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Fred Dacimo
Vice President
License Renewal

February 27, 2008

Re: Indian Point Units 2 & 3
Docket Nos. 50-247 & 50-286

NL-08-042

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

SUBJECT: **Reply to Request for Additional Information
Regarding License Renewal Application –
Reactor Coolant System and Structures**

Reference: NRC letter dated January 28, 2008; "Request for Additional Information
for the Review of the Indian Point Nuclear Generating Unit Nos. 2 and 3,
License Renewal Application - Reactor Coolant System and Structures"

Dear Sir or Madam:

Entergy Nuclear Operations, Inc is providing, in Attachment I, the additional information requested in the referenced letter pertaining to NRC review of the License Renewal Application for Indian Point 2 and Indian Point 3. The additional information provided in this transmittal addresses staff questions regarding Reactor Coolant System and Structures.

There are no new commitments identified in this submittal. If you have any questions or require additional information, please contact Mr. R. Walpole, Manager, Licensing at (914) 734-6710.

I declare under penalty of perjury that the foregoing is true and correct. Executed on 2-27-08

Sincerely,

Fred R. Dacimo

Fred R. Dacimo *per telecon*
Vice President
License Renewal

A128

NRR

Attachment:

1. Reply to NRC Request for Additional Information Regarding License Renewal Application – Reactor Coolant System and Structures

cc: Mr. Bo M. Pham, NRC Environmental Project Manager
Ms. Kimberly Green, NRC Safety Project Manager
Mr. John P. Boska, NRC NRR Senior Project Manager
Mr. Samuel J. Collins, Regional Administrator, NRC Region I
Mr. Sherwin E. Turk, NRC Office of General Counsel, Special Counsel
IPEC NRC Senior Resident Inspectors Office
Mr. Paul D. Tonko, President, NYSERDA
Mr. Paul Eddy, New York State Dept. of Public Service

ATTACHMENT I TO NL-08-042

REPLY TO NRC REQUEST FOR ADDITIONAL INFORMATION

REGARDING

LICENSE RENEWAL APPLICATION

Reactor Coolant System and Structures

**ENTERGY NUCLEAR OPERATIONS, INC
INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 and 3
DOCKETS 50-247 and 50-286**

INDIAN POINT NUCLEAR GENERATING UNIT NOS. 2 AND 3
LICENSE RENEWAL APPLICATION (LRA)
REQUESTS FOR ADDITIONAL INFORMATION (RAI)
REACTOR COOLANT SYSTEM AND STRUCTURES

The U.S. Nuclear Regulatory Commission (NRC or staff) has reviewed the information related to RCS and Structures provided by the applicant in the Indian Point Nuclear Generating Unit Nos. 2 and 3 (IP2 and IP3) LRA. The staff has identified that additional information is needed to complete the review as addressed below.

Reactor Coolant System

RAI 2.3A.1.2-1 Reactor Vessel Internals

If failure of the following reactor vessel internals could potentially inhibit core coolability in an accident scenario, they would be subject to the requirement in 10 CFR 54.4(a)(2). Justify the exclusion of these components from the scope of license renewal:

- a) rectangular sample tubing
- b) sample tubing springs

Response for RAI 2.3A.1.2-1

As part of the IPA for license renewal, IPEC evaluated the rectangular sample tubing (also known as the irradiation specimen guide) and the sample tubing springs (also known as the specimen plugs). The review included consideration of component functions and potential impact of component failure on the function of other components. The rectangular sample tubing and the sample tubing springs have no license renewal intended function and are not subject to aging management review.

As additional confirmation, IPEC reviewed WCAP-14577 Rev 1-A, "License Renewal Evaluation: Aging Management for Reactor Internals." Section 3.1 of the SER¹ for WCAP-14577 states "The staff found the list of intended functions to be complete and in accordance with 10 CFR 54.4(e)." The list of functions is found in Section 2.1.1 of the SER, and includes "Prevent failure of all non-safety related systems, structures, and components whose failure could prevent any of these (previously listed) functions." Table 2-2 of WCAP-14577A, confirms the IPEC conclusion that no aging management review is required for the rectangular sample tubing and the sample tubing springs.

1. US NRC letter, C. I. Grimes to R. A. Newton (WOG), "Acceptance for Referencing of Generic License Renewal Program Topical Report Entitled "License Renewal Evaluation: Aging Management for Reactor Internals, WCAP-14577, Revision 2, October 2000," 10 February 2001 (included in WCAP-14577 Rev 1-A)

RAI 2.3A.1.3-2 Reactor Coolant Pressure Boundary

Pressurizer manway covers and insert plates have been identified as within the scope of license renewal and subject to an aging management review (AMR) in the LRA (see LRA Table 2.3.1-3-IP2 and 2.3.1-3-IP3). Please clarify whether the manways themselves are within the scope of license renewal and subject to an AMR.

Response for RAI 2.3A.1.3-2

The pressurizer manway itself is a ring integral to the shell of the pressurizer. The manway is part of the pressurizer shell included within the "pressurizer shell and heads" entries in LRA Tables 2.3.1-3-IP2 and 2.3.1-3-IP3. All portions of the manway assembly ("manway cover", "manway insert plate" and the pressurizer shell including the manway itself) are within the scope of license renewal and subject to AMR.

RAI 2.3A.1.3-3

Level sensor vents in the reactor vessel level indication system are not highlighted as components that are subject to an AMR (ref: license renewal drawing LRA-208798-0). The sensor vents appear to provide a reactor coolant pressure boundary. Please state whether the vents associated with the level sensors, as shown on license renewal drawing LRA-208798-0, have a pressure boundary function and, therefore, should be subject to an AMR. If not, justify their exclusion.

Response for RAI 2.3A.1.3-3

The level elements on drawing LRA-208798, LE-1311, 1312, 1321 and 1322, are pressure transmitters. The vents are part of the transmitter body. In accordance with 10CFR54.21(a)(1)(i) and NEI 95-10, pressure transmitters are active components that are not subject to aging management review. The performance or condition of active components is readily monitored through normal operational and surveillance activities.

Structures

RAI 2.4-1

LRA Table 2.2-3 lists the structures within the scope of license renewal, and Section 2.4 provides the scoping and screening results for these structures. LRA Table 2.2-4 lists the structures not within the scope of license renewal. Confirm whether the following structures, that are not included in either of the above tables, are within the scope of license renewal and subject to an AMR.

- (i) Pipe Penetration Tunnel (Ref. IP2 FSAR Section 1.11.4.10)
- (ii) Liquid Waste Storage Building (Ref. IP3 FSAR Sections 16.1.2 & 9.6.4)
- (iii) Condenser Tube Withdrawal/Removal Pit (Ref. IP3 FSAR, Chapter 1, Site Plan Drawing 64513 and IP2 FSAR Figure 10.2-3)
- (iv) Fuel oil storage tank and its foundation at Buchanan Substation (since it provides backup fuel oil for emergency diesels and gas turbines)

If the above structures are within the scope of license renewal, include their scoping, screening and AMR results, as appropriate. If not, provide a justification for their exclusion. Also, update Table 2.2-3 or 2.2-4 as appropriate.

The staff also notes that the structure identified as "Gas Turbine Substation Switchgear Structures and Foundation (IP3)" in LRA Table 2.2-3 is not included in the subsection titled "Description" in LRA Section 2.4.3. Include this structure in Section 2.4.3 and provide its scoping, screening and AMR results, or indicate where these structures and their components are addressed.

Response for RAI 2.4-1

The structures listed in Items (i) thru (iv) above are discussed below regarding whether they are included in the scope of license renewal. If not, in scope justification for their exclusion is provided.

- (i) The pipe penetration tunnel (Ref. IP2 FSAR Section 1.11.4.10) is located in the fan house between elevations 33' and 51'. The fan house, which includes the pipe penetration tunnel, is in scope of license renewal and it is identified in LRA Table 2.2-3 as "Fan House (IP2)".
- (ii) The liquid waste storage building (Ref. IP3 FSAR Sections 16.1.2 & 9.6.4) is located in the basement of the administration building. It is not a separate structure. The liquid waste storage building is not within the scope of license renewal because it does not perform a license renewal intended function. It is included in Table 2.2-4 with line item "Administration Building (IP3) (Service Admin Complex)", since it is within this building structure.
- (iii) The "condenser tube withdrawal/removal pit" (Ref. IP3 FSAR, Chapter 1, Site Plan Drawing 64513 and IP2 FSAR Figure 10.2-3) is part of the turbine building lower level. The turbine buildings, which include condenser tube withdrawal/removal pits, are in the scope of license renewal and are identified in LRA Table 2.2-3 as "Turbine Building and Heater Bay (IP2)" and "Turbine Building and Heater Bay (IP3)".
- (iv) The "fuel oil storage tank foundation" at Buchanan Substation is in the scope of license renewal and is included within line item "Gas Turbine Generator No. 2 and 3, enclosure and fuel tanks foundation" in LRA Table 2.2-3.

No revision to LRA Table 2.2-3 or Table 2.2-4 is required.

"Gas Turbine Substation Switchgear Structures and Foundation (IP3)" are addressed in LRA section 2.4.3, subsection titled "Description", under "Gas Turbine Generator No. 1, 2 and 3 Enclosure and Fuel Tank Foundation".

RAI 2.4.1-1

The first paragraph of Section 5.1.2.1 of the FSAR (IP2 & IP3) states that the containment structure serves as both a biological shield and a pressure container. The biological shield function is not listed among the intended functions for Containment Buildings in the "Description" paragraph of LRA Section 2.4.1 and Table 2.4-1. The definition of the shelter or protection (EN) function in LRA Table 2.0-1 is not consistent with the biological shield function (SH). The biological shield function is protection provided against radiation to plant personnel and the public, and not to safety-related equipment. Please clarify and include biological shield function as an intended function for Containment Buildings in the LRA.

Response for RAI 2.4.1-1

The biological shield function is an intended function for the IPEC containment buildings. This intended function is implicit in the definition of the EN function in LRA Table 2.0-1, which includes "radiation shielding".

RAI 2.4.1-2

From LRA Table 2.4-1, it is not clear if the following components of the Containment Buildings have been screened-in as components subject to an AMR.

- (i) Primary Shield Wall around the Reactor
- (ii) Control Rod Drive Missile Shield
- (iii) Retaining Wall at the Equipment Hatch Entrance and its Missile Shield (Fixed and Removable)
- (iv) Blowout Shield Plug
- (v) Insulation for the Containment Building Liner (limits temperature rise in liner under accident conditions)
- (vi) Protective Coating for liner
- (vii) Water proofing around fuel transfer tube
- (viii) Waterproof membrane for containment wall against backfill
- (ix) Reactor Cavity Seal Ring (see UFSAR Figures 5.1-6 and 5.1-7)
- (x) Seismic Class I Debris Screens at Containment Purge (Ref. FSAR Section 5.1.4.2.4)
- (xi) Stud anchors that anchor the containment liner plate to the concrete shell

Please confirm and clarify their inclusion in LRA Table 2.4-1 or justify their exclusion. For the components that are included within scope and subject to an AMR, identify the appropriate AMR results.

Response for RAI 2.4.1-2

The components identified in (i) thru (xi), listed above, associated with the containment buildings are addressed below with respect to whether they are subject to an AMR.

- (i) The primary shield wall around the reactor is included as part of "beams, columns, interior walls, slabs" listed in LRA Table 2.4-1. AMR results are provided in Table 3.5.2-1.
- (ii) The control rod drive missile shield is included with the line item 'missile shields' listed in Table 2.4-4. AMR results are provided in Table 3.5.2-4.
- (iii) The retaining wall at the equipment hatch entrance is included as part of "beams, columns, interior walls, slabs" listed in LRA Table 2.4-1. AMR results are provided in Table 3.5.2-1. The equipment hatch missile shield (fixed and removable) is included with the line item 'missile shields' listed in Table 2.4-4. AMR results are provided in Table 3.5.2-4.
- (iv) Components/commodities identified in scope that provide missile protection are addressed in LRA Section 2.4-4 and Table 2.4-4. The 'blowout shield plug' is included with the line item 'missile shields' listed in LRA Table 2.4-4. AMR results are provided in Table 3.5.2-4.
- (v) The insulation for the containment building liner is included in Table 2.4-1 with line item "liner insulation jacket". AMR results are provided in Table 3.5.2-1.
- (vi) Protective coatings are not in the scope of license renewal because they do not perform an intended function. Their failure will not prevent satisfactory accomplishment of a safety function.
- (vii) The waterproofing material around the fuel transfer tube is not in scope. Waterproofing membranes have no license renewal intended function.
- (viii) The waterproof membrane for containment wall against backfill is not in scope. Waterproofing membranes have no license renewal intended function.
- (ix) The reactor cavity seal ring identified in USFAR Figures 5.1-6 and 5.1-7 has no license renewal intended function. This component is not safety-related and is not required to demonstrate compliance with regulations identified in 10 CFR 54.4(a)(3). Failure of the seal ring will not prevent satisfactory accomplishment of a safety function. The seal is provided to prevent leakage during refueling operations. This component is not listed in LRA Table 2.2-4 since it does not meet the threshold of a major structural component.
- (x) The seismic Class I debris screens at containment purge identified in UFSAR Section 5.1.4.2.4 do not perform a license renewal intended function. The primary containment isolation valves in the containment purge and pressure relief exhaust ducts are closed during normal plant operation. Failure of the screens will not prevent the ventilation systems from performing their intended function. These components are not required during design basis accidents or for any regulated event. The structural support of this component is included in scope and is included with line item "Structural steel: beams, columns, plates, trusses" listed in LRA Table 2.4-1.
- (xi) The stud anchors that anchor the containment liner plate to the concrete shell are included in the line item "anchorage/embedments" listed in LRA Table 2.4-4. AMR results are provided in Table 3.5.2-4.

RAI 2.4.1-3

Please confirm if the component identified as "Structural Steel: beams, columns, plates, trusses" in LRA Table 2.4-1 includes bracings, welds and bolted connections. Also confirm if the pressurized channel shrouds that are used at liner welded joints (including those at penetrations) are included in a structure/commodity group. If not, justify their exclusion from an AMR. Also, confirm if the components identified as "bellows penetrations" in LRA Table 2.4-1 include the refueling bellows. If not, indicate where in the LRA the refueling bellows have been evaluated.

Response for RAI 2.4.1-3

The component identified as "Structural Steel: beams, columns, plates, trusses" in LRA Table 2.4-1 includes bracing and welds associated with the component. Bolted connections for structures/components are addressed in LRA section 2.4.4 and Table 2.4-4.

The pressurized channel shrouds that are associated with liner welded joints (including those at penetrations) are not addressed as a separate component group. They are integral to the "liner plate and integral attachments" and "Electrical penetration sleeves" and "Mechanical penetration sleeves" listed in LRA Table 2.4-1.

The components identified as "bellows penetrations" in LRA Table 2.4-1 do not include "refueling bellows." The bellows penetrations in LRA Table 2.4-1 are associated with containment piping penetrations. A refueling bellows is not a feature of the IP2 or IP3 design.

RAI 2.4.1-4

LRA Table 2.4-1 includes the components "Polar Crane, rails and girders" and "Manipulator Crane, crane rails and girders." Please confirm if the column structure, bridge and trolley of the polar crane and the bridge, trolley and mast of the manipulator crane are screened-in as subject to an AMR. Also, confirm if fasteners and rail hardware associated with the polar crane and manipulator crane are within scope and subject to an AMR. If not, provide the technical bases for their exclusion. Indicate if there any other hoists and lifting devices (e.g. Reactor Vessel Head Lifting Device, Reactor Internals Lifting Device) that may need to be included as components that are within scope and subject to an AMR. If so, please include in the table and provide associated scoping, screening and AMR results information relevant to the LRA.

Response for RAI 2.4.1-4

The column structure, bridge and trolley of the polar crane and the bridge, trolley and mast of the manipulator crane are screened-in as subject to an AMR. They are subparts of "crane, rails and girders". Fasteners ('structural bolting') and rail hardware ('component support') associated with the polar crane and manipulator crane are within scope of license renewal and subject to an AMR. They are addressed in LRA Section 2.4.4, bulk commodities. No hoists or lifting devices other than those identified in the LRA perform a license renewal intended function, which would make them in the scope of license renewal and subject to AMR.

RAI 2.4.1-5

LRA Table 2.4-1 lists the Equipment Hatch and Personnel Lock as Containment components subject to an AMR. It is not explicitly clear from Table 2.4-1 if the flange double-gaskets, hatch locks, hinges and closure mechanisms that help prevent loss of sealing/leak-tightness for these listed hatches are included within the scope of license renewal and subject to an AMR. Please confirm the inclusion or exclusion of these components within the scope of license renewal. If they were not included, but should be, please provide a description of their scoping and AMR. If they are included elsewhere in the LRA, please indicate the location. If they are excluded from the scope of license renewal, please provide the basis for their exclusion.

Response for RAI 2.4.1-5

The flange double-gaskets, hatch locks, hinges and closure mechanisms that help prevent loss of sealing/leak-tightness for the equipment hatch and personnel lock are within the scope of license renewal. The double gasket seals for "equipment hatch and personnel lock seal" are listed in LRA Table 2.4-1, and are subject to AMR. The AMR results are provided in Table 3.5.2-1. Hatch locks, hinges and closure mechanisms are active components and are therefore not subject to aging management review as discussed in LRA Table 3.5.1, Line Item 3.5.1-17. Satisfactory performance of these active components is demonstrated through routine testing under the Containment Leak Rate Program as required by IP2 and IP3-Technical Specification Section 3.6.2.

RAI 2.4.2-1

LRA Table 2.4-2 does not include the debris wall, fixed coarse screens, fine mesh traveling screens, and gates at the intake structure. It also does not include metal decking, metal siding, grating and ventilation panels for the intake structure enclosure and manhole, ladder and sump of the service water valve pit. Please confirm if these components should be included within the scope of license renewal and subject to an AMR or not. If not, provide justification for not including them. Please clarify explicitly what the "structural steel" component in LRA Table 2.4-2 includes (e.g. beams, plates, welded/bolted connections etc.).

Response for RAI 2.4.2-1

The debris wall, fixed coarse screens, fine mesh traveling screens, and gates at the intake structure are not safety-related and are not required to demonstrate compliance with regulations identified in 10 CFR 54.4(a)(3). System design is such that failure of these components will not prevent satisfactory accomplishment of a safety function. However, their support structures, being integral to the intake structure in some cases (e.g. embedded guides, steel support) are included in the 'structural steel' category listed in LRA Table 2.4.2.

The metal siding for the intake structure enclosure is not safety-related. These components are not required to demonstrate compliance with regulations identified in 10 CFR 54.4(a)(3) and failure of these components will not prevent satisfactory accomplishment of a safety function.

In-scope grating, decking and ladders are bulk commodities addressed in LRA Table 2.4-4.

The ventilation panels for the intake structure enclosure are addressed as "vents and louvers" listed in LRA Table 2.4-4.

Manholes are included in LRA Table 2.4-3.

The sump of the service water valve pit is integral to the in scope service water valve pit, thus it is not listed as a separate item.

The "structural steel" component type in LRA Table 2.4-2 includes columns, beams, plates and their welded connections. Structural bolting is a bulk commodity listed in LRA Table 2.4-4.

RAI 2.4.3-1

Section 2.4.3 of the LRA states that the fuel storage buildings have the following intended functions for 10 CFR 54.4(a)(1) and (a)(2): "Maintain integrity of non-safety related components such that safety functions are not affected by maintaining pool water inventory (Units 2 and 3)." LRA Section 2.1.2.2, "Screening of Structures," states that the screening of structural components and commodities was based primarily on whether they perform an intended function.

LRA Table 3.5.2-3, "Turbine Building, Auxiliary Building, and Other Structures Structural Components and Commodities (IP2 and IP3)," identifies structural components subject to aging management based on materials of construction and intended functions for components of structures including the fuel storage buildings. The intended functions listed in Table 3.5.2-3 (e.g., pressure boundary, missile barrier, and shelter or protection) agree with the intended functions listed in LRA Table 2.0-1, "Intended Functions: Abbreviations and Definitions." However, the intended functions for the fuel storage building listed in LRA Section 2.4.3 does not agree with the listed intended functions in LRA Tables 2.0-1 and 3.5.2-3.

Pursuant to 10 CFR 54.21, the LRA must identify and list those structures and components subject to an AMR. Clarify the LRA Section 2.4.3 description of the intended function(s) of the fuel storage building components using the list of intended functions from Table 2.0-1. To satisfy the requirements of 10 CFR 54.21, the clarification must be adequate to reasonably identify the fuel storage building structural components subject to aging management by the component/commodity, material of construction, and intended functions listed in LRA Table 3.5.2-3.

Response for RAI 2.4.3-1

The intended functions listed in Tables 2.0-1 and 3.5.2-3 are component intended functions, which are determined during the screening process. The intended functions in Section 2.4.3, in contrast, are the intended functions of the structure in its entirety and are determined during the scoping process. The scoping process determines whether or not the structure has an intended function (such as providing containment or isolation to mitigate post-accident offsite doses or providing support or protection to safety-related equipment), whereas the screening process identifies those components that support the structure intended function(s) via specific component intended functions (such as providing shelter and protection (EN) or providing support for safety-related equipment (SSR)). The structure and system level functions that are assessed against the scoping criteria of 10 CFR 54.4 are not intended to match the component

level functions defined in LRA Table 2.0-1. While similarities exist between the terminology used for component intended functions versus structure intended functions, a direct correlation between the structure intended functions in Section 2.4 and the component intended functions in the tables in Section 3.5 does not exist.

Consistent with the function stated in Section 2.4.3, components of the fuel storage building perform a component-level license renewal intended function if they are required to maintain pool water inventory.

RAI 2.4.3-2

Section 2.4.3 of the LRA states that the top of the spent fuel pit wall forms the north wall of each unit's fuel building. Unit 2 UFSAR Figure 1.2-4, "Cross Section of Plant," indicates that at least part of the fuel building exterior wall is below grade. LRA Table 2.4-3 lists pressure boundary as an intended function for the concrete component "exterior walls" but does not list pressure boundary as an intended function of the concrete component, "exterior walls-below grade," that represents the fuel building wall.

Update LRA Table 2.4-3 to include the pressure boundary intended function for the spent fuel pit wall that is below grade or provide justification for excluding this intended function.

Response for RAI 2.4.3-2

Entergy concurs that the spent fuel pit wall below grade performs the pressure boundary intended function. LRA Table 2.4-3 and Table 3.5.2-3 are hereby revised to include pressure boundary (PB) intended function for the spent fuel pit wall that is below grade.

RAI 2.4.3-3

LRA Table 2.4-3 does not include the leak chase channel of the IP3 spent fuel pit as a component subject to an AMR. Include this as a component as subject to an AMR or provide justification for its exclusion.

Response for RAI 2.4.3-3

The leak chase channel is an integral attachment to the liner plate, which is subject to AMR and included in line item "Spent fuel pool liner plate and gate" in LRA Table 2.4-3.

RAI 2.4.3-4

LRA Table 2.4-3 lists "Cranes rails and girders" as a component type subject to AMR. It is not clear if this component refers to just crane rails and girders or also refers to the cranes themselves. If it includes the cranes, identify which cranes have been determined to be within the scope of license renewal and if all relevant sub-components ("...including bridge and trolley, rails, and girders") of these in-scope crane systems have been screened in as items requiring an AMR. Identify the specific cranes in each of these structures that are included within the above component type as within scope and subject to an AMR, and those that are excluded,

with technical bases. Confirm if fasteners and rail hardware associated with this component type are in-scope and subject to AMR. If not, provide the technical bases for their exclusion. Are there any other hoists and lifting devices that may need to be included in-scope and subject to AMR? If so, include in the table and provide associated scoping, screening and AMR results information relevant to the LRA.

Response for RAI 2.4.3-4

LRA Table 2.4-3, "cranes rails and girders" includes bridge and trolley and also refers to the cranes themselves. There are no hoists or lifting devices that perform an intended function that would make them in scope and subject to AMR. The specific cranes in scope and subject to AMR are discussed in LRA Section 2.4-1 for containment buildings and in Section 2.4-3 for turbine building(s) and fuel storage building(s).

Fasteners and rail hardware are in scope and subject to AMR. They are considered bulk commodities and are included in LRA Table 2.4-4, line item "structural bolting".

RAI 2.4.3-5

Please confirm if the component identified as "Structural Steel: beams, columns, plates" in LRA Table 2.4-3 includes bracings, welds and bolted connections. If yes, explicitly state so. If not, indicate where they are included. If "Battery Racks" are used as a component (e.g. for emergency diesels), include it as a component subject to an AMR. Also identify Turbine Generator Pedestals and their structural bearing pads, Diesel Generator (DG) Pedestals and the concrete curb around DG foundations as being subject to an AMR.

Response for RAI 2.4.3-5

The component identified as "Structural Steel: beams, columns, plates, trusses" in LRA Table 2.4-3 includes bracings and welds associated with the component. Bolted connections are addressed in LRA Section 2.4.4 and Table 2.4-4.

The in-scope battery racks (e.g. for emergency diesel) are in scope and subject to AMR. They are bulk commodities within line item "component and piping support" in LRA Table 2.4-4.

The turbine generator pedestals, diesel generator (DG) pedestals and the concrete curb around DG foundations are included within the LRA Table 2.4-3 line item 'Floor slabs, interior walls and ceiling' and line item 'Foundations'.

Structural bearing pads associated with the turbine generator pedestal are not in scope because they are not safety-related and not required to demonstrate compliance with regulations identified in 10 CFR 54.4(a)(3). Failure of the bearing pads will not prevent satisfactory accomplishment of a safety function.

RAI 2.4.4-1

From LRA Table 2.4-4, it is not clear if the following bulk commodities have been screened-in as components subject to an AMR.

- (i) Expansion Anchors
- (ii) Vibration Isolation elements
- (iii) Flood Curbs
- (iv) Waterproofing membrane
- (v) Sliding support bearings and sliding support surfaces

Confirm if the above component types apply to the LRA and should be included and screened in as subject to an AMR or justify their exclusion. If they are in scope, include them in LRA Table 2.4-4 and provide AMR results. Also, explicitly state the specific materials that are classified as "Other Materials" in LRA Table 2.4-4.

Response for RAI 2.4.4-1

- (i) Expansion Anchors are addressed in LRA Table 2.4-4 under line item "anchorage/embedments."
- (ii) There are no vibration isolation elements identified in the scope of license renewal and subject to AMR.
- (iii) Flood curbs are included in the review of structures. Considered integral to floor slabs, they are included in the review for those line items identified in LRA Tables 2.4-1 as "beams, columns, interior walls, slabs", Table 2.4-2 as "beams, columns, floor slabs and walls" and Table 2.4-3 as "floor slabs, interior walls, ceilings".
- (iv) Waterproofing membranes are not in scope. Waterproofing membranes are not safety-related and are not required to demonstrate compliance with regulations identified in 10 CFR 54.4(a)(3). Failure of these membranes will not prevent satisfactory accomplishment of a safety function.
- (v) The sliding support bearings and sliding support surfaces identified in scope of license renewal are identified in LRA Table 2.4-1 line item "Lubrite sliding surfaces".

The materials classified as "Other Materials" in LRA Table 2.4-4 are those materials that are not captured by what is considered basic structural materials such as steel or concrete. The material make-up of these commodities is specifically identified in LRA Section 3.5.2.1.4.

RAI 2.4.4-2

Clarify the phrase within parentheses "(insulation, or Insulation)" in the description provided for intended function (1) for insulation in the fourth paragraph of LRA Section 2.4.4. Further, LRA Table 2.4-4 includes bulk commodity component types "insulation jacket" and "insulation" that are subject to an AMR. Based on information provided in LRA Table, it is unclear which insulation (with material) and insulation jacket are included in license renewal

scope and are included in LRA Table 2.4-4. It is also unclear whether insulation and jacketing on the containment liner, reactor vessel, reactor coolant system, main steam and feed water systems have been included. Please provide the following information, limited to insulation that is used to control the maximum temperature of safety-related structural elements.

- (a) Specifically, identify the structures and structural components designated within the license renewal scope that have insulation and/or insulation jacketing, and identify their location in the plant. Identify locations of the thermal insulation that serves an intended function in accordance with 10 CFR 54.4(a)(2) and describe the scoping and screening results of thermal insulation and provide technical basis for its exclusion from the scope of license renewal.
- (b) For insulation and insulation jacketing materials associated with item (a) above that do not require aging management, submit the technical basis for this conclusion, including plant-specific operating experience.
- (c) For insulation and insulation jacketing materials associated with item (a) above that require aging management, indicate the applicable LRA sections that identify the aging management program(s) credited to manage aging.

Response for RAI 2.4.4-2

- (a) The structures and structural components within the license renewal scope that have insulation and/or insulation jacketing that serves an intended function in accordance with 10 CFR 54.4(a)(2) are the containment liner and high-temperature piping at containment piping penetrations. The containment liner insulation is listed in LRA Table 2.4-1. The insulation associated with hot containment penetrations is addressed in LRA Section 2.4.4 and in LRA Table 2.4-4.
- (b) The insulation and insulation jacketing materials associated with item (a) do not require an aging management program because these insulation materials are exposed to indoor air environment and the containment liner insulation is encapsulated in a stainless steel jacket and not subject to external environments. In these environments, these materials have no aging effects requiring management. The OE review specifically considered plant-specific information related to the effects of aging on insulation materials. That review confirmed that no aging effects requiring management are applicable to the insulation materials that are subject to aging management review at IPEC.
- (c) Aging management review results for insulation and insulation jacketing materials are shown in LRA Tables 3.5.2-1 and Table 3.5.2-4. As there are no aging effects requiring management for insulation, no AMP is credited. Insulation materials in indoor air environment are not susceptible to degradation due to the effects of aging.

RAI 3.5A.2-1

Table 3.5.1, item 3.5.1-46, of the LRA states that aging of the fuel pool liners will be managed by the water chemistry program and monitoring of spent fuel pool water level in accordance with Technical Specifications and leakage from the leak chase channel. The table includes the following discussion:

"Monitoring spent fuel pool water level in accordance with Technical Specifications and monitoring leakage from the leak chase channels (Unit 3) will also continue during the period of extended operation."

The monitoring program for Unit 2 differs from that specified for Unit 3 and from that credited in NUREG-1801. The Unit 3 and NUREG-1801 programs involve monitoring leakage from the leak chase channels.

Explain whether the spent fuel pool water level may be insensitive to leakage comparable to the rate of evaporation and could be masked by routine makeup water additions. If spent fuel pool leakage could be masked by evaporation and routine water additions, describe how the proposed monitoring at Unit 2 would provide acceptable indication of a degrading liner or describe an alternative monitoring method (e.g., monitoring of nearby wells).

Response for RAI 3.5A.2-1

Unlike the Unit 3 spent fuel pool, the Unit 2 spent fuel pool does not have leak chase channels. Therefore, no monitoring of leak chase channels can be performed for Unit 2. The monitoring of the spent fuel pool water level is credited along with the Water Chemistry Control – Primary and Secondary Program for managing the effects of aging on the Unit 2 spent fuel pool liner. Routine makeup water additions to compensate for evaporative losses could mask leakage rates that are comparable to the rate of evaporation. Leakage rates, however, that could challenge the intended function of the spent fuel pool to maintain adequate inventory would be indicated by abnormal rates of level decrease and associated abnormal makeup requirements.

In addition, the Water Chemistry Control – Primary and Secondary Program is an existing program that manages aging effects caused by corrosion and cracking mechanisms; i.e., potential causes of leakage. The program relies on monitoring and control of reactor water chemistry based on the EPRI guidelines in TR-105714, Rev. 5, Pressurized Water Reactor Primary Water Chemistry Guidelines, and TR-102134, Rev. 6, Pressurized Water Reactor Secondary Chemistry Guidelines. The effectiveness of the Water Chemistry Control – Primary and Secondary Program at managing degradation of stainless steels in a borated water environment has been demonstrated in industry and IPEC operating experience.

Unit 2 operating experience does include leaks that were not due to the effects of aging. The cause of these leaks was poor workmanship during initial construction of the liner. The identified defects due to the initial poor workmanship have been repaired. Monitoring wells in proximity to the Unit 2 spent fuel pool are used for continued monitoring to identify any potential recurrence of leaks attributed to this cause.