

October 19, 2004

U.S. Nuclear Regulatory Commission  
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Washington, D.C. 20555-0001

Gentlemen:

In the Matter of	)	Docket Nos. 50-259
Tennessee Valley Authority	)	50-260
		50-296

**BROWNS FERRY NUCLEAR PLANT (BFN) - UNITS 1, 2, AND 3 LICENSE  
RENEWAL APPLICATION - RESPONSE TO NRC REQUEST FOR ADDITIONAL  
INFORMATION (RAI) (TAC NOS. MC1704, MC1705, AND MC1706)**

By letter dated December 31, 2003, the Tennessee Valley Authority (TVA) submitted, for NRC review, an application pursuant to 10 CFR 54, to renew the operating licenses for Browns Ferry Nuclear Plant, Units 1, 2, and 3. As part of its review of TVA's license renewal application, the NRC staff, by letter dated August 31, 2004, identified areas where additional information is needed to complete its review.

The specific areas are from Sections 2.1, 2.2, and 2.3, related to the Scoping and Screening: Mechanical Systems, respectively.

The enclosure to this letter contains the specific NRC requests for additional information and the corresponding TVA response.

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If you have any questions regarding this information, please contact Ken Brune, Browns Ferry License Renewal Project Manager, at (423) 751-8421.

I declare under penalty of perjury that the forgoing is true and correct. Executed on this 19<sup>th</sup> day of October, 2004.

Sincerely,

**Original signed by:**

T. E. Abney  
Manager of Licensing  
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Enclosure:  
cc: See page 3

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Enclosure

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ENCLOSURE

TENNESSEE VALLEY AUTHORITY  
BROWNS FERRY NUCLEAR PLANT (BFN)  
UNITS 1, 2, AND 3  
LICENSE RENEWAL APPLICATION (LRA),

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION (RAI) For  
SCOPING AND SCREENING MECHANICAL SYSTEMS  
SECTIONS 2.1, 2.2, AND 2.3.

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(SEE ATTACHED)

**TENNESSEE VALLEY AUTHORITY  
BROWNS FERRY NUCLEAR PLANT (BFN)  
UNITS 1, 2, AND 3  
LICENSE RENEWAL APPLICATION (LRA),**

**RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION (RAI) FOR  
SCOPING AND SCREENING MECHANICAL SYSTEMS  
SECTIONS 2.1, 2.2, AND 2.3.**

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By letter dated December 31, 2003, the Tennessee Valley Authority (TVA) submitted, for NRC review, an application pursuant to 10 CFR 54, to renew the operating licenses for Browns Ferry Nuclear Plant, Units 1, 2, and 3. As part of its review of TVA's license renewal application, the NRC staff, by letter dated August 31, 2004, identified areas where additional information is needed to complete its review. Listed below are the specific NRC requests for additional information for sections 2.1, 2.2, and 2.3 - Scoping and Screening Results for Mechanical Systems, and the corresponding TVA responses.

**2.3 SCOPING AND SCREENING RESULTS: MECHANICAL SYSTEMS**

**RAI 2.3-1**

Many of the tables in LRA Section 2.3 list "fittings" as a component type subject to an aging management review (AMR). The term fittings typically refers to components such as elbows, tees, unions, reducers, caps, flanges, etc., which are an integral part of piping systems. LRA Section 2.3.5 (page 2.3-127) lists other components which fall under the component type "fittings," but does not list the above components. Confirm that components such as elbows, tees, unions, reducers, caps, flanges, quick disconnects, thermal sleeves, aux heads, drains, and the like are considered as part of the component type "fittings" in the LRA tables, or state if they are considered as part of another listed component type.

**TVA Response to RAI 2.3-1:**

Elbows, tees, unions, reducers, caps, flanges, etc., are not typically shown with UNID's on the boundary drawings so they were not listed in LRA Section 2.3.5. Section 2.3.5 was generated to help identify components that are shown on BFN's boundary drawings with a specific UNID and where these components were included in a commodity. Components such as elbows, tees, unions, reducers, caps, flanges, quick

disconnects, thermal sleeves, aux heads, and drains are included in commodity group fittings.

### **RAI 2.3-2**

Browns Ferry Nuclear Plant (BFNP) LRA Section 2.1.7.9, Group (c) states that "oil, grease, and component filters" are short lived and are periodically replaced. It further states that various plant procedures are used in the replacement of oil, grease, and component filters that are in scope for license renewal. In the process of verifying the results of the above applicant's methodology, the staff raised the following questions.

Because BFNP LRA uses "aging management review" boundary drawings instead of scoping boundary drawings, the components that are in scope but not subject to an AMR are not highlighted on the drawings. Therefore, the staff is unable to determine, for mechanical systems, if all in scope oil, grease, and component filters have been identified in accordance with 10 CFR 54.4. Additionally, the staff cannot determine whether plant procedures exist and are adequate for every in scope "oil, grease, and component filters" that is not subject to an AMR. For example, the cranes system is within the scope of license renewal in accordance with 10 CFR 54.21(a) (2); however, filters are not listed in LRA Table 2.3.3.34 as being subject to an AMR. Additionally, no drawings are provided for this system. Therefore, the staff cannot determine if this system contains any in scope oil, grease, and component filters, and that the procedures are adequate for this system's oil, grease, and component filters.

Because the boundary drawings are generic for all mechanical systems in the BFNP LRA, the following RAI applies to all mechanical systems.

1. Verify that all the in scope oil, grease, and component filters are identified in the license renewal boundary drawings. If not, list those in scope oil, grease, and component filters that are not identified in the drawings.
2. Identify the plant procedures that are used in the replacement of every in scope oil, grease, and filter that is not subject to an AMR to demonstrate that the oil, grease, or filter is replaced on a "periodic basis" and identify the specific period.

3. Identify those in scope oil, grease, and component filters without proper plant procedures that are subject to an AMR.

**TVA Response to RAI 2.3.-2:**

1. The boundary drawings were not intended to depict oil or grease. All filters associated with mechanical systems are not depicted on boundary drawings. The boundary drawings are based on flow diagrams which depict components in the system fluid flow path (i.e., pressure boundary). Even though most discrete components are shown on the flow diagrams, the flow diagrams show various levels of detail associated with vendor supplied skids. For example, some flow diagrams associated with vendor supplied skids show the associated lubricating oil and cooling water components (i.e., filters, pumps, etc.). Other flow diagrams may only depict the major component in the flow path, such as a heat exchanger associated with a vendor supplied chiller package. The refrigerant loop associated with the vendor supplied chiller unit is not depicted on the flow diagram. Vendor drawings and vendor manuals provide details associated with the vendor supplied equipment. In these cases, the vendor documents were utilized to identify components, such as filters, that are subject to aging management review. Examples of filters that were subject to an AMR that were not shown on drawings are: Unit 1 reactor core isolation cooling system lube oil filters; Unit 1 high pressure coolant injection system lube oil filters; and filters associated with the refrigerant loop of heating ventilation and air condition system chillers.
2. Browns Ferry has various maintenance procedures and work orders in place to assure that filters for safety related components are being monitored and replaced as required to assure that equipment will perform its function. Some examples of procedures used to replace the elements are: MPI-0-026-INS002 which is performed annually or 250 hour cumulative inspection, MPI-0-82-INS002 which performs the Standby Diesel Engine 24 month inspection, procedure 0-GI-300-1 Attachment 15.11 which is the Monthly Ventilation Filter Check, repetitive work orders done every 24 weeks, 0-SI-4.8.B.2-1 which is performed weekly, MPI-0-071-TRB001 and repetitive work order every 24 months, and MPI-0-073-TRB001 and repetitive work order every 12 weeks.

Browns Ferry has various preventive maintenance procedures and work orders in place to assure that oil and grease for safety related components are being monitored and replaced as required to assure that equipment will perform its function. The following are examples of procedures that are used for oil and grease replacement: QMDS NUMBER MOV-001 (performed every 54 months), QMDS NUMBER MOV-002 (performed every 54 months), QMDS NUMBER MOV-003 (performed every 54 months), QMDS NUMBER MOT-001 (perform oil samples every six months), QMDS NUMBER MOT-003 (performed at 24 and 36 month intervals), QMDS NUMBER PLN-003 (performed every 3 years), EPI-0-000-MOT-001 (Preventive Maintenance work orders are generated at various frequencies to add grease to motors), EPI-0-000-MOT-002 (Preventive Maintenance work orders are generated at various frequencies to add oil to motors), and MPI-0-000-LUB001 (Preventive Maintenance work orders are generated at various frequencies to add grease to equipment). In addition, some components lubricants are monitored and replaced based on oil analysis (predictive maintenance).

3. Our review did not identify any cases where oil, grease, or in scope filters were without proper plant procedures to exclude them as short lived.

#### **Section 2.3.3.2 Fuel Oil System**

##### **RAI 2.3.3.2-1**

The diesel generator low level radioactive waste (LLRW) fuel oil system and the diesel-driven fire pump LLRW fuel oil system are not highlighted on license renewal drawing 0-47E840-2-LR as being in scope and subject to an AMR. The UFSAR does not describe either of these two subsystems. Therefore, the staff cannot determine if these systems have intended functions that would satisfy any of the criteria in 10 CFR 54.4(a). Provide the design functions and associated licensing basis to prove that these portions of the fuel oil system can be excluded from the scope of license renewal and subject to an AMR.

##### **TVA Response to RAI 2.3.3.2-1:**

The two LLRW fuel oil systems provide fuel to the diesels that drive the pumps that provide the backup water supply for the Ancillary Facilities Fire Protection System. The Ancillary

Facilities Fire Protection System provides water for fire fighting outside the protected area of the plant. The areas protected by the Ancillary Facilities Fire Protection System are not required to shutdown the plant. The Ancillary Facilities Fire Protection System is in accordance with Design Criteria Document BFN-50-761 R4. This is the same System that was asked about in RAI 4.4.1-1

#### **RAI 2.3.3.2-2**

Tank drain valve, 0-DRV-750, and associated piping and fittings are not highlighted on license renewal drawing 0-47E840-2-LR (location F8) as being within the scope of license renewal. Failure of this piping could affect the upstream valve (seismic loadings) and drain the storage tank. The license renewal drawing does not show safety class changes or seismic class changes. Therefore, the staff cannot determine, based on the information provided, whether this portion of piping up to and including valve 0-DRV-750 should be in scope. Justify the exclusion of valve 0-DRV-750 and associated piping and fittings from the scope of license renewal.

#### **TVA Response to RAI 2.3.3.2-2:**

None of the piping shown on drawing 0-47E840-2-LR is safety related or seismic. This piping is in scope for fire protection in accordance with 10 CFR 54.4(a) 3 requirements. Failure of the short section of piping and fittings downstream of valve 0-DRV-703 would not cause the storage tank to drain. Valve 0-DRV-750 is the valve downstream of normally closed valve 0-DRV-703.

#### **Section 2.3.3.3 Residual Heat Removal Service Water System**

##### **RAI 2.3.3.3-1**

License renewal drawing 0-47E851-4-LR provides the drainage flow diagram (identified as System No. 40 in the drawing title block). Most of the piping and valves on the drawing are identified with unique component identifiers (UNIDs) for System 40. However, the piping shown in red does not identify any UNID for the pumps or piping. Identify which components on this license renewal drawing are part of the residual heat removal service water system (System 023).

**TVA Response to RAI 2.3.3.3-1:**

The piping and pumps on drawing 0-47E851-4-LR, marked in red, are associated with the Pumping Station and are part of the RHRSW System (23). The pumps are tagged as RHRSW System 23 components in the plant. There are no UNIDs assigned to pipe. Based on review of physical piping drawings these components are part of the RHRSW System (23) and contained in Table 2.3.3.3 in the Application.

**Section 2.3.3.4 Raw Cooling Water System**

**RAI 2.3.3.4-1**

The shell of water chillers 1A and 1B are not shown as being subject to an AMR on license renewal drawing 1-47E844-2-LR (location E7). Accordingly, heat exchangers are not listed as a component type subject to an AMR in LRA Table 2.3.3.4. However, the shell of these chillers serves as the pressure boundary and structural support for the attached raw cooling water piping which is subject to an AMR. Justify the exclusion of these chillers from being subject to an AMR.

**TVA Response to RAI 2.3.3.4-1:**

DCN 51178A has removed the piping on shell side of the water chillers 1A and 1B to show these chillers abandoned in place on drawing 1-47E844-2-LR. Drawing 1-47E844-2-LR has been revised and being resent to NRC as part of the annual update. Since the raw water piping has been removed, the chillers no longer perform a pressure boundary or structural support function.

**Section 2.3.3.5 Raw Service Water System**

**RAI 2.3.3.5-1**

Normally open, hand-operated butterfly valve 1-25-703 is shown as being subject to an AMR on license renewal drawing 1-47E850-1-LR (location G7). However, the upstream raw service water piping, valves, and interconnected components are not highlighted on this drawing as being within the scope of license renewal and subject to an AMR. Similarly, license renewal drawings 2-47E850-1-LR (location G8) and 3-47E850-1-LR (location H6, H7) contain similar piping and valve arrangements for Units 2 and 3, respectively, where the discharge of raw service water pumps interface with the fire

service system. Provide the basis for using a normally open, hand-operated valve as a boundary from the upstream raw service water system piping and components. Justify the exclusion of these components from the scope of license renewal and being subject to an AMR.

**TVA Response to RAI 2.3.3.5-1:**

The fire protection capability to control and extinguish fires is not dependent on the operability of the Raw Service Pumps, so these pumps are not in scope. Therefore, any piping and valves associated with the RSW System were also not included within the scope of License Renewal. Valve 1-25-703 is the first isolation valve off the 12 inch fire protection header tie-in to the RSW pumps and is "in scope" as it provides an isolatable point between the RSW and FP systems.

**Section 2.3.3.13 Station Drainage System**

**RAI 2.3.3.13-1**

A 3-inch roof drain (roof elevation 667.0 at location D3) is not shown as being within the scope of license renewal and subject to an AMR on license renewal drawing 0-47E851-1-LR. This drain provides a pressure boundary function between the standby gas treatment system and the off gas system, and therefore, should be within the scope of license renewal. Additionally, the drain is passive and long lived, and therefore, should be subject to an AMR. It is noted that the 4-inch roof drains are highlighted as being subject to an AMR at locations B2-B12 of license renewal drawing 0-47E852-3-LR. Justify the exclusion of the 3-inch roof drain from the scope of license renewal and from being subject to an AMR.

**TVA Response to RAI 2.3.3.13-1:**

The 3-inch roof drain on drawing 0-47E851-1-LR should have been colored. It was included as a fitting in the commodity grouping fittings in Table 2.3.3.13 since it provides piping interface with the SGBT System (65) and the Off Gas system (66) in support of release of the filtered SGBT gases through the stack. Drawing 0-47E851-1-LR has been revised to show the 3-inch roof drain colored red and will be resent as part of the annual update.

### **Section 2.3.3.15 Building Heat System**

#### **RAI 2.3.3.15-1**

Note 3 of license renewal drawing 0-47E866-2-LR states that the boundary ends at the reactor building wall. This note is referred to in a number of locations on this drawing (such as locations J1, 2, 4, 5, 7, and 8) where the building heat piping and associated components are not in scope and not subject to an AMR. However, a similar note at valves 1-1029, 1-1030, 2-1318, 2-1319, 3-1386, and 3-1387 (locations I5, 6, 7, 8) is not provided on license renewal drawing 0-47E866-1-LR. These valves are shown as normally open. Thus, the piping on both sides of these valves appear to provide a secondary containment boundary as described in LRA Section 2.3.3.15 and, therefore, should be subject to an AMR. Provide the basis for these valves, which are shown as being subject to an AMR, as being the boundary of piping and components which are not subject to an AMR.

#### **TVA Response to RAI 2.3.3.15-1:**

The valves were colored in error and should not have been included within the boundary. Only the piping and valves located in the reactor building would perform a secondary containment function. Since the valves shown on 0-47E866-1-LR are in the Turbine Building they would not be in scope for Secondary Containment. Drawing 0-47E866-1-LR has been revised to show the boundary ending at the reactor building wall and will be resent as part of the annual update.

### **Section 2.3.3.18 Standby Liquid Control System**

#### **RAI 2.3.3.18-1**

Component electric heater (HTR), located inside the standby liquid control tank, is shown on license renewal drawings 1-47E854-1-LR, 2-47E854-1-LR and 3-47E854-1-LR as being subject to an AMR. LRA Section 2.3.5 lists this component UNID (HTR) in three different component types fittings, heaters, and tanks. Identify which component type in LRA Table 2.3.3.18 includes the electric heater.

#### **TVA Response to RAI 2.3.3.18-1:**

This heater was put in component type fittings in Table 2.3.3.18 and Table 3.3.2.18 in the LRA. Additionally, the

following information should have been included in Tables 2.3.3.18 and 3.3.2.18 of the LRA.

**Table 2.3.3.18 Standby Liquid Control System**

Component type	Intended Function
Strainers	DP

**Table 3.3.2.18: Standby Liquid Control System (063) - Summary of Aging Management Evaluation**

Component Type	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Program	NUREG - 1801 Vol. 2 Item	Table 1 Item	Notes
Strainer	DP	Stainless Steel	Treated Water (internal) Borated	Loss of material due to crevice and pitting corrosion.	Chemistry Control Program (B.2.1.5) One-Time Inspection Program (B.2.1.29)	VII.E2.2-a	None	H, 5, 7

### **Section 2.3.3.20 Emergency Equipment Cooling Water System**

#### **RAI 2.3.3.20-1**

The emergency equipment cooling water system is shown on license renewal drawings 1-47E859-1-LR (at locations C5 and C6), 2-47E859-1-LR (at locations A4 and A7), and 3-47E859-1-LR (at locations A5 and A7). The cooling water return piping from the safety related components terminates at locations designated as "yard drainage." LRA Table 3.3.2.20 states that buried carbon and low alloy steel piping has been evaluated for aging management. 10 CFR 52.21 requires that components subject to an AMR must be identified. However, neither the LRA nor the associated drawings adequately identifies the extent of buried piping subject to an AMR. Identify the extent of buried emergency equipment cooling water piping that is subject to an AMR and provide an appropriately marked license renewal drawing, or identify a specific structure where the piping subject to an AMR terminates. Justify the exclusion of any buried piping or structures between the emergency equipment cooling water system and the final discharge structure from the scope of license renewal and from being subject to an AMR.

#### **TVA Response to RAI 2.3.3.20-1:**

LR note has been added to drawings 1-47E859-1-LR, 2-47E859-1-LR and 3-47E859-1-LR stating that the EECW buried piping is in scope up to the catch basins shown on isometric drawing 0-17W300-9.

### **Section 2.3.3.22 Reactor Building Closed Cooling Water System**

#### **RAI 2.3.3.22-1**

Combination air filter/pressure regulators and flow control valves for the drywell atmospheric cooling (units A5 and B5) are identified on license renewal drawings 2-47E610-70-1-LR and 3-47E610-70-1-LR as being within the scope of license renewal and subject to an AMR. The flow control valves and combination air filter/pressure regulators for the drywell atmospheric cooling units A4 and B4, A3 and B3, A2 and B2, A1 and B1 are not identified as being within the scope of license renewal and subject to an AMR. There is insufficient information in the UFSAR to determine whether the flow control valves and combination air filter/pressure regulators for the drywell atmospheric cooling units listed above can be excluded from the scope of license renewal and from being subject to an AMR. Justify the exclusion of the flow control valves and combination air filter/pressure regulators for the drywell atmospheric cooling units A4 and B4, A3 and B3, A2 and B2, A1 and B1 components from the scope of license renewal and from being subject to an AMR.

#### **TVA Response to RAI 2.3.3.22-1:**

The air filter/pressure regulators for drywell atmospheric cooling units A1 and B1, A2 and B2, A3 and B3, and A4 and B4 do not form a pressure boundary with the control air system as the air filter/pressure regulators for drywell atmospheric cooling units A5 and B5 do. Since these air filter/pressure regulators and flow control valves are not maintaining a pressure boundary for the Control Air System (32) they are not in scope.

#### **RAI 2.3.3.22-2**

Two valves FCV 70-24 and FCV 70-34 are shown on license renewal drawings 2-47E610-70-1 and 3-47E822-1. The operator for these valves is shown on these license renewal drawings as being within the scope of license renewal and subject to an AMR. However, the operator for these same valves is shown as not within the scope of license renewal and subject to an AMR on license renewal drawings 3-47E610-70-1, 1-47E822-1-LR, and 2-47E822-1-LR. Justify the exclusion of the operators for FCV 70-24 and FCV 70-34 from the scope of license renewal and from being subject to an AMR.

**TVA Response to RAI 2.3.3.22-2:**

The operators should have been colored red on drawings 3-47E610-70-1-LR and 2-47E822-1-LR. The modification identified in Appendix F.2 has not been implemented in Unit 1; therefore, these components are not in scope for Unit 1. Drawings 3-47E610-70-1-LR and 2-47E822-1-LR have been revised and are being resubmitted to NRC as part of the annual update.

**RAI 2.3.3.22-3**

The applicant stated that the operators for the dampers are within the scope of license renewal as a pressure boundary for the control air system (System 032). With regard to this statement, the staff has the following additional questions:

- a. The UNIDs assigned to various components, in particular, the dampers and the operators for the dampers, are for System 70 which is the reactor building closed cooling water system. Explain what is meant by the statement, "the operators for the dampers are in scope as a pressure boundary for the control air system (System 032)." Does this statement mean that the operators are evaluated in the control air system? If so, is this statement true for other systems?
- b. Since the operators are highlighted/colored in red on license renewal drawings 2-47E610-70-1-LR and 3-47E610-70-1-LR, does that imply that the operators are subject to an AMR? If so, where in the LRA are the operators listed as components that are subject to an AMR?

**TVA Response to RAI 2.3.3.22-3a:**

The damper operators are part of Closed Cooling Water System (70) and are evaluated as valves in this System. The damper operators support the Control Air System (32) pressure boundary as shown on drawings 2-47E610-70-1-LR, and 3-47E610-70-1-LR. Since these damper operators are connected to the Control Air System they must maintain their pressure boundary in order for the Control Air System (32) to maintain its system boundary (i.e., form a pressure boundary). This statement is true for any damper operators that were required to form a pressure boundary with the Control Air System (32).

**TVA Response to RAI 2.3.3.22-3b:**

The damper operators are evaluated as valves in Table 2.3.3.22 and Table 3.3.2.22.

**Section 2.3.3.27 Fuel Handling and Storage System**

**RAI 2.3.3.27-1**

Section 2.3.3.27 of the LRA states that the portions of the fuel handling and storage system that contain components subject to an AMR are the fuel preparation machines, refueling platform (assembly rails and the main fuel grapple), and the bolting and fasteners associated with the refueling platform and fuel preparation machines. LRA Table 2.3.3.27 lists the components associated with the fuel handling and storage system that are subject to an AMR. However, no drawings are provided for this system. BFNPF UFSAR Table 10.4-1, "Tools and Servicing Equipment," lists fuel servicing equipment, including general purpose grapple, channel transfer grapple, fuel inspection feature and new fuel inspection stand, but none of these are referenced in LRA Section 2.3.3.27. There is insufficient information for the staff to determine whether these components are within the scope of license renewal and subject to an AMR. Identify which of these components are within the scope of license renewal and subject to an AMR.

**TVA Response to RAI 2.3.3.27-1:**

The general purpose grapple, channel transfer grapple, and fuel inspection fixture are in scope but are active components since they change configuration and therefore an AMR is not required. The new fuel inspection stand is not safety related so it does not meet the requirements of a 10 CFR 54.4 (a) (1) component. The new fuel inspection stand also is not required for any of the 10 CFR 54.4 (a) (3) regulated events. The new fuel inspection stand failure would not prevent the accomplishment of a safety related intended function of a safety related component therefore it does not meet the requirement of 10 CFR 54.4 (a) (2).

**Section 2.3.3.28 Diesel Generator System**

**RAI 2.3.3.28-1**

There are two components, i.e., governor and drain pan, in the diesel generator lube oil subsystem that are not subject to an

AMR, as shown in license renewal drawings 0-47E861-5-LR through 0-47E861-8-LR and 3-47E861-5-LR through 3-47E861-8-LR. However, the piping into and out of these components are subject to an AMR, but not the components themselves. Justify the exclusion of these components from the scope of license renewal and from being subject to an AMR.

**TVA Response to RAI 2.3.3.28-1:**

The governor is a controller and is an active component based on components listed in Appendix B of NEI 95-10 Revision 3 and does not require an AMR. The drain pan is not in scope since it performs no 10 CFR 54.4 (a) (1) or 10 CFR 54.4 (a) (3) function. This drip pan would also not be in scope for 10CFR 54.4 (a) (2) since it is not normally fluid filled and does not present a spray hazard. Additionally the piping, valves, and fittings attached to the drip pan were inadvertently colored. Since these components do not perform a 10 CFR 54.4 (a) (1) or 10 CFR 54.4 (a) (3) function. These components would also not be in scope for 10 CFR 54.4 (a) (2) since these components are not normally fluid filled and would not present a spray hazard. Drawings 0-47E861-5-LR through 0-47E861-8-LR and 3-47E861-5-LR through 3-47E861-8-LR have been revised to reflect the piping, valves, and fittings black instead of blue and are being resent to NRC as part of the annual update.

**Section 2.3.3.31 Radiation Monitoring System**

**RAI 2.3.3.31-1**

The following monitors are shown as being subject to an AMR:

- Gas monitors on license renewal drawings 0-47E610-90-2-LR at locations B7, F6, and F8
- Residual heat removal heat exchanger A & C service water discharge radiation monitor on license renewal drawings 1-47E610-90-3-LR, 2-47E610-90-3-LR and 3-47E610-90-3-LR at locations B7 and C7
- Residual heat removal heat exchanger B & D service water discharge radiation monitor on license renewal drawings 1-47E610-90-3-LR, 2-47E610-90-3-LR and 3-47E610-90-3-LR at locations G4 and G5

- Raw cooling water radiation monitor on license drawings 1-47E610-90-3-LR, 2-47E610-90-3-LR and 3-47E610-90-3-LR at location E7
- Reactor building closed cooling water radiation monitor on license renewal drawing 1-47E610-90-3-LR, 2-47E610-90-3-LR and 3-47E610-90-3-LR at location G7. The monitor housing performs a pressure boundary intended function. However, the housing is not listed as a component type subject to an AMR in LRA Table 2.3.3.31. LRA Section 2.3.5 does not include housing as a part of any component group. Clarify if housings are considered to be part of a component group already listed in Table 2.3.3.31.

**TVA Response to RAI 2.3.3.31-1:**

The radiation monitor sample chamber (i.e. housing) are included with component type Fittings in Table 2.3.3.31.

**Section 2.3.3.34 Cranes System**

**RAI 2.3.3.34-1**

LRA Section 2.1.2.2, "Overhead Handling System," refers to cranes, monorails, hoists, and mobile A-frames. However, mobile A-frames are not mentioned in LRA Section 2.3.3.34 or in the UFSAR. LRA Section 2.3.3.34 states that the cranes system includes numerous plant load-handling devices that are used for maintenance of selected plant components. LRA Table 2.3.3.34 lists the components associated with the cranes system that are subject to an AMR.

However, no drawings are provided for this system. There is insufficient information for the staff to determine which cranes are in scope in accordance with 10 CFR 54.4 (a) (2). Indicate which cranes are within the scope of license renewal and subject to an AMR, and whether the mobile A-frames are within the scope of license renewal.

**TVA Response to RAI 2.3.3.34-1:**

The following buildings that contain non-safety related cranes and monorails which could potentially prevent safety related SSCs from performing their intended function(s) are: Reactor Building, Primary Containment, Diesel Generator Buildings, Intake Pumping Station, and Reinforced Concrete Chimney. All cranes and monorails in these buildings are in scope. The

Mobile A-frames is a crane on wheels. The A-frame cranes are in scope since they could be used in a safety related building. This crane is subject to an AMR.

#### **Section 2.3.4.4 Heater Drains and Vents System**

##### **RAI 2.3.4.4-1**

Pressure reducing valves PCV-1-151, 153, 166, and 167 are highlighted as being subject to an AMR on license renewal drawing 2-47E801-2-LR (location B-3, B-4). However, the piping downstream of these pressure reducing valves is not within the scope of license renewal. Likewise, a similar arrangement for Unit 3 is shown on license renewal drawing 3-47E801-2-LR (location B-3, B-4). Pressure reducing valves typically do not provide isolation capability if the downstream piping was to fail. Failure of the downstream piping could affect the intended function of the heater drains and vents system that is required to establish the main steam isolation valve (MSIV) leakage pathway to the condenser per LRA Section 2.3.4.4. Therefore, the piping downstream should be in scope in accordance with 10 CFR 54.4 (a) (2). Justify the exclusion of the piping downstream of valves PCV-1-151, 153, 166, and 167 from being within the scope of license renewal and subject to an AMR.

##### **TVA Response to RAI 2.3.4.4-1:**

Calculation issued in support of the MSIV leakage path has these valves listed as a boundary. These valves close on loss of power, loss of air, or low steam line pressure. TVA will review the qualification of the MSIV leakage path to identify the piping, supports and other components past the isolation valve required to maintain the structural integrity of the MSIV leakage path. Identified piping, supports or other components will be added to the scope as needed.

##### **RAI 2.3.4.4-2**

Check valves 742 and 744 are highlighted on license renewal drawing 2-47E801-2-LR (location C2) as being subject to an AMR. However, the piping downstream of these check valves are not within the scope of license renewal. Likewise, a similar arrangement for BFNP Unit 3 is shown on license renewal drawing 3-47E801-2-LR (location C2). Failure of the downstream piping would affect the intended function of the heater drains and vents system that is required to establish

MSIV leakage pathway to the condenser per LRA Section 2.3.4.4 and therefore should be in scope in accordance with 10 CFR 54.4(a)(2). Furthermore, the check valve orientation as shown on these drawings will not prevent flow to the downstream piping in the event of a failure. Justify the exclusion of the piping downstream of check valves 742 and 744 from being within the scope of license renewal and subject to an AMR.

**TVA Response to RAI 2.3.4.4-2:**

Calculation issued in support of the MSIV leakage path has these valves listed as a boundary. TVA will review the qualification of the MSIV leakage path to identify the piping, supports and other components past the isolation valve required to maintain the structural integrity of the MSIV leakage path. Identified piping, supports or other components will be added to the scope as needed.

**Section 2.3.4.6 Condenser Circulating Water System**

**RAI 2.3.4.6-1**

LRA Section 2.3.4.6 states that the condenser circulating water (CCW) system includes a loop in the discharge conduit containing a vacuum breaker valve. The valve prevents the backflow of heated water from the cooling tower warm water channel into the intake channel (fore-bay) that serves as an ultimate heat sink intended function. If the level in the warm water channel exceeds that in the fore-bay, backflow could occur upon loss of offsite power with a subsequent trip of the CCW pumps. LRA Section 2.3.4.6 also states that the condenser circulating water system contains components that are within the scope of license renewal in accordance with both 10 CFR 54.4(a)(1) and 10 CFR 54.4 (a) (2), and that the components subject to an AMR extend in the discharge vacuum breaking piping from the discharge conduit to an atmospheric vent. Additionally, UFSAR Section 11.6.4 states that "a vacuum breaking system with remote manual control to break vacuum on the vacuum loop is a redundant seismic Class 1 engineered safeguard." The above mentioned portion of the CCW system for Unit 1 are highlighted entirely in red (i.e., within the scope of license renewal in accordance with 10 CFR 54.4 (a) (1)) on license renewal drawing 1-47E831-3. However, the corresponding portions of the CCW system for Unit 2 are partially highlighted in blue (i.e., within the scope of license renewal in accordance with 10 CFR 54.4 (a) (2)) and partially highlighted in black (i.e., not in scope) on license

renewal drawings 2-47E831-3. The corresponding portions of the CCW system for Unit 3 are highlighted on drawing 3-47E831-3 the same way as for Unit 2. Justify why the portion of the CCW system in the vacuum breaking piping from the discharge conduit to the atmospheric vent has been highlighted differently for Units 2 and 3 than for Unit 1, and explain why the vacuum breaker valves, but not the associated 12-inch piping and fittings in the vacuum loop in the Unit 2 and 3 systems, are considered within scope in accordance with 10 CFR 54.4 (a) (1).

**TVA Response to RAI 2.3.4.6-1:**

DCN 51360A was issued to reclassify all three units' piping to non-safety related. Implementation of DCN was completed on Units 2 & 3 at the time of submittal so their piping was colored blue for 10 CFR 54.4 (a) (2). Since Unit 1 portion of the DCN was not implemented its piping was colored red for 10 CFR 54.4 (a) (1). The black portion of the 12 inch vent pipes on the Unit 2& 3 drawings were inadvertently not colored but should have been colored blue. DCN 51360A has now been completed on Unit 1 so the Unit 1 drawing 1-47E831-1-LR was revised to be shown as the Units 2 and 3 drawings. Drawings 1-47E831-3-LR, 2-47E831-3-LR, and 3-47E831-3-LR have been revised and will be re-sent as part of the annual update.

**RAI 2.3.4.6-2**

LRA Table 2.3.4.6 lists piping, valves, fittings, and bolting as some of the component types that are subject to an AMR. However, the only intended function listed for these component types is structural support (bolting has the additional intended function of mechanical closure). For the vacuum breaking system to perform its intended function when required, it would appear that the pressure boundary of the vacuum breaking loop, from the discharge conduit to the atmospheric vent, would need to remain intact. Therefore, the vacuum breaker valve bodies and associated 12-inch piping, fittings, and bolting which the vacuum breaking loop comprises should have the intended function of pressure boundary. Justify why the intended function of pressure boundary is not included in LRA Table 2.3.4.6 for the above mentioned components.

**TVA Response to RAI 2.3.4.6-2:**

The above listed components are not required to maintain a pressure boundary. If these components loose there pressure boundary function and start to leak water the valves would still be able to perform the vacuum breaking function. The intended function of this system does not maintain system pressure boundary.