.

Issue

During the scoping and screening methodology audit, performed on-site March 15-18, 2010, the staff discussed consideration of the results of the seismic analysis which identifies both safety-related and nonsafety-related SSCs that perform a function to bring the units to safe shutdown during a seismic event. The specific seismic event is related to the Hosgri fault and is addressed as part of the Diablo Canyon Nuclear Power Plant (DCPP) current licensing basis. The staff determined that the applicant had identified but had not completed the review of SSCs required to support safe-shutdown, as identified in the seismic analysis, to be included within the scope of license renewal in accordance with 10 CFR 54.4(a).

Request:

The staff requests that the applicant perform a review of these issues and indicate if the review concludes that use of the scoping methodology precluded the identification of SSCs which should have been included within the scope of license renewal in accordance with 10 CFR 54.4(a). Describe any additional scoping evaluations performed to address the 10 CFR 54.4(a) criteria. List any additional SSCs included within the scope as a result of your efforts, and provide the aging management review results for those additional passive and long-lived structures and components.

D-RAI 2.2-1

In LRA Table 2.2-1 the applicant states that the hydrogen and nitrogen system is not in the scope of license renewal. However, several license renewal boundary drawings show hydrogen-filled piping and valves highlighted in red, indicating they are within the scope of license renewal under 10 CFR 54.4(a)(2). On license renewal boundary drawing LR-DCPP-08-106708-05, the applicant shows hydrogen lines directly connected to the safety-related volume control tank highlighted red. On license renewal boundary drawing LR-DCPP-09-107709-02, the applicant shows piping and valves supplying nitrogen to the safety-related accumulators inside containment. These lines contain safety-related containment isolation valves. Since the license renewal boundary drawings show components included within the scope of license renewal that contain nitrogen and hydrogen and perform an intended function, then the staff would expect the hydrogen and nitrogen system to be included within the scope of license renewal. The staff requests that the applicant justify the exclusion of the hydrogen and nitrogen system from the scope of license renewal.

D-RAI 2.2-2

During a review of structures included within the scope of license renewal, the staff identified a personnel walkway from the turbine building to the administration building that is directly over the diesel exhaust piping. Based upon discussion during the on-site audit, the walkway was designed with features that would prevent the walkway from adversely affecting the exhaust system. However, the applicant did not include the walkway within the scope of license of renewal. The staff requests that the applicant justify the exclusion of the walkway structure from the scope of license renewal.

D-RAI 2.3-1

In LRA Section 2.1.2.2, the applicant states the guidance used for scoping of attached nonsafety-related piping:

> Nonsafety-related systems, structures, and components (SSCs) that are directly connected to a safety-related SSC were included within the scope of license renewal to ensure structural integrity of the safety-related SSC up to the first seismic anchor or equivalent anchor past the safety/non-safety interface.

The staff noted that on several system license renewal boundary drawings, mostly in the compressed air system, the applicant shows piping in black, i.e., not within the scope of license renewal, that is directly attached to components highlighted in green [within scope under 10 CFR 54.4 (a)(1) or (a)(3)]. For most transitions, the applicant stops scoping at the seismic restraint on the green highlighted component. If these components are within scope under 10 CFR 54.4(a)(1), then following the methodology described above in LRA Section 2.1.2.2, the applicant should have included within scope a segment of the attached nonsafety-related piping up to the first qualified support.

The applicant indicates a note on most of the system drawings that the components are not safety related for pressure boundary. However, the staff noted several instances where the applicant does not consistently show a pressure boundary note at the transition, e.g., SV546B, SV536B on license renewal boundary drawing LR-DCPP-25-106725-38; FM1100A, FM1110A

on license renewal boundary drawing LR-DCPP-25-106725-43, SV585 on license renewal boundary drawing LR-DCPP-25-106725-44, and containment isolation valve 2-8880 on license renewal boundary drawing LR-DCPP-09-107709-02. In instances where the transition was at a check valve, the applicant did not continue scoping on the nonsafety-related side up to the first qualified support. Therefore, these license renewal boundary drawings show where the applicant does not consistently follow its methodology as stated in LRA Section 2.1.2.2.

The staff requests that the applicant provide justification for excluding attached nonsafety-related piping in accordance with its scoping methodology as stated in LRA Section 2.1.2.2.

D-RAI 2.3-2

In accordance with the methodology explained in LRA Section 2.2, the applicant should include within the scope of license renewal any nonsafety-related piping and components physically attached to safety-related components in accordance with 10 CFR 54.4 (a)(2). In the Diablo Canyon Final Safety Analysis Report (FSAR), the applicant states that the hydrogen piping in the auxiliary building is surrounded by guard piping in order to protect the safety-related components from fire in the event the hydrogen piping ruptures.

However, the guard pipe is not identified in the LRA as being within the scope of license renewal. The guard pipe is attached to the safety-related volume control tank, and is also credited as a mitigating feature credited for fire protection in the DCPP FSAR. Therefore, the staff finds that the guard pipe should be included within the scope of license renewal. The staff requests that the applicant justify the exclusion of the hydrogen line guard pipe in the auxiliary building from scope of license renewal in accordance to 10 CFR 54.4 (a)(2).

D-RAI 2.3-3

In LRA Section 2.1.2.2, the applicant stated that nonsafety-related systems and components that contain fluid or steam and are located inside structures that contain safety-related SSCs are included within the scope of license renewal for potential spatial interaction under criterion 10 CFR 54.4(a)(2).

During the audit walkdown, the staff identified water-filled components inside structures containing safety-related components that were not included within the scope of license renewal at the following locations:

a) In the safety-related diesel generator rooms, the staff identified traps filled with water on the nonsafety-related air dryers on both the air start systems and on the air start turbo charger system that were not included in the scope of license renewal.

b) System 27, Oily Water and Turbine Sump System, was identified by the applicant as not within the scope of license renewal. However, during the DCPP audit walkdown the staff identified floor drain lines that transit through areas that contain safety related SSCs, specifically: emergency diesel generator rooms and the component cooling water cubicle.

In accordance with the methodology stated in LRA Section 2.1.2.2, these fluid filled lines should be included within the scope of license renewal. The staff requests that the applicant review the methodology used in determining nonsafety-related liquid filled components located in

structures containing safety-related SSCs, and verify that all required components were included within the scope of license renewal.

D-RAI 2.3-4

In LRA Section 2.1.2.2, the applicant stated that there are safety-related cables in the turbine building. The applicant stated that they used the mitigative approach, as defined in NEI 95-10, to protect the safety-related cables from possible inaction of nonsafety-related SSCs in the turbine building. The staff requests that the applicant provide a summary discussion of the basis for the conclusion that the conduit is adequate to protect the safety-related cables in the turbine building.

D-RAI 2.3-5

In Diablo Canyon FSAR, Section 6.5.2.1.1, Water Sources, the applicant credits several water supplies to maintain shutdown of the reactor in the event the condensate storage tank (CST) is depleted. In several LRA system descriptions, the applicant credits the following components for performing a long term cooling function: residual heat removal (RHR) pumps, condensate hotwell, and raw water reservoir.

The condensate system does not list an intended function for providing long term cooling. Long-term cooling is listed as a function for the raw water reservoir in LRA Section 2.4.11 under the structure description section. In the same section under "Structure Intended Functions," the applicant states, "The earthwork and yard structures provide structural support, shelter, and protection for components relied upon to provide the capability to shutdown the reactor and maintain it in a safe shutdown condition. Therefore, the earthwork and yard structures are within the scope of license renewal based on the criteria of 10 CFR 54.4(a)(1)." However, on license renewal boundary drawing LR-DCPP-16-106716-11, the applicant did not highlight in green a flow path from the raw water reservoir to the auxiliary feedwater pumps (i.e., the highlighted path goes from green to red to green).

The staff requests the applicant to identify the structures and components (SCs) required to perform the long-term cooling function in the event the CST is depleted, and indicate if they are within the scope of license renewal. If the function is credited as a 10 CFR 54.4(a)(1) function, the staff also requests that the applicant provide an evaluation of the surrounding nonsafety-related components for potential impact in accordance with 10 CFR 54.4(a)(2).

D-RAI 2.3-6

NEI 95-10 guidance provides guidance to applicants regarding inclusion of a variety of component types in a commodity group called piping and piping components, where components are similar materials and environments. On license renewal boundary drawings associated with some systems, e.g., spent fuel cooling (TI 653), service cooling water (TI 5005), feedwater (TE 118), auxiliary feedwater (TE 119), the staff noted that there are temperature indicators/elements, but the applicant did not identify the component type "thermowell" in the associated systems' component tables as subject to an aging management review (AMR). However, in several systems, e.g., safety injection, component cooling, etc., the applicant did identify the component type "thermowell" in the associated systems' component tables as subject to an AMR. Thermowells are typically comprised of different material than piping, such as stainless steel. Since the applicant included thermowells in some systems and not in other

systems, and thermowells are typically not the same material as the piping, the staff could not determine the methodology that the applicant used for identifying component types, such as thermowells, in the systems' component tables.

The staff requests that the applicant clarify its methodology for determining which component types were identified in the component type tables, specifically thermowells, and which component types were included as "piping" for the corresponding systems.

D-RAI 2.3.3.14-1

In accordance with 10 CFR 54.4(a)(2), the applicant must include within the scope of license renewal any nonsafety-related components whose failure could prevent satisfactory accomplishment of a safety-related function. On license renewal boundary drawing LR-DCPP-21-106721-03, the applicant included the air start line from the diesel generator air start receiver back to the air compressor for pressure boundary in scope of license renewal under 10 CFR 54.4(a)(1). The applicant stopped scoping the air lines at the air compressor, where the applicant included only the air compressor within scope under 10 CFR 54.4(a)(2), with an intended function of structural integrity (attached).

There does not appear to be a positive isolation, i.e., valve, between the safety and nonsafety-related components. If the pressure boundary of the air compressor fails, and possibly the compressor discharge line to include the air dryer, then the safety-related pressure boundary would be compromised through the feedback line. Therefore, the air compressor and its discharge path should be included within the scope of license renewal because it appears to have a pressure boundary intended function.

The staff requests that the applicant explain the methodology used to determine an endpoint of safety-related piping where positive isolation does not exist, such as a closed isolation valve, to preserve the integrity of the pressure boundary. The staff also requests that the applicant identify if that methodology was used for other systems within the scope of license renewal to determine endpoints, and provide justification that those endpoints are adequate.

RAI 2.3.3.14-2

In LRA Section 2.1.2.2, the applicant referenced NEI 95-10, Appendix F to describe its methods to define license renewal boundaries for safety and nonsafety-related systems that do not have seismic anchors. One of the methods used to define end points for the portion of nonsafety-related piping attached to safety-related piping to be included in the scope of license renewal utilizes a base-mounted component (e.g. pump, heat exchanger, or tank, etc.) that is a rugged component designed not to impose loads on connected piping.

On license renewal boundary drawing LR-DCPP-21-106721-03, depicting the diesel generator air start system, the applicant shows the nonsafety-related piping highlighted upstream of the check valve to the air receiver from the air dryer back to the after filter (labeled on the drawing as 1-1127), where the applicant shows a terminal endpoint, with Note "f.4.a." The legend on license renewal boundary drawing LR-DCPP-21-106701-00 defines Note f.4.a as "a base mounted component that is a rugged component and is designed not to impose loads on connecting piping." However, during the staff's walkdown of air start system during the DCPP audit, the staff determined that the after filter does not qualify as rigid base-mounted equipment. The same condition exists on each of the six starting air systems and the three turbo charger air

assist systems.

The staff requests that the applicant clarify the methodology used to determine the after filter as an endpoint, identify if that methodology was used for other systems within the scope of license renewal to determine endpoints, and provide justification that those endpoints are adequate.

RAI 2.3.4.1-1

In LRA Section 2.1.2.2, the applicant states that nonsafety-related SCs that contain fluid or steam, and are located inside structures that contain safety-related SSCs are included in scope for potential spatial interaction. This methodology would apply to the auxiliary building which contains safety-related components and nonsafety-related fluid filled components.

On license renewal boundary drawing LR-DCPP-04-106704-02, the applicant shows a spatial interaction (SI) flag on the main steam piping in the auxiliary building and subsequent main steam lines not in scope of license renewal inside the auxiliary building boundary. During the DCPP audit walkdown, the staff followed the main steam lines to a point where the lines passed through a wall in the auxiliary building into an ancillary structure between the turbine building and the auxiliary building. Inside this space, there are main steam piping lines that are shown on license renewal boundary drawing LR-DCPP-04-106704-02 as excluded from the scope of license renewal (shown in black). Since it appears that the piping in that area is part of the auxiliary building, and all nonsafety-related fluid filled piping in the auxiliary building was included in the scope of license renewal for spatial interaction, then these main steam lines should also be included within scope.

The staff requests the applicant to evaluate whether these nonsafety-related main steam lines downstream of the SI flag should be included within the scope of license renewal under 10 CFR 54.4 (a)(2).

RAI 2.3.4.3-1

In LRA Section 2.3.4.3, Feedwater System, the applicant stated that one of the system intended functions is, “the flow venturis and associated flow transmitters in each loop are also safety-related because they are used in the calculation of reactor power.” On license renewal boundary drawing LR-DCPP-03-106703-02, the applicant showed the flow elements highlighted in green, indicating that they are within scope under 10 CFR 54.4(a)(1).

However, the applicant shows the tubing connecting the safety-related flow elements to the safety-related flow transmitters highlighted in red, indicating they are within scope under 10 CFR 54.4(a)(2). The tubing and associated valves are required to perform the identified safety-related function. Therefore, the tubing and valves should be included within the scope of license renewal under 10 CFR 54.4(a)(1), thus requiring an evaluation of any nonsafety-related components with the potential for adverse impact to be include in scope of license renewal under 10 CFR 54.4(a)(2). In other systems, e.g., auxiliary feedwater (FT-78), the applicant highlighted such tubing in green, indicating it is within scope under 10 CFR 54.4(a)(1).

The staff requests that the applicant explain whether the associated tubing between the two safety-related components is also safety-related, identify the path of the tubing, and if necessary, perform an evaluation along the tubing path in accordance with 10 CFR 54.4(a)(2), to include the flow transmitters.

RAI 2.3.4.3-2

During review of the auxiliary feedwater system and subsequent plant walkdown, the staff identified cooling water being supplied to a mechanical governor on the turbine-driven auxiliary feedwater pump. The cooling line is shown highlighted in green on license renewal boundary drawing LR-DCPP-03-107703-03, indicating it is included within the scope of license renewal under 10 CFR 54.4(a)(1). The staff noted in LRA Table 2.3.4-5 that the heat exchanger for the mechanical governor was not listed as a component type subject to an AMR. The staff requests the applicant to justify the exclusion of the governor oil heat exchanger as a component type that should be subject to an AMR.