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March 7, 2006

10 CFR 54

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 (LRA) - SUPPLEMENTAL INFORMATION FOR OPEN ITEM 2.4-3 (TAC NOS. MC1704, MC1705, AND MC1706)

By letter dated December 31, 2003, TVA submitted, for NRC review, an application pursuant to 10 CFR 54, to renew the operating licenses for the Browns Ferry Nuclear Plant, Units 1, 2, and 3. As part of its review of TVA's LRA, the NRC staff, through an informal request on March 1, 2006, requested supplemental information for Open Item 2.4-3.

The enclosure to this letter provides responses to the requests for the requested supplemental information for Open Item 2.4-3.

A105

There are no new regulatory commitments associated with this submittal. If you have any questions concerning this letter, please contact William D. Crouch at (256) 729-2636.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 8th day of March, 2006.

Sincerely,

Brian O'Grady

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cc: See page 3

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ENCLOSURE

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

SUPPLEMENTAL INFORMATION FOR OPEN ITEM 2.4-3

(SEE ATTACHED)

TENNESSEE VALLEY AUTHORITY

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

SUPPLEMENTAL INFORMATION FOR OPEN ITEM 2.4-3

By letter dated December 31, 2003, TVA submitted, for NRC review, an application pursuant to 10 CFR 54, to renew the operating licenses for the Browns Ferry Nuclear Plant, Units 1, 2, and 3. As part of its review of TVA's LRA, the NRC staff, through an informal request on March 1, 2006, requested supplemental information for Open Item 2.4-3.

This enclosure contains the specific NRC requests for supplemental information and the corresponding TVA responses.

NRC Request 1

Per TVA letter dated November 16, 2005, TVA stated that it will perform a one-time confirmatory ultrasonic thickness measurements on a portion of the cylindrical section of the drywell in a region where the liner plate is 0.75 inches thick. TVA is requested to justify its proposed use of "one-time confirmatory ultrasonic inspection" versus use of a periodic aging management program containing the ultrasonic inspection, frequency of inspection and criteria for evaluating the ultrasonic measurement results elements. The staff has a concern that a one-time confirmatory inspection program, even with acceptable measuring results, may not be able to assure continued drywell shell integrity for the entire extended period of operation.

TVA Response to NRC Request 1

Past inspections of the Drywell Shell in the sand bed region and immediately below the drywell head flange indicated that the condition of the drywell steel liner plate is good.

In response to NRC Generic Letter 87-05, which addressed the potential for corrosion of boiling water reactor (BWR) Mark I steel drywells in the "sand pocket region", TVA provided the NRC with the results of the ultrasonic testing (UT) for potential corrosion degradation of drywell liner plate, on August 30, 1988. The results of the ultrasonic testing states: Each unit's drywell was ultrasonically tested near the sand cushion area during 1987. The results from these tests showed that the nominal thickness was maintained on each drywell. Paragraph IWE-1242 of ASME Section XI requires

the Owner to determine containment surface areas requiring augmented examination, in accordance with paragraph IWE-1241. These areas must be identified in the Owner's inspection program. Paragraph IWE-1241 states, "surface areas likely to experience accelerated degradation and aging require the augmented examinations identified in Table IWE 2500-1, Examination Category E-C". UT thickness measurements in the sand pocket region, in accordance with IWE-2500 (c)(2), (c)(3), and (c)(4), were obtained during the U3C8 (1998) and U2C10 (1999) refueling outages for Unit's 3 and 2, respectively. The data indicated that the condition of the drywell steel liner plate in this area was good, and that this area should not be categorized for augmented examination per IWE.

For BFN Unit 1, UT thickness measurements in the sand pocket region were performed in 1999 and 2002. The data indicated that the drywell steel liner plate in this region exhibited no measurable reduction in wall thickness, and met all applicable acceptance criteria.

Additionally, the drywell area immediately below the drywell head flange (upper vertical section of the drywell) was also considered as an area potentially requiring augmented examination in accordance with paragraph IWE-1241 for Units 2 and 3. This area is exposed to standing water and repeated wetting and drying during refueling operations. UT thickness measurements were taken in the above selected areas from the inside surface in accordance with IWE-2500 (c)(2), (c)(3), and (c)(4), during U3C9 (2000) and U2C11 (2001) refueling outages. The data indicated that the condition of the drywell steel liner plate in this area is good, and that this area should not be categorized for augmented examination.

For a summary of inspections and results of the Unit 2 and Unit 3 containment for the years 1998 through 2004, see the response to Follow-up to RAI 3.5-4.

As discussed in the November 16, 2005, letter, TVA has committed to ultrasonic thickness measurements on the vertical cylindrical area immediately below the drywell flange on Unit 1.

The operating experience history of BFN is not consistent with the operating experience or events that have occurred at Oyster Creek and Dresden Unit 3 which resulted in corrosion of inaccessible portions of the containment shell.

A one-time confirmatory inspection is appropriate because previous inspections have not identified any aging effects which would warrant the implementation of an additional periodic aging management program. The one-time confirmatory inspections of Units 2 and 3 on the cylindrical section of the drywell where the liner plate is 0.75 inches thick will provide additional assurance that corrosion of the Drywell Shell is not a significant aging effect. The Unit 2 and Unit 3 inspections are considered to bound Unit 1 since these units have had significantly more refueling outages. Additionally, BFN is committed to the requirements of ASME Section XI, Subsection IWE, which is the AMP for the BFN steel containment during the period of extended operation. All UT examination data resulting from IWE inspections are required to meet the acceptance criteria for the containment shell wall thickness. Any data that does not meet the acceptance criteria shall be documented by the site corrective action program and evaluated by Site Engineering for disposition. The IWE program in conjunction with the additional confirmatory inspections will provide assurance that the required wall thickness of Drywell Shell is maintained through the period of extended operation.

NRC Request 2

TVA stated that the BFN configuration of the refueling cavity to drywell seal is different from that of a number of other Mark I containments including the facts that there is no gasket at the drain, and the leakage from the refueling seal can be monitored. Please provide pertinent sketches to explain the above stated differences in seal configurations between BFN and other Mark I plants cited above and explain how the leakage of refueling seal is monitored as well as the reliability of the monitoring set up.

TVA Response to NRC Request 2

A sketch of the BFN configuration of the refueling cavity to drywell seal is provided in Figure 1 of this enclosure.

The BFN configuration was compared to the Oyster Creek drywell to cavity seal configuration which contained a 2" drain line which uses a gasket. As shown in Figure 1, the BFN configuration for the 2" drain line does not use a gasket. For BFN, this 2" drain line is welded to the plate. Using a weld connection eliminates the concern of gasket degradation which could result in water leakage during refueling operations. Also, as can be seen in Figure 1, any

leakage from the Drywell to Reactor Well Seal (Outer Bellows), which is Item 8 in the figure, will go directly to the Drywell to Reactor Well Seal Rupture Drain and not to the inaccessible area of the drywell shell.

BFN does not monitor the leakage which is attributable to only the refueling seal. As stated in TVA's Response to Follow Up to RAI 2.4-3 contained in a May 31, 2005, letter, "A postulated failure of the drywell-to-reactor building refueling seal can result in water intrusion into the annulus space around the drywell. This leakage can occur only during refueling outages when the reactor cavity is flooded to allow movement of fuel between the reactor and the fuel pool. However, water intrusion does not cause failure of the drywell's intended function. Any water leakage resulting from a postulated failure of the drywell-to-reactor building refueling seal could not remain suspended in the annulus region for an indefinite period of time and would eventually be routed to the sandpocket area drains or would evaporate due to the heat generated in the drywell during operation." Additionally, as stated in TVA's Response to Follow Up to RAI 2.4-3, BFN inspects the areas where the sand pocket drains are located during routine operator rounds and takes corrective actions based on inspection results. The inspection in the Reactor Building areas is to verify that no oil or abnormal water leakage is present.

NRC Request 3

Regarding the walkdown performed in April 1998 at Unit 3's refueling seal area near the dry well flange (refer to TVA letter dated May 31, 2005), it was reported by TVA that standing water was observed. Please discuss the specific areas affected with the aid of sketches depicting the circumstances and the specific remedial action(s) taken. Also confirm if similar standing water experience was observed for Units 2 and 3 (Should be Units 1 and 2).

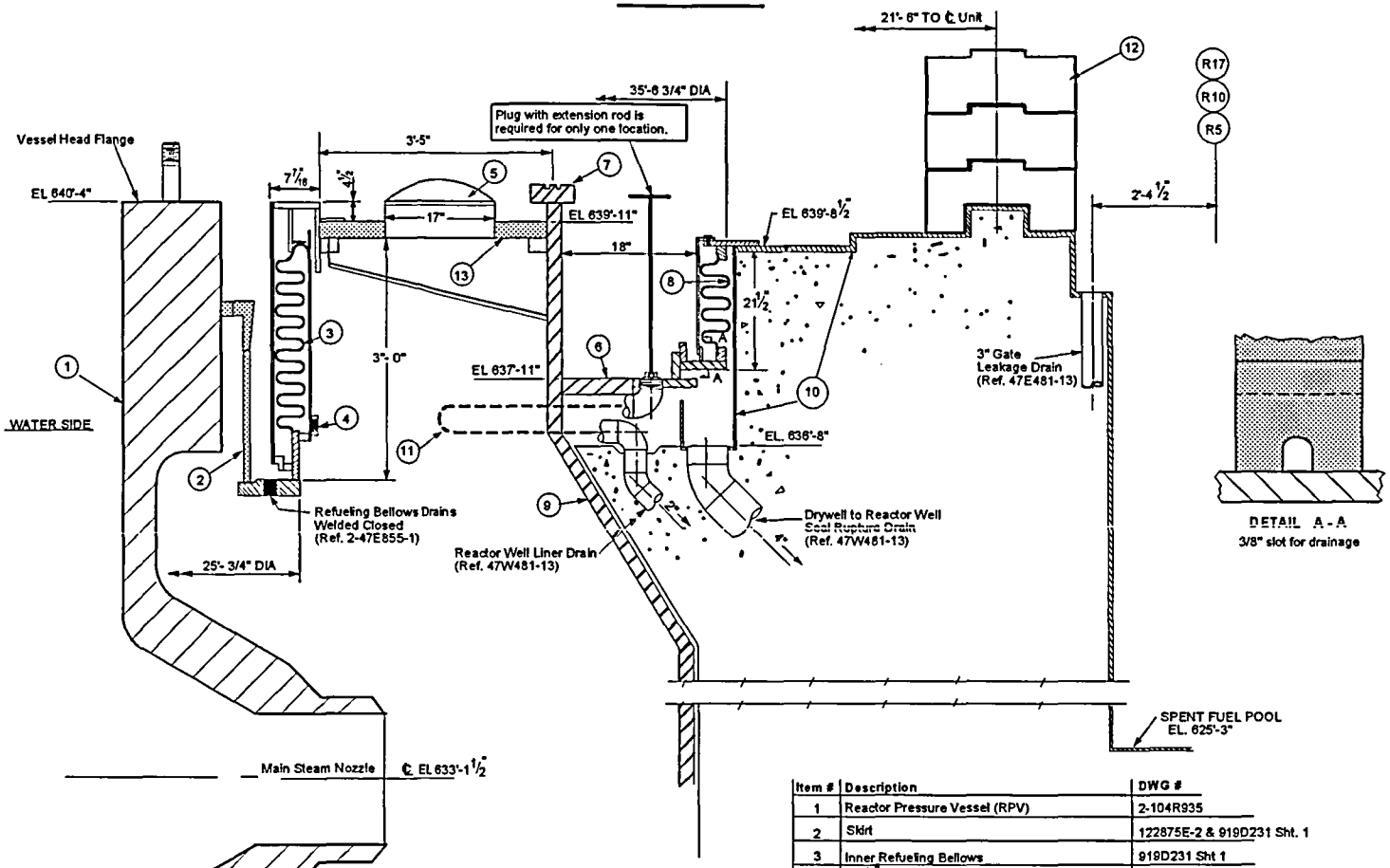
TVA Response to NRC Request 3

Referring to Figure 1, the standing water was located between the outside of the Drywell Shell (Item 9) and the Outer Bellows (Item 8) above the Drywell Seal Support Flange (Item 6) at Elevation 637'-11". This area is routinely flooded for shielding and contamination control during refueling operations. After refueling operations are completed, water may be left in this refueling seal area for shielding. As stated in the May 31, 2005, letter, this area is exposed to standing water and repeated wetting and drying during

refueling operations. The area is not accessible for detailed visual examination from the outside surface.

UT thickness measurements were taken from the inside surface of the drywell shell on Unit 3 during U3C9 (4/10/00) and Unit 2 during U2C11 (4/1/01). The inspection details and results are discussed in the May 31, 2005, letter. These inspections address the concern of exposure to standing water and repeated wetting and drying during refueling operations as well as well the as standing water observed during the April, 1998, Unit 3 mid-cycle outage. Referring to Figure 1, the UT thickness measurements were of the vertical cylindrical portion of the Drywell Shell (Item 9) between Elevation 637'-4" (the start of the vertical cylinder portion of the shell) and the Bulkhead Plate (Item 13). For Unit 1, this area will be inspected prior to restart. This inspection is discussed in TVA's response to Open Item 2.4-3 provided in a letter dated November 16, 2005.

FIGURE 1



Item #	Description	DWG #
1	Reactor Pressure Vessel (RPV)	2-104R935
2	Skirt	122875E-2 & 919D231 Sht. 1
3	Inner Refueling Bellows	919D231 Sht 1
4	1 1/2 NPT TEST PLUG	919D231 Sht 1
5	Hatchway	48N449
6	Drywell Seal Support Flange	919D612 Sht. 1 & 2
7	Drywell Head Flange	PDM-11
8	Drywell To Reactor Well Seal (Outter Bellows)	919D612 Sht. 1 & 2
9	Drywell Liner Plate	PDM E66
10	Reactor Well Liner Plate	919D612 Sht. 2
11	Drywell To Reactor Well Seal Drain Expansion Loop	47W481-13
12	Removable Concrete Blocks	
13	Bulkhead Plate - 1 1/2" thick	919D231 Sht. 1