

August 4, 2003

Mr. John L. Skolds
President and Chief Nuclear Officer
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4300 Winfield Road
Warrenville, IL 60555

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE
DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3, AND QUAD CITIES
NUCLEAR POWER STATION, UNITS 1 AND 2, LICENSE RENEWAL
APPLICATION

Dear Mr. Skolds:

By letter dated January 3, 2003, Exelon Generation Company, LLC (EGC) submitted, for the Nuclear Regulatory Commission's (NRC's) review, an application pursuant to 10 CFR Part 54, to renew the operating license for the Dresden Nuclear Power Station (DNPS), Units 2 and 3, and Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2. We are reviewing the information contained in the license renewal application (LRA) and have identified, in the enclosure, areas where additional information is needed to complete its review. Specifically, the enclosed request for additional information (RAI) is from Section 2.3, "Scoping and Screening Results: Mechanical," Section 3.3, "Aging Management of Auxiliary Systems" (fire protection portion), and Appendix B, "Aging Management Programs."

We have provided these RAIs to Messrs. R. Stachniak and F. Polaski of your staff in parts between May 14 - June 13, 2003. We are willing to meet with EGC prior to the submittal of the responses to provide clarifications of the staff's RAIs.

Sincerely,

/RA/

Tae Kim, Senior Project Manager
License Renewal Section A
License Renewal and Environmental Impacts Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos.: 50-237, 50-249, 50-254,
and 50-265

Enclosure: As stated

cc w/enclosures: See next page

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DRESDEN AND QUAD CITIES
LICENSE RENEWAL APPLICATION
REQUEST FOR ADDITIONAL INFORMATION

RAI 2.3.1.1-1

Please verify whether Dresden and/or Quad Cities is equipped with a thermal shield, whose intended function is to provide shielding for the safety-related systems, structures, and components (SSCs), such as the reactor vessel and the internals, from gamma- and neutron-, and thereby, it may be relied upon to minimize irradiation induced embrittlement of the vessel and/or the internals. If the component exists at Quad Cities and/or Dresden, please justify its exclusion from aging management review (AMR); otherwise, submit an AMR for the subject component.

RAI 2.3.1.1-2

Please clarify whether vessel head spray nozzle is included in the license renewal application (LRA) Table 2.3.1-1 as part of the component group, "Nozzles." If not, please provide justification for exclusion of vessel head spray nozzles from AMR.

RAI 2.3.1.1-3

Please indicate whether the following components are considered part of the reactor pressure vessel nozzles, safe ends, attachments and instrument penetrations requiring an AMR. If so, please provide an AMR for the subject components and include them in LRA Table 2.3.1-1:

- Thermal sleeves for core spray and recirculation inlet nozzles;
- Standby liquid control and core differential pressure line;
- Low-pressure coolant injection coupling;

Please indicate whether the nozzles connecting the reactor recirculation system to the connecting piping should be identified as reactor recirculation system components requiring AMR.

RAI 2.3.1.2-1

According to drawing LR-QDC-FSAR-3.9, the steam separator and standpipe assembly are both in scope at Quad Cities. Please explain why per LR-DRE-FSAR-3.9, the steam separator assembly, including the steam separator, steam separator standpipe and steam plenum head, are not in scope at Dresden.

RAI 2.3.1.2-2

According to drawing LR-DRE-FSAR-3.9, steam dryer lifting lugs are in scope at Dresden. Does Quad Cities have steam dryer lifting lugs? If so, please explain why the steam dryer lifting lugs are in scope at Dresden but not in scope at Quad Cities.

Enclosure

RAI 2.3.1.2-3

Please explain why feedwater spargers are not in scope.

RAI 2.3.1.2-4

In accordance with 10CFR54.4(a) criteria, sump screens and vortex suppressors/breakers are in scope of license renewal requiring AMR. Are sump screens and vortex suppressors/breakers in scope at Dresden and Quad Cities? If so, please submit the AMR results to the staff. If not, please explain the reason for their exclusion.

RAI 2.3.1.2-5

The applicant has identified most of the reactor internals requiring AMR. However, there are a few items that normally would be considered part of reactor pressure vessel internals requiring AMR that have not been included in the submitted LRA. Please justify the following exclusions from aging management; otherwise, submit an AMR for the subject component.

- Thermal sleeves for core spray and recirculation inlet nozzles. These sleeves represent pressure boundary and direct flow to core spray spargers and jet pumps, respectively;
- Standby liquid control and core differential pressure line (SLC/core delta P line (pressure boundary PB);
- Please identify all the components that are included in Component Group “Jet pump assemblies,” and also explain why sensing lines are not included in jet pump assemblies; and
- Low pressure coolant injection coupling.

RAI 2.3.1.3-1

Please verify whether the pumps at Quad Cities and/or Dresden, such as the recirculation pumps, are designed with lube motor-oil collection systems, as required under 10 CFR 50, App. R, III O. If they are, please justify its exclusion from aging management; otherwise, submit an AMR for the subject component.

RAI 2.3.1.3-2

Please explicitly identify all of the nozzles, safe ends, vessel shell attachments and instrumentation penetrations included in Component Groups “Nozzles,” “Nozzle Safe Ends” (including core delta P/SLC nozzle safe end), “Vessel Shell attachment welds,” and “Penetrations” (bottom head drain, CRD stub tubes, incore instrument housings, jet pump instrumentation, other instrumentation, standby liquid control), respectively. UFSARs [Updated Final Safety Analysis Reports] for Dresden and Quad Cities do identify the reactor vessel nozzles, safe ends, vessel shell attachments, and instrumentation penetrations at these plants, but it is not clear whether all of these components are included in Table 2.3.1-1 of the LRA.

RAI 2.3.1.3-3

One of the intended functions of the main steam line flow restrictors is to limit steam line flow during a steam line rupture outside of primary containment until the MSIVs [main steam isolation valves] can close, thereby limiting potential radioactive release. Over the extended life of the plant, it is therefore, essential to maintain the flow area of the flow restrictors used in the CLB [current licensing basis] to calculate the amount of steam released. The staff believes that erosion/corrosion due to high energy steam flow can eventually increase this flow area beyond the value used in the CLB. The staff requests the applicant to provide the following information:

- a) Are the main steam line flow restrictors, and their flow restriction function within scope? If not, please explain why not?
- b) If in scope, how will the applicant determine that the flow area does not exceed more than the value used in the CLB, so that the intended functions will be maintained consistent with the CLB for the period of extended operation?

RAI 2.3.2.2-1

High radiation sampling system piping and liquid sampling flow diagram LR-QDC-M-1061-1 does not include check valve 2-1402-71 within the scope of License Renewal. This valve prevents the backflow of water from the ESS fill pump discharge line back to the condensate transfer pump supply line. Failure of this valve could prevent the ESS fill pump system from supporting its intended ESF function. Please explain why this component is not within the scope of the License Renewal Program.

RAI 2.3.2.2-2

Demineralized water system flow diagram LR-DRE-M-366 does not include the suction line, 3-3329-A-B-L, and suction isolation valve, 3-3329-A-500, for condensate make-up pump 3-3318-B within the scope of License Renewal. Failure of these system boundary components could prevent the demineralized water system from performing its ESF function. Please explain why these components are not within the scope of the License Renewal Program.

RAI 2.3.2.3-1

On instrument air piping diagram LR-QDC-M-24-12, line 1-47209-1" is shown within the scope of containment isolation components (PC) system that require an AMR because it provides a safety-related pressure retaining function. Lines 1-47692-1 and 1-4315A which are connected to line 1-470209-1 are not shown in PC system to require an AMR. Similarly for unit 2, lines 2-47692, 2-4315A and 2-47209A which are connected to line 2-470209 on diagram LR-QDC-M-71-7 are not shown in PC system to require an AMR. Please provide AMR for these components, or provide a justification for excluding these components from an AMR.

RAI 2.3.2.3-2

On instrument air piping diagram LR-QDC-M-24-13, boundary breaks between PC system components that require an AMR and instrument air (IA) components are not shown. Please

identify the PC system component boundary breaks and identify where the LRA addresses the AMR for these components or provide a justification for excluding these components from an AMR.

RAI 2.3.2.3-3

On diagram LR-QDC-M-71-8, line 2-47209-1" (E-7) and line 2-4700-2" (D-10) are shown within the scope of PC system components that require an AMR because they provide a safety-related pressure retaining function. Lines 2-47775 and 2-47498 which are connected to lines 2-47209 and 2-4700 are not in PC system requiring an AMR. Please identify where the LRA addresses the AMR for these components, or provide a justification for excluding these components from an AMR.

RAI 2.3.2.3-4

On liquid sampling system diagrams LR-QDC-M-1056-1 and LR-QDC-M-1061-1 boundary breaks between PC system components that require an AMR and other system components are not shown. Please identify the PC system component boundary breaks and identify where the LRA addresses the AMR for these components or provide a justification for excluding these components from an AMR.

RAI 2.3.2.3-5

On Radwaste Ventilation Diagram LR-DRE-M-272, boundary breaks between PC and RW system components are shown at location A-10, but no component in PC system is shown to require an AMR. Please identify the PC system components on the above drawing and where the LRA addresses the AMR for these components or provide a justification for excluding these components from an AMR.

RAI 2.3.2.5-1 (Dresden Units Only)

For Unit 3, the system boundary between the isolation condenser and demineralized water makeup piping system for AMR is shown on flow diagram LR-DRE-M-359 (B-1) for line 3-4399-72. For Unit 2, the similar isolation boundary between the isolation condenser and demineralized water makeup piping system for AMR is not shown on flow diagram LR-DRE-M-28 (B-1) or on flow diagram M-35-1 (A-8) for line 2-4399-72. Please indicate the LR boundary for Unit 2 piping between the isolation condenser and demineralized water makeup system. Please indicate where the LRA address the AMR of these components or provide a justification for excluding these component from an AMR.

RAI 2.3.2.5-2 (Dresden Units Only)

The LR boundary for the clean demineralized water storage tank (2/3-4300) shown on flow diagram LR-DRE-M-35-1 for AMR is not clearly indicated and, therefore it is unclear whether it is covered in isolation condenser system or in demineralized water system. The LR boundaries for line 2/3-43220-4"-H and for line to LI and LT indicate that it is covered in the isolation condenser system. The LR boundaries for line 2/3-43206-6"-H and for line 2/3 4301-3"-L indicate that it is covered in the demineralized water system. These safety-related components

are relied upon to remain functional during and following the design basis events to provide makeup water to the isolation condenser for cooling. Please indicate LR boundary for the tank and connecting piping and identify where the LRA addresses the AMR for these components or provide a justification for excluding these component from an AMR.

RAI 2.3.2.5-3 (Dresden Units Only)

Table 2.3.2-5 Component Groups Requiring Aging Management Review -Isolation Condenser (Dresden only) does not list the Vacuum Breaker 2/3-4399-803 shown on Isolation Condenser makeup system flow diagram LR-DRE-M-4203 as the component requiring AMR. This safety-related component is relied upon to remain functional during and following the design basis events to maintain the pressure boundary for the essential components. Please identify where the LRA addresses the AMR of this component or provide a justification for excluding this component from an AMR.

RAI 2.3.2.5-4 (Dresden Units Only)

- (a) Drawing LR-DRE-M-359, Isolation Condenser Piping, identifies two diaphragm seal components within the boundaries of license renewal; however, these components are not listed in the LRA tables described above. Identify where the LRA addresses the AMR for these diaphragm seal components, or provide a justification for excluding these components from an AMR.
- (b) Dresden Isolation Condenser (IC) System Description describes the presence of a loop seal and manway hatch as components in the isolation condenser system. Neither of these components is mentioned in the Tables 2.3.2-5, 3.2-1, or 3.2-2 of the LRA. Identify where the LRA addresses the AMR for these components, or provide a justification for excluding these components from an AMR.
- (c) Condensate piping diagram LR-QDC-M-16-5 does not include level switch isolation valves 0-33107A and 0-33108A and connecting piping to level switch 0-3341-71A within the scope of License Renewal. Identify where the LRA addresses the AMR for these components, or provide a justification for excluding these components from an AMR.

RAI 2.3.2.7-1

The low pressure coolant injection (LPCI) coupling was identified in the BWRVIP-06 report as a safety-related component. It appears, however, that the component was not identified in the LRA requiring an AMR. If the component exists at Dresden and/or Quad Cities, please justify its exclusion from aging management; otherwise, submit an AMR for the subject component.

RAI 2.3.2.8-1

- (a) The accumulators in the Standby Liquid Control (SLC) system contain synthetic butyl (rubber) bladders. The accumulators dampen the pulsation from the positive displacement pumps reducing system pressure surges. The upper side of the bladder is charged with nitrogen gas to 425-475 psig and the underside is a sodium pentaborate solution environment that receives pulsation from the SLC positive displacement pump discharge. The synthetic butyl material, nitrogen gas and sodium pentaborate

environments and associated aging effects are not included in LRA Table 2.3.2-8. Include this material in the Table 2.3.2-8 and associated AMR in Table 3.2-2, or provide a justification for not including this component in the AMR.

- (b) Dresden and Quad Cities UFSAR Section 9.3.5 for the SLC System indicate the presence of a sparger in the bottom of the sodium pentaborate tank that is used for mixing the boron solution. LRA Table 2.3.2-8 does not identify such a component, its material, and its environment. Identify where the LRA addresses the aging management review for this component, or provide justification for excluding this component and associated aging effects requiring management from Table 2.3.2-8 and Table 3.2.2.

RAI 2.3.2.9-1

While ventilation damper housings are highlighted on the ventilation flow diagrams as within the scope of license renewal, they are not identified in the applicable LRA tables as component groups requiring AMR (see the following examples):

- Standby Gas Treatment System Table 2.3.2-9
- Standby Blackout Building HVAC Table 2.3.3-10
- Reactor Building HVAC Table 2.3.3-8 (Quad Cities HVAC butterfly isolation valve housings)

Clarify whether these components are within the scope of license renewal and subject to an AMR. If so, provide an aging management review for the subject components; otherwise, provide justification for their exclusion.

RAI 2.3.2.9-2

The following five passive components associated with ventilation system ductwork are not identified as within scope of license renewal or subject to an aging management program:

- Ductwork turning vanes
- Ventilation system elastomer seals
- A ventilation equipment vibration isolator flexible connections
- Ductwork test connections
- Ductwork access doors

Clarify whether these components are within the scope of license renewal and subject to an AMR. If so, provide an aging management review for the subject components; otherwise, provide justification for their exclusion.

RAI 2.3.2.9-3

Clarify whether structural sealants used to maintain the power block building pressure boundary envelope (i.e., main control room, auxiliary building, fuel handling building, reactor building) at design pressure with respect to the adjacent areas are included in the scope of license renewal and subject to an aging management review. Provide information relating to structural sealants use as referenced in Table 2.1-3 on page 2.1-15 of NUREG-1800 (Standard Review Plan-

License Renewal). The Standard Review Plan states that an applicant's structural aging management program is expected to address structural sealants with respect to an AMR program. If structural sealants are not in the scope of license renewal, provide justification for their exclusion.

RAI 2.3.2.9-4

The process of evaluating consumables is not described in the LRA. The applicant should state whether its evaluation process for consumables is subject to screening guidance in accordance with Table 2.1-3 of NUREG-1800. If consumables are not considered subject to NUREG-1800 scoping and screening guidance, provide a justification for their exclusion.

RAI 2.3.3.1-1

The reactor building overhead crane is included in the component group "cranes" requiring AMR (Table 2.3.3-1). Table 3.3.1 lists the component group cranes as cranes including bridge and trolleys and rail system in load handling system that require aging management for loss of material due to general corrosion and wear (AMR Ref. No. 3.3.1.14). Identify the specific components of cranes, which are within the scope of licence renewal and subject to AMR.

[Note: As communicated to the cognizant members of the Exelon staff on July 9, 2003, this RAI has been combined with RAI 2.4-9 which will be issued in a separate correspondence.]

RAI 2.3.3.1-2

LRA Section 2.3.3.1 states that the major component of the refueling equipment system includes the refueling platform assembly which consists of refueling platform, fuel grapple, and associated equipment. List components referred to as the "associated equipment," and specify which components (if any) are within the scope of licence renewal and subject to AMR.

RAI 2.3.3.1-3

LRA Section 2.3.3.1 states that the inboard main steam line plugs, vents, and regulators associated with the reactor vessel system are evaluated with the refueling equipment system. Clarify whether any of these components are within the scope of licence renewal and subject to AMR.

RAI-2.3.3.2-1

License renewal boundary drawing LR-DRE-M-32, "Shutdown Reactor Cooling Piping," (at A,7) shows a ½" pipe that is in-scope (colored Green) that goes from the shutdown cooling system (SDCS) pump 2-1002A seal cooler, to drawing LR-DRE-M-39, "Reactor Building Equipment Drains" (at A,8), where it ties into a pipe that goes from valve 2-1001-213A to the same SDCS pump shown on drawing LR-DRE-M-39. However, on drawing LR-DRE-M-39 the pipe is not shown in-scope (not color coded). The staff believes that the run of pipe shown on drawing LR-DRE-M-39 that comes from drawing LR-DRE-M-32, and the pipe it tees into, up to and including valve 2-1001-213A and the SDCS pump, should be in-scope for the same reason the

portion of that pipe on drawing LR-DRE-M-32 is in-scope. This also applies to pumps 2-1002B and C on drawings LR-DRE-M-32 and 39 as well as to pumps 3-1002A, B & C on drawings LR-DRE-M-363 and 369. Please provide a justification for the exclusion of the portion of the piping shown on drawings LR-DRE-M-39 and LR-DRE-M-369.

RAI-2.3.3.2-2

License renewal boundary drawing LR-DRE-M-32, "Shutdown Reactor Cooling Piping," (at C,9) shows relief valve RV 2-1099-29, and the associated piping to the header, in-scope (colored Green). However, the equivalent relief valve, RV 3-1099-29, on LR-DRE-M-363, "Shutdown Reactor Cooling Piping," (at C,9) is shown not in-scope (not color coded). The staff believes that RV 3-1099-29 on LR-DRE-M-363 should be in-scope for the same reason that RV 2-1099-29 on LR-DRE-M-32 is in-scope. The relief valve provides a passive intended function. Please provide a justification for the exclusion of RV 3-1099-29 on LR-DRE-M-363 and the associated piping to the main header.

RAI 2.3.3.3-1

License Renewal Boundary Diagram LR-QDC-M-41-1 for Quad Cities Unit 1 excludes the following sections of piping from the scope of license renewal while piping at both ends of these sections is identified as in scope:

- 1-0314A-1/2"-A: section from Locations A-7 to E-9
- 1-0314B-1/2"-A: section from Locations A-4 to E-2
- 1-0314-2"-A: section from Locations A-5 to A-6
- 1-0313-1"-C: section from Locations B-5 to B-6
- 1-0315-1"-A: section from Locations B-5 to B-6

License Renewal Boundary Diagram LR-QDC-M-83-1 excludes the corresponding sections of Quad Cities Unit 2 from the scope of license renewal.

Please provide a justification for the exclusion of the above sections from the scope of license renewal and the AMR.

RAI 2.3.3.3-2

License Renewal Boundary Diagram LR-QDC-M-41-2 for Quad Cities Unit 1 excludes the piping from the exhaust water header and fittings and the Pressure Indicator 1-0302-77 from the scope of license renewal. However, the corresponding components for Quad Cities Unit 2 are identified as in scope per 10 CFR 54.4(a)(2) (License Renewal Boundary Diagram LR-QDC-M-83-2). Please provide a justification for the exclusion of the above components of Unit 1 from the scope of license renewal and the AMR.

RAI 2.3.3.3-3

Several solenoid valves shown in License Renewal Boundary Diagram LR-QDC-M-41-2 for Quad Cities Unit 1, (e.g., S O1-0302-19A at Location F-1), are identified as within scope of license renewal. However, the piping connections to these valves are excluded from the scope

of license renewal. Please provide a justification for the exclusion of the above components from the scope of license renewal and the AMR.

RAI 2.3.3.3-4

License Renewal Boundary Diagram LR-QDC-M-41-2 for Quad Cities Unit 1 shows the pressure indicator, Component PI 1-032-80, as within scope of license renewal. However, a similar component at the same location, pressure switch, Component PS 1-032-81 is excluded from the scope of license renewal. Please provide a justification for the exclusion of Component PS 1-032-81 from the scope of license renewal and the AMR.

RAI 2.3.3.3-5

License Renewal Boundary Diagram, (e.g., LR-QDC-M-41-2), identified control rod drives as within scope of license renewal. However, Table 2.3.3-3 does not list control rod drives as within scope of license renewal. Please provide a justification for the exclusion of control rod drives from Table 2.3.3-3.

RAI 2.3.3.3-6

License Renewal Boundary Diagram LR-QDC-M-41-2 for Quad Cities Unit 1 shows that the license renewal boundary for 2½" piping section at Location B-10 ends at an undistinguishable location. Explain why the piping section up to and including Valve 1-0301-7 was excluded from the scope of licence renewal. Similarly, explain why the corresponding piping section up to and including Valve 2-0301-7 was excluded from the scope of licence renewal of Quad Cities Unit 2 (License Renewal Boundary Diagram LR-QDC-M-83-2).

RAI 2.3.3.3-7

License Renewal Boundary Diagram LR-QDC-M-83-1 for Quad Cities Unit 2 excludes the following 3/4"-diameter sections of piping between the reducer and the quick disconnect from the scope of license renewal:

- line containing Valve 2-0301-139A at Location A-7
- line containing Valve 2-0301-138A at Location A-7
- line containing Valve 2-0301-137A at Location B-7
- line containing Valve 2-0301-136A at Location C-7
- line containing Valve 2-0301-136B at Location C-4

However, License Renewal Boundary Diagram LR-QDC-M-41-1 shows that the corresponding sections of Quad Cities Unit 1 are included in the scope of license renewal.

Justify the exclusions of the above sections of Quad Cities Unit 2 from the scope of license renewal and the AMR.

RAI 2.3.3.3-8

License Renewal Boundary Diagram LR-DRE-M-34-1 for Dresden Unit 2 shows that the license renewal boundary for 1½” piping section at Location B-5 (cooling water pressure control station) ends at normally open Valve 2-0301-72. Explain why the piping section beyond this value was excluded from the scope of licence renewal. Similarly, explain why the corresponding piping section beyond Valve 3-0301-72 was excluded from the scope of licence renewal of Dresden Unit 3 (License Renewal Boundary Diagram LR-QDC-M-365-1).

RAI 2.3.3.3-9

License Renewal Boundary Diagram LR-DRE-M-365-1 for Dresden Unit 3 excludes the following sections of piping from the scope of license renewal:

- from Valve 3-0301-60 to and including Valve 3-0301-61 at Location B-4
- from Valve 3-0301-53 to and including Valve 3-0301-54 at Location B-2.

However, the corresponding sections of Dresden Unit 2 are included in the scope of license renewal (License Renewal Boundary Diagram LR-DRE-M-34-1).

Justify the exclusions of the above sections of Dresden Unit 3 from the scope of license renewal and the AMR.

RAI 2.3.3.3-10

License Renewal Boundary Diagram LR-DRE-M-34-1 for Dresden Unit 2 shows that the license renewal boundary ends at Valves 2-0301-67A and 2-0301-67B at Locations C-5 and B-5 (stabilizing valves). Explain why the piping section beyond these valves were excluded from the scope of licence renewal. Similarly, explain why the corresponding piping sections beyond Valves 3-0301-67A and 3-0301-67B were excluded from the scope of licence renewal of Dresden Unit 3 (License Renewal Boundary Diagram LR-QDC-M-365-1).

RAI 2.3.3.5-1

The license renewal boundary drawings referenced in LRA Section 2.3.3.5 are intended to identify the fire protection (FP) systems and components (SCs) that are within the scope of license renewal and subject to an aging management review (AMR). The review of these drawings and LRA Section 2.3.3.5 has resulted in the following RAIs:

- (a) Section 2.1.3.5 of the LRA states that technical position papers were developed for FP. These position papers summarize the results of a detailed review of the FP program documents demonstrating compliance with 10 CFR 50.48 and 10 CFR 50 Appendix R, Sections III.G, III.J, III. L, and III.O. It is unclear that these position papers also included the licensing commitments contained in the applicant’s response to Appendix A to the Branch Technical Position (BTP) Auxiliary and Power Conversion System Branch (APCSB) 9.5-1 and the SERs resulting from review of those responses. Please confirm that the scoping documents included all FP licensing commitments, including those prior to 10 CFR 50 Appendix R.

- (b) LRA Section 2.3.3.5 lists “detects fires” as a system purpose and references the fire computer system which includes initiation devices. This fire detection/alarm computer system is not referenced elsewhere in the LRA, for example as part of the scoping and screening of the electrical and instrumentation systems. Please confirm that the fire detection/alarm system is included in the scope of license renewal and provide the AMR of the fire detection/alarm computer system or identify where the system is addressed in the LRA.

- (c) LRA Drawing LR–DRE–M–23–1

The FP piping, valves, fittings, and fire hydrants at location B9 through D10 in Chemical Cleaning Service Water Intake Building and fire hydrants at locations A4 and E7 are not highlighted in the system flow diagram (LR–DRE–M–23–1) as components within the scope of license renewal and subject to an AMR. Additionally, the piping segment within the scope of license renewal does not end at a closed pressure boundary or an isolation valve (such as PIV 1-4199-187 and 188), although these FP components perform a pressure boundary intended function. Clarify whether these FP piping, valves, and fire hydrants are in scope or justify their exclusion. If these components are not in the scope of license renewal, identify the pressure boundary interface and discuss whether the out-of-scope components can be isolated from the components relied upon to perform a pressure boundary intended function.

- (d) LRA Drawing LR–DRE–M–23–4

Service water drops and transformer deluge systems are identified as being out of scope for the Unit 1 portions of the FP piping. Additionally, some of the boundary interfaces are not at a pressure boundary (not at an isolation valve). Clarify which fire suppression service water drops and transformer deluge systems and components should be within the scope of license renewal, and clarify the location of the pressure boundary interface. Justify the exclusion of fire suppression service water drops and transformer deluge systems not within the scope of license renewal.

- (e) LRA Drawing LR–DRE–M–23–5

Certain fire suppression systems, such as service water drops and fire sprinkler systems, installed in the fuel handling building and maintenance shops are not highlighted in the system flow diagram (LR–DRE–M–23–5) as being within the scope of license renewal and subject to an AMR. However, the fire suppression system and its components perform a pressure boundary intended function with rest of the FP system that is in scope and subject to an AMR for license renewal. Clarify which fire suppression SCs are within the scope of license renewal, and justify those which are excluded.

- (f) LRA Drawing LR–DRE–M–4204

The fire sprinkler systems shown in the ISCO Makeup Pump Building Rooms A&B on this drawing are not enclosed in a green box as are other fire sprinkler systems in scope. Clarify if these systems are in scope of license renewal and subject to an AMR, or justify their exclusion.

(g) LRA Drawing LR-QDC-M-27-1

Certain fire hydrants (at locations D1, D2, E4, F7, G1, G2, G3, G6, and G7 associated piping, fittings, and valves), and piping, fittings, and valves (at locations A2, A3, A10, B2, and C9) are not highlighted in the system flow diagram (LR-QDC-M-27-1) as being within the scope of license renewal and subject to an AMR. It is unclear why some hydrants are circled and others are lined through. The staff believes that these components have the FP intended functions within the requirements of 10 CFR 50.48 as stated in 10 CFR 54.4(a)(3). Clarify which of the above FP SCs are within the scope of license renewal and subject to an AMR, and justify those which are excluded.

(h) LRA Drawing Legends

Boundary diagrams for the FP systems contain symbols which are not defined on those drawings or the legends, or are defined on Quad Cities drawings but not on Dresden. Clarify the symbols HC, FH, and a box with an F in it.

(i) Section 5.4.6.3 of the Dresden Nuclear Power Station UFSAR states that the Unit 2/3 diesel-driven fire pump or the Unit 1 diesel-driven fire pump automatically provide a backup supply of river water to the FP system on low system pressure. Sections 2.3.3.5 and 2.3.3.13 of the LRA state that the fire pump diesels for Dresden are evaluated with the FP system. While the fire pump diesels are considered active components and therefore may be excluded from the scope of license renewal, supporting components and subsystems of the fire pump diesels should appear in Table 2.3.3.5 of the LRA. Identify all of the components of the fire pump diesels that are long-lived and passive, and clarify which of the component types listed in LRA Table 2.3.3.5 include these components.

(j) Section 2.3.3.5 of the LRA states that the Halon fire suppression systems are within the FP system license renewal boundary. No system boundary drawings are provided for these systems. Clarify which Halon SCs are in scope of license renewal. Clarify which of the component types listed in LRA Table 2.3.3.5 include these system components.

(k) Page 5.5-7 of Amendment 2 to Quad Cities Nuclear Power Station response to BTP APCS 9.5-1, dated February 1986, references the use of water shields or baffles over switchgear to mitigate fire suppression effects. These shields or baffles are not included within the scope of either the FP system or electrical system sections of the LRA. Confirm that these components are within the scope of the license renewal and subject to an AMR, and identify the LRA section where these components are evaluated, or justify their exclusion.

(l) Portable equipment such as fire extinguishers, self-contained breathing air packs, fire hoses, and portable ductwork are not included in the LRA. Staff believes that these components should be within the scope of the license renewal but exempt from an AMR, such that portable equipment is typically replaced on condition. These standards require replacement of portable equipment based on their condition or performance during testing and inspection. These portable components are not long-lived and are maintained per the National Fire Protection Association (NFPA) standards, therefore an AMR is not required. Identify where in the LRA these components are identified as

being within the scope of license renewal, or provide a technical justification for their exclusion.

RAI 2.3.3.7-1

Ductwork in the main control room HVAC systems is identified on ventilation system flow diagrams referenced in the LRA as within the scope of license renewal. The ductwork performs pressure boundary function. However, it is not included in the AMR results Table 2.3.3-7 of the LRA. Clarify whether the subject ductwork is subject to an AMR. If so, provide appropriate AMR results. If the ductwork is not subject to an AMR, provide justification for its exclusion.

RAI 2.3.3.7-2

The Dresden and Quad Cities ventilation systems that support use of the safe shutdown controls have not been included as part of the scoping and screening process. State whether the ventilation systems used to support the safe shutdown controls are within the scope license renewal and subject to an AMR in accordance with 10CFR54.4(a)(1) and (a)(2). If so, provide the relevant information about the components to enable the staff to complete its review of the AMR result tables in the LRA. If the ventilation systems used to support the safe shutdown controls are not in the scope of license renewal and subject to an AMR, provide justification for their exclusion.

RAI 2.3.3.9-1

The ECCS Corner Room HVAC systems system Table 2.3.3-9 that identifies component groups requiring AMR has not included the following in the scope of license renewal: flexible collars, damper or door gaskets, seals or other soft parts. These types of components were included in the other HVAC systems. State whether these identified components are subject to an AMR and provide the relevant information within Table 2.3.3-9 to enable the staff to complete the license renewal review process. If these components are not subject to an AMR, provide justification for their exclusion.

RAI 2.3.3.10-1

The Standby Blackout Building (SBO) ventilation fan housings are highlighted on the ventilation flow diagrams identified in the LRA as within scope of license renewal. While ventilation fan housings are highlighted as within the scope of license renewal, ventilation fan housings are not identified in application Table 2.3.3-10 that identify component groups requiring AMR. State whether SBO ventilation fan housings are within the scope of license renewal and subject to an AMR. If so, provide an AMR result. If the SBO ventilation fan housings are not in scope, provide justification for their exclusion.

RAI 2.3.3.10-2

The Dresden and Quad Cities ventilation systems used to support fuel handling has not been included as part of the scoping and screening process. State whether the ventilation systems used to support fuel handling are within the scope license renewal and subject to an AMR in accordance with 10CFR54.4(a)(1) and (a)(2). If so, provide an AMR result. If the ventilation

systems used to support fuel handling are not in the scope of license renewal and subject to an AMR, provide justification for their exclusion.

RAI 2.3.3.13-1

Flexible hoses are included within the P&ID boundary for the fuel oil system. However, they are not listed in Table 2.3.3-13. Explain why the flexible hoses are not within the scope of license renewal.

RAI 2.3.3.14-1

Line 1-1655-2"-L is shown on Process Sampling (PS) diagram LR-QDC-M-461-1(E-5) requiring AMR and extends to drawing M-34-1 (C-6). LR interface for AMR between PS and other systems for this line is not shown on drawing M-34-1. Similarly line 2-1655-2"-L is shown on Process Sampling diagram LR-QDC-M-463-1 (C-3) and extends to drawing M-76-1 (C-5). LR interface for AMR between PS and other systems for this line is not shown on drawing M-76-1. Please identify the boundary for these lines between PS and other systems and where the LRA addresses the AMR of these components or provide a justification for excluding these component from an AMR.

RAI 2.3.3.14-2

Line 2-9224 on drawing LR-DRE-M-178 (E-6) and line 3-9224 on drawing LR-DRE-M-421 (C-6) requiring AMR shows coming from main steam tunnel but no drawing number and co-ordinates of main steam tunnel are given for these lines. Similarly line 2-9203 on drawing LRE-DRE-M-178 (F-6) and line 3-9203 on drawing LRE-DRE-M-421 (C-9) requiring AMR shows coming from drawings M-25 and M-356 but no-coordinates of M-25 and M-356 are given for these lines. Please identify the above drawing numbers and coordinates for lines 2-9224, 3-9224, 2-9203 and 3-9204. Also identify the boundary break between PS and other systems for these lines and associated valves and where the LRA addresses the AMR of these components or provide a justification for excluding these component from an AMR.

RAI 2.3.3.15-1

The license renewal boundary drawings referenced in LRA Section 2.3.3.15 are intended to identify the CO₂ fire suppression SCs that are within the scope of license renewal and subject to AMR. The review of these drawings and LRA Section 2.3.3.15 has resulted in the following RAIs:

- (a) The license renewal boundary drawing LR–DRE–M–42 does not include the CO₂ fire suppression system discharge nozzles installed in the Diesel Generators and Alternator-Exciters. The staff believes CO₂ discharge nozzles are passive and long-lived and perform a pressure boundary intended function consistent with rest of the CO₂ fire suppression system in scope. Provide basis for excluding the CO₂ fire suppression system nozzles from the scope of license renewal and subject to an AMR.
- (b) Table 2.3.3-15 of LRA Section 2.3.3.15 references line item 3.3.1.5 of LRA Table 3.3.1, which addresses components in ventilation systems, diesel fuel oil systems, and

emergency diesel generator systems. The components evaluated do not include the CO₂ storage tank, valves or other components. Clarify which components of the CO₂ fire suppression system are addressed by this reference, and confirm the CO₂ storage tank, valves and other components are within the scope of the license renewal and subject to an AMR.

- (c) Drawing LR-QDC-M-30-3 does not show the 7.5 ton CO₂ tank as within the scope of license renewal. This is inconsistent with LRA drawing LR-DRE-M-42. The staff believes that the CO₂ storage tank should be in the scope of license renewal and subject to an AMR. Clarify whether the CO₂ storage tank at Quad Cities is in scope and subject to an AMR or provide justification for its exclusion.

RAI 2.3.3.16-1

The staff observed that there are no references to buried piping in Table 2.3.3-16 of the License Renewal Application. Please provide the basis for not identifying any buried SW piping in Table 2.3.3-16.

RAI-2.3.3.18-1

The staff observed that on the TBCCW system piping flow diagram LR-DRE-M-21 the control rod drive system drain valve 2-3868-B-500 (for pump 2-382-3B) and the associated piping from the header to the drain valve is not shown as in-scope. The corresponding piping and drain valve (2-3868-A-500) for the pump 2-382-3A are shown as within scope on LR-DRE-M-21. Also, not shown as in-scope is a portion of the piping from valve 2-3837-A-500 to the drain valve 2-3867-A-500 (near pump 2-382-3A). Failure of these lines could prevent the system from performing its intended function, which is to provide a flow path for control rod drive pump cooling during Appendix R fire. The piping is passive, long-lived and not subject to qualified life or specified time period and it performs an intended safety function of maintaining system integrity. Please provide basis for exclusion of the valve and piping identified above.

RAI 2.3.3.19-1

Section 2.3.3.19 of the LRA states that, at Dresden, the demineralized water makeup system distribution header provides emergency makeup water to the spent fuel pools. However, the LRA does not cite this purpose as an intended function of the system for license renewal, and the license renewal boundary diagrams of the demineralized water system and fuel pool cooling system do not show the components necessary for this purpose as being within the scope of license renewal. Please provide the basis for concluding that emergency spent fuel pool makeup is not an intended function of the demineralized water makeup system according to the criteria referenced by 10 CFR 54.4(b).

RAI 2.3.3.19-2

License renewal boundary diagrams LR-DRE-M-11-2, LR-QDC-M-12-2, and LR-QDC-M12-3 provide a legend for interpreting most, but not all, of the symbols used on the license renewal boundary diagrams submitted with the LRA. So that the staff may verify that the scoping and screening results in the LRA are in accordance with the criteria of 10 CFR 54.4 and 10 CFR 54.21, please identify the following symbols that the staff could not locate in the legend:

-  (from license renewal boundary diagram LR-DRE-M-366 (E-3))
-  (from license renewal boundary diagram LR-QDC-M-58-4 (C-8))
-  (from license renewal boundary diagram LR-DRE-M-1239-3 (F-6))

Also, what do a small square and an asterisk in a circle next to the square represent (e.g., as shown with Component PI 1-032-80 in License Renewal Boundary Diagram LR-QDC-M-41-2 for Quad Cities Unit 1)?

RAI 2.3.3.19-3

On license renewal boundary diagram LR-QDC-M-58-1 (grid location D-2), an oil drain line for clean demineralized water pump 1/2-4303B is not highlighted as being within the scope of license renewal. Similar oil drain lines for the “A” and “C” clean demineralized water pumps are highlighted as being within scope. For this reason, it is not clear to the staff whether the absence of highlighting on the oil drain line for the “B” pump is an oversight or is justified. Therefore, in light of 10 CFR 54.4(a), please provide the basis for not including this oil drain line (including the piping, valve, and fitting) within the scope of license renewal.

RAI 2.3.3.19-4

On license renewal boundary diagrams LR-DRE-M-35-1 and LR-DRE-M-366, there are numerous occurrences of piping and other components that are not highlighted as being within the scope of license renewal which are connected to piping lines in the demineralized water makeup system that are highlighted as being within scope. It is not apparent to the staff why the unisolable portions of these connected, unhighlighted piping lines (up to the first isolation valve(s)) are not considered to be within the scope of license renewal, in accordance with 10 CFR 54.4(a), to ensure that the in-scope piping line is capable of performing its intended function for license renewal. Particular occurrences of this method of highlighting include the following:

- At grid location D-7 on diagram LR-DRE-M-35-1, unhighlighted piping line 2-4304-2"-L connects to in-scope piping line 2/3-4304-4"-L;
- At grid locations D-6/7 on diagram LR-DRE-M-35-1, 6 unhighlighted piping lines and components connect to in-scope piping line 2/3-4304-4"-L;
- At grid location D-5 on diagram LR-DRE-M-35-1, unhighlighted piping line 2/3-4355-2"-L connect to in-scope piping line 2-4307-4"-L;
- At grid location C-5 on diagram LR-DRE-M-35-1, unhighlighted piping line 2/3-4311-3"-L connect to in-scope piping line 2-4307-4"-L;
- At grid location C-5 on diagram LR-DRE-M-35-1, the highlighting on piping line 2-4307-4"-L ends abruptly at the connection to piping line 2-4313-4"-L, and does not include the piping and other components prior to the downstream isolation valves;

- At grid location F-5 on diagram LR-DRE-M-366, the highlighting on piping line 3-4304-4"-L ends abruptly at the unisolable connection to piping line 3-4313-4"-L, and does not include the piping and other components prior to the downstream isolation valve;
- At grid location D/E-2 on diagram LR-DRE-M-366, three unhighlighted piping lines connect to in-scope piping line 3-4313-4"-L

Please provide the basis for concluding that the successful performance of the intended functions of the demineralized water makeup system does not require the integrity of these unisolable piping lines and other connected components, and that their failure would not prevent other systems from satisfactorily accomplishing their intended functions for license renewal. (As appropriate, a single response may be provided, or each occurrence may be justified individually.) Additionally, if any components are brought within scope in response to this RAI, please evaluate whether an AMR is required for the additional components in accordance with 10 CFR 54.21(a)(1).

RAI 2.3.3.20-1

At grid location E-7 on license renewal boundary diagram LR-QDC-M-725-3, the return path for the residual heat removal service water from the control room HVAC refrigeration condensing unit (i.e., piping line 1/2-57483-3"-0) is not highlighted as being within the scope of license renewal past locked-open valve 0-5799-388. It is not apparent to the staff why the return path is not considered be within the scope of license renewal from valve 0-5799-388 to the point of ultimate discharge (the discharge line continues onto diagrams LR-QDC-M-725-3 and LR-QDC-M-28-1). Please provide the basis for concluding that the piping and other associated components necessary to discharge the flow of residual heat removal service water returning from the control room HVAC refrigeration condensing unit do not meet the license renewal scoping criteria of 10 CFR 54.4(a). Additionally, if any components are brought within scope in response to this RAI, please evaluate whether an AMR is required for the additional components in accordance with 10 CFR 54.21(a)(1).

RAI 2.3.3.20-2

On license renewal boundary diagram LR-QDC-M-79 (grid location A-3), a temperature element connected to the outlet line 2-1043A-14"-L from the residual heat removal heat exchanger is not highlighted as being within the scope of license renewal. The absence of highlighting on this temperature element contrasts with the treatment of similar temperature elements connected to in-scope piping on this diagram (e.g., at grid locations A-2, A-8, and A-9) and at these grid locations on diagram LR-QDC-M-37. For this reason, it is not clear to the staff whether the absence of highlighting on the temperature element at grid location A-3 is an oversight or is justified. Therefore, in light of 10 CFR 54.4(a), please provide the basis for not including this temperature element within the scope of license renewal.

RAI 2.3.3.20-3

The treatment of the four corrosion coupon holders on license renewal boundary diagrams LR-QDC-M-37 and LR-QDC-M-79 is inconsistent. The piping and valves connecting the coupon holders to the outlet line from the residual heat removal heat exchanger are shown as being

within the scope of license renewal for each of these coupon holders except for the one located at C-8 on diagram LR-QDC-M-37. Also, the corrosion coupon holder at B-3 of this diagram is the only one of the four that shows the holder itself as being within scope. It is not clear to the staff whether these inconsistencies in highlighting constitute an oversight or are justified. Therefore, in light of 10 CFR 54.4(a), please explain the scoping discrepancies identified by the staff regarding the corrosion coupon holders.

RAI 2.3.3.20-4

On license renewal boundary diagram LR-QDC-M-37 (grid location D-9), a segment of piping (1-10111C-1"-D) connected to in-scope piping line 1-1003C-12"-D is not highlighted as being within the scope of license renewal. The absence of highlighting on this segment of piping contrasts with the treatment of similar piping segments on this diagram (e.g., at grid locations D-2, F-2, and F-9). For this reason, it is not clear to the staff whether the absence of highlighting on the piping segment located at grid location D-9 is an oversight or is justified. Therefore, in light of 10 CFR 54.4(a), please provide the basis for not including this piping segment within the scope of license renewal.

RAI 2.3.3.20-5

The LRA includes flow elements as an individual entry in the AMR results tables for many of the systems in which they are depicted as being within the scope of license renewal on the associated license renewal boundary diagrams (e.g., demineralized water makeup system and containment cooling service water system). However, for the residual heat removal service water system, the AMR results in LRA Table 2.3.3-20 do not include an entry for flow elements, despite the fact that flow elements are depicted as being within scope on license renewal boundary diagrams LR-QDC-M-79 (grid locations C-1 and B-10) and LR-QDC-M-37 (grid locations B-1 and B-10). Therefore, in light of the screening criteria set forth in 10 CFR 54.21(a)(1), please provide the basis for not including flow elements as an entry in LRA Table 2.3.3-20

RAI 2.3.3.21-1

License renewal boundary diagrams LR-DRE-M-29-2 (Unit 2) and LR-DRE-M-360-2 (Unit 3) show that a high degree of similarity exists between the containment cooling service water systems for Units 2 and 3. Accordingly, the license renewal scoping results are also similar. One difference noted by the staff, however, is that in-scope instruments such as pressure indicators and flow transmitters are highlighted in green on diagram LR-DRE-M-29-2 and in red on diagram LR-DRE-M-360-2. Please explain the basis for this discrepancy so that the staff can verify compliance with 10 CFR 54.4(a).

RAI 2.3.3.21-2

On license renewal boundary diagram LR-DRE-M-360-2 (grid location A-5), a segment of piping connected to in-scope piping line 3-15112-3"-H is not highlighted as being within the scope of license renewal. It is not apparent to the staff why the unisolable portions of this connected, unhighlighted piping line (at least up to the first isolation valve) is not considered to be within the scope of license renewal, in accordance with 10 CFR 54.4(a), to ensure that the in-scope piping line is capable of performing its intended function for license renewal. Also, the treatment of

this piping segment appears to be inconsistent with similar segments on this diagram. Therefore, in light of 10 CFR 54.4(a), please provide the basis for not including this piping segment and associated components within the scope of license renewal.

RAI 2.3.3.21-3

License renewal boundary diagram LR-DRE-M-22 (grid location D-7/8) depicts the discharge line for the containment cooling service water that cools the control room HVAC refrigeration condensing unit (i.e., piping line 2/3-39252-3"-0) discharging to the circulating water discharge header. (The upstream portion of this line continues on diagram LR-DRE-M-3121.) Although the piping and associated components along the intended flowpath are highlighted as being within the scope of license renewal, there are a number of unisolable piping lines connected to the in-scope flowpath at grid location D-7/8 that are not highlighted as being within scope, including the following:

- piping line 2/3-3936-3"-0
- piping line 2/3-3921-6"-0
- piping line 2-3915-16"-0

Please provide the basis for concluding that the successful performance of the intended functions of the containment cooling service water system does not require the integrity of these unisolable piping lines and other connected components, and that their failure would not prevent other systems from satisfactorily accomplishing their intended functions for license renewal. (As appropriate, a single response may be provided, or each occurrence may be justified individually.) Additionally, if any components are brought within scope in response to this RAI, please evaluate whether an AMR is required for the additional components in accordance with 10 CFR 54.21(a)(1).

RAI 2.3.3.22-1

Section 2.3.3.22 of the LRA states that, for both Dresden and Quad Cities, an ice-melt line and gate are required to ensure that the intended function of the ultimate heat sink can be fulfilled. The AMR results in LRA Table 2.3.3-22 appears to include the ice melt line in the piping and fittings category. However, it is not clear whether the ice melt gates are included in one of the entries in this table. Therefore, in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), please state whether the ice melt gates are within the scope of license renewal and subject to an AMR. Additionally, if the ice melt gates are not considered to be within scope and subject to an AMR, please provide a justification.

RAI 2.3.3.22-2

Section 2.3.3.22 of the LRA indicates that, for Dresden, stop logs must be used to isolate the center compartment of the crib house to allow the suction of the containment cooling service water pumps to be flooded. Thus, the stop logs would appear to perform a pressure boundary function to ensure that the ultimate heat sink is capable of performing its intended function for license renewal. However, the staff could not locate an entry for stop logs in LRA Table 2.3.3-22. Therefore, in accordance with 10 CFR 54.4(a) and 10 CFR 54.21(a)(1), please state whether the stop logs are within the scope of license renewal and subject to an AMR.

Additionally, if the stop logs are not considered to be within scope and subject to an AMR, please provide a justification.

RAI 2.3.3.23-1

The design objectives of the spent fuel pool cooling and cleanup system for Dresden 2/3 are to handle the spent fuel pool cooling load and to maintain pool water clarity. Spent fuel pool cooling pumps take suction from the skimmer surge tanks; circulate the warm pool water to the heat exchanger, filter, and demineralizer; and discharge the cooled water back to the spent fuel pool through two parallel lines (2-1910A-6"-K and 2-1910B-6"-K). In the Dresden 2/3 P&I drawings (LR-DRE-M-31 and LR-DRE-M-362), the following portions were highlighted as within scope:

- A portion of one (2-1910B-6"-K) of the two lines as within the scope of license renewal per 10 CFR 54.4(a)(2). The parallel line (2-1910A-6"-K) was not highlighted as within the scope of license renewal.
- A portion of the drain line (from the globe valve, 3-1901-11, to the 6"x4" reducer), which collects the drains from the reactor well and the reactor well seal rupture drain, as within the scope of license renewal per 10 CFR 54.4(a)(2).

No discussion was provided in LRA to justify why only the above cited portions of the spent fuel pool cooling and cleanup system are included in the scope of license renewal and subject to an AMR. The staff believes that the entire spent fuel pool cooling and cleanup system is within the scope of license renewal per 10 CFR 54.4(a)(2) and the passive and long-lived components of the system should be subject to an AMR. Please provide detailed discussion to clarify and justify why only the above cited portions of the spent fuel pool cooling and cleanup system are included in the scope of license renewal and subject to an AMR.

RAI 2.3.3.23-2

In LRA Table 2.2-1, applicant stated that because of differences in plant equipment lay out, some of the fuel pool cooling system piping at Dresden can potentially fall in a way to cause failure of near-by safety related equipment. A similar equipment layout does not exist at the Quad Cities plant.

The design objectives of the spent fuel pool cooling and cleanup system for Quad Cities plant are to handle the spent fuel pool cooling load and to maintain pool water clarity. The staff believes that the entire spent fuel pool cooling and cleanup system is within the scope of license renewal per 10 CFR 54.4(a)(2) and the passive and long-lived components of the system should be subject to an AMR. Please provide detailed discussion to justify why the spent fuel pool cooling and cleanup system is not within the scope of license renewal per 10 CFR 54.4(a)(2), and the justification for excluding the passive and long-lived components of the system from an AMR.

RAI 2.3.3.27-1

Nitrogen Auxiliary Tank 2/3-8554 is shown on diagram LR-DRE-M-4215 in the drywell nitrogen inerting system require an AMR because this tank provides a pressure-retaining function for

the safety-related components. Valve 2/3-8599-761 (D-7) and associated 1" line which connects to above tank is shown as not requiring an AMR review. Also valve 2/3-8599-807 and 803 and connecting pipe and muffler (E-6) is shown as not requiring an AMR review. Please indicate where the LRA addresses the AMR of these components or provide a justification for excluding these components from an AMR.

RAI 2.3.3.27-2

Nitrogen Purge Vaporizer 1/2-8713 is shown on diagram LR-QDC-M-34-3 (C-2) in the drywell nitrogen inerting system to require an AMR because this tank provides a pressure-retaining function for the safety-related components. Lines ½-57163 and ½ -57522 which connects to the vaporizer tank are shown as not requiring an AMR review. Please indicate where the LRA addresses the AMR of these components or provide a justification for excluding these components from an AMR.

RAI 2.3.3.28-1

The staff observed that license renewal boundary drawing LR-QDC-M-70 (B-8), Safe Shutdown Make-up Pump (SSMP) System, shows a 2" pipe that is in-scope (Green) that comes from the service water (SW) system (LR-QDC-M-69-1, F-8) indicating that the water supply for the SSMP room cooler is supplied from SW. LRA Scoping and Screening Results, Section 2.3.3.28, states that the SSMP room coolers are evaluated with the service water system, and LRA Section 2.3.3.16 states that the SW loads include the SSMP room cooler for Quad Cities. However, on SW scoping drawing LR-QDC-M-69-1(F-8) that portion of the SW system is not shown in scope.

Since the SW system shown on LR-QDC-M-69-1, which can supply SW to the SSMP system at the tie-in at F-7, is shown not in-scope, please identify the in-scope source of water for the SSMP room cooler and any resultant changes to Table 2.3.3-16 and affected AMPs.

RAI 2.3.3.28-2

The staff observed that license renewal boundary drawing LR-QDC-M-70 (B-8), Safe Shutdown Make-up Pump (SSMP) System, shows a 2" pipe that is in-scope (Green) that goes to the service water (SW) system (LR-QDC-M-69-1, D-6) indicating that the water return from the SSMP room cooler goes to the SW system and eventually to the circulating water system (LR-QDC-M-28-1, D-5). LRA Scoping and Screening Results, Section 2.3.3.28, states that the SSMP room coolers are evaluated with the service water system. However, on LR-QDC-M-69-1(D-6) the SW system piping from the tie-in from the SSMP system to the tie-in to the circulating water system is shown not in scope.

Since SW, as shown on LR-QDC-M-69-1, from where the pipe from the SSMP ties in at D-6 to where it goes to the circulating water system (LR-QDC-M-28-1, D-5) at G-6 is not shown in-scope please identify the in-scope water discharge path for the SSMP room cooler and any resultant changes to Table 2.3.3-16 and affected AMPs.

RAI 2.3.3.28-3

License renewal boundary diagram LR-QDC-M-70 depicts the safe shutdown makeup system. At grid location F-2, piping line 1-2905-4"-B is shown as continuing at grid location D-9 on diagram LR-QDC-M-46-1. Although the staff examined diagram LR-QDC-M-46-1, this line could not be located. In the place where the staff expected to find the safe shutdown makeup pump system discharge line (based upon the staff's examination of LR-QDC-M-87-1), an end-capped line is depicted on LR-QDC-M-46-1. Please clarify where the safe shutdown makeup pump system discharge line connects to high pressure injection system discharge line, so that the staff may verify that the license renewal scoping boundaries for this system comply with 10 CFR 54.4(a).

RAI 2.3.3.28-4

The LRA includes flow elements as an individual entry in the AMR results tables for many of the systems in which they are depicted as being within the scope of license renewal on the associated license renewal boundary diagrams (e.g., demineralized water makeup system and containment cooling service water system). However, for the safe shutdown makeup pump system, the AMR results in LRA Table 2.3.3-28 do not include an entry for flow elements, despite the fact that they are depicted as being within scope on license renewal boundary diagram LR-QDC-M-70 (grid location D-5). Therefore, in light of the screening criteria set forth in 10 CFR 54.21(a)(1), please provide the basis for not including flow elements as an entry in LRA Table 2.3.3-28.

RAI 2.3.3.28-5

On license renewal boundary diagram LR-QDC-M-70 (grid location F-4), a segment of piping connected to in-scope piping is not highlighted as being within the scope of license renewal. This segment of piping is part of a piping line that is highlighted as being within the scope of license renewal on either side of the unhighlighted segment, and there are no valves or other pressure boundaries that isolate the unhighlighted segment. It is not apparent to the staff why the unhighlighted segment of piping is not considered to be within scope to ensure that the in-scope portions of the piping line are capable of performing their intended function for license renewal. Therefore, in light of 10 CFR 54.4(a), please provide the basis for not including the unhighlighted piping segment within the scope of license renewal.

RAI 2.3.4.1-1

USAR section 15.6.5.5, contains a discussion on the radiological dose analysis performed for the control room in accordance with guidance of NUREG-0737 Item III.D.3.4. Credit is taken for iodine plateout on surfaces of steam lines and condenser and radioactive decay prior to release. In assessing radioactive releases via the MSIV leakage pathway, MSIV leakage is assumed to pass through three different volumes which provide holdup and plateout. The volumes are the main steam piping section between the inboard and outboard isolation valves, the piping between the outboard isolation valves and the turbine stop valves, and the piping between the turbine stop valves and the turbine condenser complex. The licensee has identified post accident plateout of MSIV seat leakage as a system intended function of the main steam system. The staff believes that in addition to the plateout function, the main steam system also provide for post accident containment and holdup of MSIV bypass leakage, and

that pressure boundary integrity for portions of the main steam system that are required to contain bypass leakage must be maintained during the post accident period. Please clarify whether post accident containment and holdup should be included as an intended function for the main steam system, and if not please provide justification for its exclusion.

RAI 2.3.4.1-2

As stated in RAI 2.3.4.1-1, the staff believes that post accident containment, plateout and holdup of MSIV bypass leakage is a system intended function of the main steam system. Therefore, the SSCs necessary to ensure this intended function, are in scope of license renewal per 10 CFR54.4 (a). Hence, the steam drain lines and turbine bypass piping should be in scope of license renewal and subject to an AMR. License renewal boundary drawings LR-DRE-M-12-2, LR-DRE-M-345-2, LR-QDC-M-13-2, and LR-QDC-M-60-2 indicate that turbine bypass piping from the main steam line equalization header to the condenser, and the main steam piping from the equalization header up to and including the main steam stop valves are not in scope. Please provide a justification for the exclusion of these section of main steam system piping and their associated components.

RAI 2.3.4.1-3

The main steam line drain lines provide a MSIV leakage pathway to the condenser which has an intended function of post accident containment, holdup and plateout of MSIV bypass leakage. Therefore, the main steam drain piping from the main steam line to the condenser is in scope of license renewal per 10 CFR 54.4(a). However, only the Dresden unit 2 boundary drawing shows the entire drain line to the condenser as being in scope of license renewal. Dresden unit 3, and Quad Cities Units 1 & 2, shows only drain line sections on drawings LR-DRE-M-345-2, LR-QDC-M-13-2, and LR-QDC-M-60-2 respectively as being in scope of license renewal. A review of these drawing indicate that the drain lines are continued on Dresden Unit3 drawing M-370, and Quad Cities drawings M-26, and M-73 for Units 1 and 2 respectively. The staff believes that main steam drain line section that goes to the condenser, shown on the above mentioned drawing should be included as in scope of license renewal. Please provide a justification for the exclusion of the main steam drain line piping shown on drawings LR-DRE-M-370, and Quad Cities drawing M-26 and M-73, for which no boundary drawings were provided. Also indicate weather boundary drawing exist for Quad Cities drawings M-26 and M-73 and provide these drawings.

RAI 2.3.4.1-4

Acoustic flow sensing devices, flow elements FE-261-60A, and FE-261-60D on boundary drawing LR-DRE-M-12-1, for Dresden Unit 2, are not shown to be within scope. However, the corresponding devices for the B and C steam lines, flow elements FE-261-60B, and FE-261-60C are included in scope. Please provide justification for the exclusion of these components.

RAI 2.3.4.1-5

The portion of the SRV discharge lines inside the wetwell, and their associated T-quenchers are not identified as in scope in Dresden drawings LR-DRE-M-25, and LR-DRE-M-356. In addition the T-quenchers for Dresden or Quad Cities have not been included in Table 2.3.4-1. The staff

believes that the SRV discharge lines and T-quenchers are in scope of license renewal per 10 CFR 54.4(a)(1). Please provide a justification for exclusion of these components.

RAI 2.3.4.2-1

Section 2.3.4-2 of the LRA lists the intended functions for the feedwater system. The feedwater system interfaces with the primary containment and is safety related for the portion of the system from the reactor vessel to the outermost primary containment isolation valve. Containment isolation is not listed as an intended function. Please provide justification for not including containment isolation as an intended function for the feedwater system.

RAI 2.3.4.2-2

In Dresden Unit 3 drawing LR-DRE-M-347,(E-2) the 3/4" line just inside the outermost check valve shows to be in scope only through valve 3-3299-54, the valve 3-3299-120 and corresponding piping section after the valve is not shown to be in scope. In all other similar piping sections connected to safety related piping the section of piping immediately downstream of the safety related piping is included in scope per 10 CFR 54.4 (a)(2). Please justify the exclusion of this section of piping from the scope for license renewal

RAI 2.3.4.2-3

According to Table 3.1-1 (Reference No. 3.1.1.13), an AMR is not needed for Feedwater and Control Rod drive (CRD) return line nozzles which have been capped. Please explain why the capped section/nozzle of the CRD return line is not in scope since it provides a pressure boundary function. Table 3.1-1, Reference No. 3.1.1.13, references the aging management program, Appendix B.1.6, for these nozzles. In LRA Appendix B.1.6, the applicant states that the Dresden/Quad Cities programs do not provide for the augmented inspections specified in NUREG-0619 for the control rod drive return line nozzles, because the nozzles have been capped. However, Section 8.2 of NUREG-0619 requires various augmented inspections depending on how the capped line was rerouted. Explain how the line was rerouted, and provide the applicable augmented inspection for these pressure boundary nozzles as required by NUREG-0619.

RAI 2.3.4.3-1

In Quad Cities drawing LR-QDC-M-16-5,(D-5), lines 0-33107A and 0-33108A, and valves 0-3399-227A and 0-3399-228A are identified as not in scope for license renewal. These lines connect level switch LS 0-3341-71A, which is shown as in scope, to line 0-3348, which is also shown to be in scope. Please clarify whether these SSCs should be included in scope for license review.

RAI 2.3.4.4-1

In Section 2.3.4.4 of the LRA it is indicated that an expansion joint is fitted between each low-pressure turbine exhaust hood and condenser inlet connection. These expansion joints are not included as a component group requiring AMR in table 2.3.4-4. Please justify the exclusion of the expansion joints from the list of components requiring AMR.

RAI 2.3.4.4-2

In Table 2.3.4-4 the condenser shell is not included as a component group requiring AMR. The staff feels that this component is necessary to support the system intended function, and provides the component intended function of containment holdup and plateout, thus should be included in table 2.3.4-4. Please justify the exclusion of the condenser shell from the list of components requiring AMR.

RAI 2.3.4.6-1

The portion of turbine oil system line 2-2362-2 shown on drawing QDC-M-48-1 (G1) and continued on QDC-M-87-3 (D6) that goes to the unit 2 HPCI oil junction box is not identified as being in scope. The corresponding line to the unit 1 oil junction box is shown as in scope. Please indicate whether this portion of the line should be included in scope and whether drawing QDC-M-87 should be included as a reference to LRA section 2.3.4.6.

RAI 3.3.2.4.5-1

The review of LRA Section 3.3 has resulted in the following RAIs:

- (a) LRA Tables 3.3-1 and 3.3-2 do not identify any aging effects on FP buried piping, fittings and tanks. However, these components are exposed to soil and groundwater environment, and are subject to general, pitting and crevice corrosion, and microbiological influenced corrosion (MIC) that may result in loss of material. Provide justification for not identifying any aging effect/mechanism for these FP SCs.
- (b) LRA Tables 3.3-1, and 3.3-2 do not identify any aging effects on fire hose stations. However, fire hose stations are exposed to a warm and moist environment, and are subject to pitting and corrosion that may result in loss of material. Provide justification for not identifying any aging effect/mechanism for these FP SCs.
- (c) LRA Tables 3.3-1 and 3.3-2 do not identify any aging effects on Halon/CO₂ total flooding fire suppression SCs including nozzles, valves, piping, fittings, tubing, hose stations, and tanks. The line items with reference numbers, 3.3.2.138, 3.3.2.212, and 3.3.2.234 of LRA Table 3.3.2 state that the piping and nozzles components of the CO₂ system do not require an aging management program (AMP), citing a dry gas atmosphere. However, these component types are exposed to a warm and moist environment in the turbine building, and are subject to pitting and corrosion that may result in loss of material. Provide justification for not identifying any aging effect/mechanism for these FP SCs.

RAI B.1.18-1

The review of LRA Appendix B, Section B.1.18 has resulted in the following RAIs:

- (a) The line item with reference number 3.3.2.62 of LRA Table 3.3-2 states that cementitious fire proofing does not require an AMP, because "a non-aggressive,"

vibration free plant indoor environment is not conducive to promoting aging of cementitious fireproofing. However, industry experience, including previous experience at the Dresden Nuclear Power Station, has shown that deterioration of the steel under the coating may cause the cementitious material to become separated from the steel, and in some cases fall off. Provide justification for not having an AMP that will assure its integrity of the cementitious fire proofing.

- (b) LRA Appendix B, Section B.1.18, Fire Protection, states that, "With enhancements the fire protection program is consistent with the ten elements of aging management program XI.M26, "Fire Protection," specified in NUREG-1801 with following exceptions...."

In order for the staff to evaluate the adequacy of the applicant's FP AMP and reach a conclusion that it is consistent with NUREG-1801, the staff requests that the applicant follow the guidelines provided in the NUREG-1801 for FP AMP. NUREG-1801 contains the staff's generic evaluation of the existing plant program and documents the technical basis for the determining where existing programs are adequate without modification and where existing programs should be augmented for the extended period of operation. The frequencies identified in Appendix B, Section B.1.18 exceed those committed to in the applicant's FP program.

Clarify if the plant FP programs include surveillance requirements consistent with regulatory guidelines, and if the activities defined in B.1.18 are in addition to the inspections provided under the FP program.

RAI B.1.19-1

The review of LRA Appendix B, Section B.1.19 has resulted in the following RAI:

LRA Appendix B, Section B.1.19, Fire Water System states that, "With enhancements the fire water system aging management program is consistent with the ten elements of aging management program XI.M27, "Fire Water System," specified in NUREG-1801 with following exceptions...."

In order for the staff to evaluate the adequacy of the applicant's FP AMP and reach a conclusion that it is consistent with NUREG-1801, the staff requests the applicant to follow the guidelines provided in the NUREG-1801 and interim staff guidance for FP AMP [Staff Guidance (ISG)-04, "Aging Management of Fire Protection Systems for License Renewal" (ADAMS Accession # ML022260137, dated December 3, 2002)]. NUREG-1801 contains the staff's generic evaluation of the existing plant programs and documents the technical basis for determining where existing programs are adequate without modification and where existing programs should be augmented for the extended period of operation. Clarify the flow rates and testing frequencies of the underground loop flow tests and describe the plant procedure for this testing.