September 24, 2008

Mr. William R. Campbell, Jr.
Chief Nuclear Officer and
Executive Vice President
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNIT 3 - RELIEF REQUEST ASSOCIATED WITH THIRD 10-YEAR INTERVAL INSERVICE INSPECTION EXAMINATION REQUIREMENTS (TAC NO. MD6749) (3-ISI-23)

Dear Mr. Campbell:

By a letter dated August 24, 2007, as supplemented by a letter dated April 9, 2008, the Tennessee Valley Authority (TVA, the licensee) submitted Relief Request (RR) 3-ISI-23. This submittal requested relief from the American Society of Mechanical Engineers (ASME) Code, Section XI, Table IWB-2500-1, Examination Category B-D, Item Nos. B3.90 and B3.100 and ASME Code Case N-648-1 Alternative Requirements for Inner Radius Examination of Class 1 Reactor Vessels, Section XI, Division 1 requirements based on it being impractical to perform the required examinations. In accordance with Title 10 of the Code of Federal Regulations (10 CFR) Section 50.55a(g)(5)(iii), the request proposes the use of an alternative. More specifically, TVA has proposed the use of ultrasonic testing or visual testing with enhanced magnification as prescribed in the 2001 Edition of the ASME Boiler and Pressure Vessel Code, Section XI.

Based on our review of your submittals, the NRC has concluded that the method of record is impractical; however, the NRC staff finds that the alternative inspection proposed provides reasonable assurance of structural integrity. Therefore, the NRC finds that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law and will not endanger life of property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

This relief is granted and the alternate proposed by TVA is authorized for the remainder of the third 10-year inservice inspection interval at Browns Ferry Unit 3, which began November 19, 2005, and ends November 18, 2015.

Sincerely,

/RA/

Thomas H. Boyce, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-296

Enclosure: Safety Evaluation

cc w/encl: See next page

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ADAMS ACCESSION NUMBER: ML082480573 NRR-028

OFFICE	LPL2-2/PM	LPL2-2/LA	CVIB/BC	OGC	LPL2-2/BC
NAME	EBrown	BClayton	MMitchell by memo	BMizuno	TBoyce
DATE	09/22/08	09/22/08	8/13/08	09/16/08	09/24/08

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Letter to William R. Campbell, Jr., from Eva A. Brown dated: September 24, 2008

SUBJECT: BROWNS FERRY NUCLEAR PLANT, UNIT 3 - RELIEF REQUEST ASSOCIATED WITH THIRD 10-YEAR INTERVAL INSERVICE INSPECTION EXAMINATION REQUIREMENTS (TAC NO. MD6749) (3-ISI-23)

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

INSERVICE INSPECTION PROGRAM

RELIEF REQUEST NO. 3-ISI-23

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNIT 3

DOCKET NO. 50-296

1.0 INTRODUCTION

By a letter dated August 24, 2007, as supplemented by a letter dated April 9, 2008, the Tennessee Valley Authority (TVA, the licensee) submitted Relief Request (RR) 3-ISI-23. This submittal requested relief from the American Society of Mechanical Engineers Boiler and Pressure Vessel (ASME) Code, Section XI, Table IWB-2500-1, Examination Category B-D, Item Nos. B3.90 and B3.100 and ASME Code Case N-648-1 Alternative Requirements for Inner Radius Examination of Class 1 Reactor Vessels, Section XI, Division 1 requirements based on the impracticality of performing the ASME Code required examinations. In accordance with Title 10 of the Code of Federal Regulations (10 CFR) Section 50.55a(g)(5)(iii), the request proposes an alternative to use ultrasonic testing or visual testing with enhanced magnification in lieu of the ASME Code requirement.

Relief is granted and the alternative purposed by TVA is authorized for the third 10-year inservice inspection (ISI) interval at Browns Ferry Unit 3, began on November 19, 2005, and ends November 18, 2015.

2.0 REGULATORY REQUIREMENTS

Inservice inspection of the ASME Code Class 1, 2, and 3 components is performed in accordance with Section XI of the ASME Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific relief has been granted by the Nuclear Regulatory Commission (NRC) pursuant to 10 CFR 50.55a(g)(6)(i). Section 50.55a(g)(6)(i) of 10 CFR Part 50 states that the Commission will evaluate determinations under paragraph (g)(5) that ASME Code requirements are impractical. In accordance with 10 CFR 50.55a(a)(3) alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if, (i) the proposed alternatives would provide an acceptable level of quality and safety or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design,

geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein.

ASME Code Case N-648-1 Alternative Requirements for Inner Radius Examination of Class 1 Reactor Vessel Nozzles, Section XI, Division 1 allows a licensee to perform an enhanced VT-1 (EVT-1) visual examination of the inner radius of the reactor pressure vessel (RPV) nozzles in lieu of a volumetric examination as required by the ASME Code, Section XI, Table IWB-2500-1, Examination Category B-D, Item No. B3.100.

ASME Code, Section XI, Table IWB-2500-1, Category B-D, Item B3.90 requires a volumetric examination of essentially 100 percent of the RPV nozzle-to-vessel welds and adjacent base material as depicted in ASME Code, Section XI, Figure IWB-2500-7(a).

ASME Code, Section XI, Table IWB-2500-1, Category B-D, Item B3.100 requires a volumetric examination of essentially 100 percent of the RPV nozzle inner radius (IR) as depicted in ASME Code, Section XI, Figure IWB-2500-7(a).

ASME Code Case N-460, Alternative Examination Coverage for Class 1 and Class 2 Welds, clarifies the phrase “essentially 100 percent” as greater than 90 percent coverage of the examination volume, or surface area, as applicable. ASME Code Case N-460 has been approved for use by the NRC in Regulatory Guide 1.147, Revision 14, Inservice Inspection Code Case Acceptability (RG 1.147).

ASME Code Case N-648-1 was approved for general use in RG 1.147, Revision 14 with conditions: In place of an ultrasonic examination, licensees may perform a visual examination with enhanced magnification that has a resolution sensitivity sufficient to detect a one-mil width wire or crack, utilizing the allowable flaw length criteria of Table IWB-3512-1 with limiting assumptions on the flaw aspect ratio. The provisions of Table IWB-2500-1, Examination Category B-D continue to apply except that, in place of examination volumes, the surfaces to be examined are the external surfaces shown in the figures applicable to this table (the surface is from point M to point N in the ASME Code, Section XI, Figures IWB-2500-7(a) through (d)).

It should be noted that since the licensee has invoked ASME Code Case N-648-1, which has been approved for general use in RG 1.147, Revision 14 and contained in 10 CFR 50.55a(a)(3)(b) as an approved alternative examination, ASME Code Case N-648-1 becomes part of the licensee’s ASME Code of record and relief can be granted for nondestructive examinations obtaining less than essentially 100 percent coverage

The ASME Code of record for the third 10-year interval ISI program is the 2001 Edition with no Addenda of Section XI of the ASME Code.

3.0 RELIEF REQUEST NO. 3-ISI-23

3.1 Component Function/Description

Table 1
Reactor Pressure Vessel (RPV) Nozzle-to-Vessel Welds Examination Results

Weld Number	Nozzle Type	Nozzle Size Outside Diameter (OD)	Weld Volumetric Examination Coverage Results
N1A Nozzle-to-Vessel (N/V) Weld	Recirculation Outlet	28 Inches	22 percent
N2B N/V Weld	Recirculation Inlet	12 Inches	42 percent
N2D N/V Weld	Recirculation Inlet	12 Inches	42 percent
N2F N/V Weld	Recirculation Inlet	12 Inches	42 percent
N3B N/V Weld	Main Steam	26 Inches	36 percent
N4B N/V Weld	Feed Water	12 Inches	39 percent
N4C N/V Weld	Feed Water	12 Inches	39 percent
N5A N/V Weld	Core Spray	10 Inches	38 percent
N8A N/V Weld	Jet Pump Recirculation Instrumentation	4 Inches	64 percent

Table 2
RPV Nozzle Inner Radius Section Enhanced Visual Examination (EVT-1) Results

Weld Number	Nozzle Type	Nozzle Size Outside Diameter (OD) Inches	EVT-1 of Nozzle Inner Radius (IR) Surface Area Results
N1A Nozzle IR	Recirculation Outlet	28 Inches	90 percent
N2B Nozzle IR	Recirculation Inlet	12 Inches	40 percent
N2D Nozzle IR	Recirculation Inlet	12 Inches	40 percent
N2F Nozzle IR	Recirculation Inlet	12 Inches	40 percent
N3B Nozzle IR	Main Steam	26 Inches	90 percent
N5A Nozzle IR	Core Spray	10 Inches	40 percent
N8A Nozzle IR	Jet Pump Recirculation Instrumentation	4 Inches	40 percent

3.2 Code Requirements for Which Relief is Requested

ASME Code, Section XI, Table IWB-2500-1, Category B-D, Item B3.90

ASME Code, Section XI, Table IWB-2500-1, Category B-D, Item B3.100

ASME Code Case N-460

ASME Code Case N-648-1

3.3 Licensee's Proposed Alternative (As Stated)

> In lieu of the [ASME] Code requirement for essentially 100 percent [volumetric] UT examination on the [identified] nozzle-to-vessel [welds,] TVA proposes a [volumetric] UT examination of accessible areas to the maximum extent practical given the component design and configuration of the RPV nozzle-to-vessel welds.
>
> For the [identified] RPV [nozzle] inner radius [sections,] a visual examination with enhanced magnification that has a resolution sensitivity to detect a 1-mil width wire or crack, utilizing the allowable flaw length criteria of [ASME Code, Section XI,] Table IWB-3512-1 with limiting assumptions on the flaw aspect ratio was performed [in accordance with ASME Code Case N-648-1, in lieu of a UT examination].
>
> The provisions of the 2001 Edition [of the ASME Code,] in accordance with 10 CFR 50.55a(b)(2)(xxiv), as amended by Sections 10 CFR 50.55a(b)(2)(xv)(B) through 10 CFR 50.55a(b)(2)(xv)(G) and 10 CFR 50.55a(b)(2)(xvi)(A), of [Section XI,] Table IWB-2500-1, Examination Category B-D continue to apply except that, in place of examination volumes, the surfaces to be examined are the [inner radius surface area M-N] shown in the figures applicable to this table.

3.4 Licensee's Bases for Alternative (As Stated)

> The design configuration of the RPV nozzle-to-vessel welds precludes an [ultrasonic (UT)] examination of essentially 100 percent of the required volume. The component design configuration limits UT examination coverage of the welds to the percentages shown in Table 1.[1]
>
> Visual examination of the inner radius section for the above nozzles is limited because the reactor internal piping configuration prevents placement of the camera in all positions necessary to examine the surface M-N (See [ASME Code Section XI,] Figures IWB-2500-7(a) through (d)) over the full circumference. This prevents the examination from obtaining essentially 100 percent coverage.
>
> A detailed description of the examination limitations is provided below:
>
> **[N1A Recirculation Outlet and N3B Main Steam Outlet Nozzle Inner Radius]**
>
> There are no thermal sleeves or piping inside the nozzles [and] they are of sufficient size to perform visual examination on the majority of the nozzle bore region. However, to

1. Table 1 referenced here can be found in the licensee's submittal dated August 24, 2007.

achieve enhanced visual examination criteria, the underwater camera would need to be placed inside the nozzle opening and using [a] conventional underwater camera and fixtures, it is not possible to maintain [the] required camera angle to fully examine the inner most portion of the nozzle bore. Therefore, for the examination of the recirculation outlets (N1 nozzles) and the main steam [outlets] (N3 nozzles), less than [essentially] 100 percent examination volume was achieved. The estimated examination coverage for these nozzles was 90 percent of the required volume.

[N2B, N2D, and N2F Recirculation Inlet and Jet Pump Riser Piping Nozzle Inner Radius]

The inaccessible area is the inside bend radius of [the] elbow at approximate clock positions 11:00 to 1:00, and at the bottom outside diameter bend of the elbow at approximate clock positions 5:00 to 7:00. The limitations are due to the proximity of the jet pump risers.

[N5A Core Spray Nozzle Inner Radius]

Core spray thermal sleeve and tee box and feedwater sparger (sic). Feedwater spargers are located above the core spray nozzle and the configuration of the core spray thermal sleeve and tee box prohibits placement of the camera 360 degrees around the nozzle. The limitations are at the top position at approximate clock positions 10:00 to 2:00, and the bottom position at approximate clock positions 4:00 to 8:00.

[N8A Jet Pump Recirculation Instrumentation Nozzle Inner Radius]

Twelve instrumentation lines pass through the vessel wall into the vessel (sic). The core shroud support plate is located directly beneath the [N8A] nozzle preventing placement of the camera from approximate clock positions 4:00 to 8:00.

3.5 Licensee's Justification for Relief (As Stated)

(1) The design configuration of the subject nozzle-to-vessel welds precludes UT examination of essentially 100 percent of the required examination volume. Access to the nozzle-to-vessel welds is by a series of doorways in the concrete biological shield wall. Insulation behind these doorways is designed for removal around the nozzle circumference. In order to examine the welds in accordance with the [ASME] Code requirements, the RPV would require extensive design modifications. The physical arrangements of the nozzle-to-vessel welds preclude UT examination from the nozzle side. The limitations are inherent to the barrel-type nozzle-to-vessel weld design and are compounded by the close proximity of the biological shield wall.

(2) Scanning from the nozzle surface is ineffective due to the weld location and the asymmetrical inside surface where the nozzle and vessel converge. Coverage was increased by scanning from the outside blend radius of the welds where practical. Experience from the automated UT examinations performed at other BWRs [boiling water reactors] from the inside surface has shown that the nozzle-to-vessel weld coverage would not be greatly improved, even if performed from the inside surface utilizing the current state-of-the-art techniques.

The extent of examination coverage from the vessel side provides reasonable assurance that no flaws oriented parallel to the weld are present. The [volumes]

receiving little or no examination coverage are located toward the outside surface of the reactor vessel in the general area of the nozzle outside blend radius. [The reactor vessel inner-half of the thickness and inside surface are interrogated with the UT beam. Degradation located at the inside surface or inner-half of the vessel would be located.]

The subject welds were examined with the latest ultrasonic techniques, procedures, equipment, and personnel qualified to the requirements of the Performance Demonstration Initiative (PDI) Program, in accordance with the requirements of the 2001 Edition, in accordance with 10 CFR 50.55a(b)(2)(xxiv), as amended by Sections 10 CFR 50.55a(b)(2)(xv)(B) through 10 CFR 50.55a(b)(2)(xv)(G) and 10 CFR 50.55a(b)(2)(xvi)(A), by following the Electric Power Research Institute's (EPRI) PDI processes.

(3) Radiographic examination [RT] as an alternate volumetric examination method was determined to be impractical due the radiological concerns. Gaining access to the inside surface of the RPV to place RT film would require extensive personnel protection due to high radiation and contamination levels. Also, due to the varying thickness at the outside blend radius of the weld several RTs may be required of one area to obtain the required coverage and/or film density. The additional [ASME] Code coverage gained by RT is impractical when weighed against the radiological concerns.

Therefore, TVA concludes that performing [a] UT examination of essentially 100 percent of the [volume of] the [identified] nozzle-to-vessel full penetration welds and a 100 percent enhanced remote Visual VT-1 with 1-mil wire resolution [of the identified nozzle] inner radius [sections] would be impractical. Further, it would also be impractical to perform other volumetric examinations (i.e., [RT]) which may increase examination coverage. A maximum extent practical UT examination of the subject areas provides an acceptable level of quality and safety. TVA concludes that significant degradation, if present, would be detected during an UT examination performed to the maximum extent practical of the subject welds. As a result, reasonable assurance of operational readiness of the subject welds [and nozzle radii] has been provided.

Accordingly, pursuant to 10 CFR 50.55a(g)(5)(iii), TVA requests that relief be granted for the BFN, Unit 3 Third Ten-Year ISI Inspection [ISI] Interval.

3.6 Evaluation

The ASME Code requires a volumetric examination of essentially 100 percent of the RPV nozzle-to-vessel welds and adjacent base material as depicted in ASME Code, Section XI, Figure IWB-2500-7(a). In addition, the ASME Code, Section XI, Table IWB-2500-1, Category B-D, Item 3.100 requires a volumetric examination of essentially 100 percent of the RPV nozzle inner radius as depicted in ASME Code, Section XI, Figure IWB-2500-7(a). The licensee invoked ASME Code Case N-648-1 which allows a licensee to perform an enhanced VT-1 visual examination of the inner radius of the RPV nozzles in lieu of a volumetric examination as required by the ASME Code.

For the volumetric examinations of the RPV Nozzle-to-Vessel Welds N1A, N2B, N2D, N2F, N3B, N4B, N4C, N5A, and N8A, the licensee was unable to examine essentially 100 percent of the RPV nozzle-to-vessel welds and adjacent base material as depicted in ASME Code, Section XI, Figure IWB-2500-7(a). The design configuration of the subject nozzle-to-vessel welds precludes a UT examination of essentially 100 percent of the required volume. The limitations the licensee

encountered are inherent to the barrel-type nozzle-to-vessel weld design and are compounded by their close proximity to the biological shield wall.

The licensee found that scanning from the nozzle surface is ineffective due to the weld location and the asymmetrical inside surface where the nozzle and vessel converge. However, the licensee increased coverage by scanning from the outside blend radius of the welds where practical. The licensee considered automated UT examinations from the inside surface utilizing current state-of-the-art techniques; however, at other BWRs examinations from the inside surface have shown that the nozzle-to-vessel weld coverage would not be improved to a higher level. The licensee also considered examining the subject nozzles by RT as an alternative to the UT method; however, it was determined that RT was not practical due the radiological concerns in the area. Gaining access to place radiographic film would require extensive personnel protection due to high radiation and contamination levels. In addition, because of the varying thickness at the outside blend radius of the weld, several radiographs would be required of one area to obtain the required coverage and/or film density. The additional coverage obtained by radiography is not practical in light of the radiological exposure. Based on the above, the NRC staff determined that the ASME Code requirements are impractical and that the subject RPV nozzle-to-vessel welds would be required to be redesigned in order for the licensee to meet the ASME Code requirements placing a burden on the licensee.

The licensee volumetrically examined the RPV Nozzle-to-Vessel Welds N1A, N2B, N2D, N2F, N3B, N4B, N4C, N5A, and N8A with the latest ultrasonic techniques, procedures, equipment, and personnel qualified to the requirements of PDI. Using the PDI methodology, the licensee obtained 22 percent, 42 percent, 42 percent, 42 percent, 36 percent, 39 percent, 39 percent, 38 percent, and 54 percent volumetric coverage, respectively.

Based on the volumetric coverage obtained, the NRC staff determined that any significant degradation, would have been detected during the examinations performed to the maximum extent practical on the subject welds.

Evaluation For Relief For EVT-1 Examinations of the Inner Radius of Nozzles N1A-IR, N2B-IR, N2D-IR, N2F-IR, N3B-IR, N5A-IR, and N8A-IR That Are Less Than Essentially 100 Percent

The licensee noted that for the N1A recirculation nozzle and N3B main steam outlet nozzle inner radius there are no thermal sleeves or piping inside the subject nozzles. The subject nozzles are of sufficient size to perform visual examination on the majority of the nozzle bore region. However, in order for the licensee to achieve an EVT-1 examination, the underwater camera had to be placed inside the nozzle opening using a conventional underwater camera and fixtures. The licensee was unable to maintain the required camera angle to fully examine the inner most portion of the nozzle bore. The licensee indicated that in order for the licensee to perform the ASME Code-required examinations the subject nozzles would have to be redesigned, thus placing a burden on the licensee. Based on the limitations for the inner radii surface areas of the subject nozzles, the NRC staff found that the ASME Code requirements for the nozzles prescribed are impractical.

As a result of the obstructions, the licensee was only able to obtain 90 percent of the required nozzle inner surface area with the EVT-1 visual examination. The EVT-1 visual examination performed on these nozzles' inner radius would have found any significant degradation, if present, and it would have been detected during the examinations performed to the maximum extent

practical of the subject nozzles inner radii surface areas. The NRC staff determined that since the licensee has examined 50 percent of the total Unit 3 RPV nozzle inner radius population and performed volumetric examinations obtaining 22 and 36 percent volumetric coverage, respectively, for each of the nozzle-to-vessel welds for Nozzles N1A and N3B, the absence of any significant degradation provides reasonable assurance of the overall structural integrity of the subject nozzle.

For the recirculation nozzle inlet inner radius surface area for nozzles N2B, N2D, and N2F, the licensee's Weld Examination Report R-057 noted that the EVT-1 visual examinations were limited to accessible areas of inner radius of the subject nozzles due to the location of the jet pump risers and diffusers. The license noted that the inaccessible area is the inside bend radius of the elbow at approximate clock positions 11:00 to 1:00, and at the bottom outside diameter bend of the elbow at approximate clock positions 5:00 to 7:00 of the subject nozzles. The NRC staff determined that based on the limitations for the inner radii surface areas of the subject nozzles that the ASME Code requirements are impractical. In order for the licensee to perform the ASME Code-required examinations the subject nozzles would have to be redesigned, thus placing a burden on the licensee.

The licensee was able to inspect 40 percent of the required surface examination for the subject nozzles by an EVT-1 visual examination. The EVT-1 visual examination performed on these nozzles' inner radius would have found any significant degradation, if present, and it would have been detected during the examinations performed to the maximum extent practical of the subject nozzles inner radii surface areas. The NRC staff determined that since the licensee has examined 50 percent of the total Unit 3 RPV nozzle inner radius population and performed volumetric examinations obtaining 42 percent volumetric coverage of each of the nozzle-to-vessel welds for Nozzles N2B, N2D, and N2F, the absence of any significant degradation provides reasonable assurance of the overall structural integrity of the subject nozzle.

For the N5A core spray nozzle inner radius surface area, the licensee's Weld Examination Report R-057 noted that an EVT-1 visual examination was limited to accessible areas of inner radius surface area of the subject nozzles due to the location of the feedwater spargers which are located above the core spray nozzle and the configuration of the core spray nozzle thermal sleeve and tee box. These obstructions prevented the licensee from moving the camera 360 degrees around the inside of the subject nozzle. The examinations were limited at clock positions 10:00 to 2:00, and the bottom position at positions 4:00 to 8:00. The NRC staff determined that based on the limitations noted for the inner radii surface areas of the subject nozzle that the ASME Code requirements are impractical. In order for the licensee to perform the ASME Code-required examinations the subject nozzle would have to be redesigned, thus placing a burden on the licensee.

The licensee obtained 40 percent of the required surface examination for the subject nozzle by an EVT-1 visual examination. The EVT-1 visual examinations would have found any significant degradation, if present, and it would have been detected during the examinations performed to the maximum extent practical of the subject nozzles inner radii surface areas. The NRC staff determined that since the licensee has examined 50 percent of the total Unit 3 RPV nozzle inner radius population and performed volumetric examinations obtaining 38 percent volumetric coverage of the nozzle-to-vessel weld for Nozzle N5A, the absence of any significant degradation provides reasonable assurance of the overall structural integrity of the subject nozzle.

For the N8A nozzle inner radius surface area, Weld Examination Report R-057 noted that an EVT-1 visual examination was limited to the accessible areas of the inner radius surface area of the subject nozzles due to twelve instrumentation lines that pass through the vessel wall, which

made it difficult for the licensee to maneuver the examination camera. In addition, the core shroud support plate is located directly beneath the nozzle that obstructed the examination camera's movement. These obstacles prevented the licensee from moving the camera from clock positions 4:00 to 8:00. The licensee obtained 40 percent of the required surface examination for the subject nozzle by an EVT-1 visual examination.

The NRC staff determined that based on the limitations noted for the inner radii surface areas of the subject nozzle that the ASME Code requirements are impractical. In order for the licensee to perform the ASME Code-required examinations the subject nozzle would have to be redesigned placing a burden on the licensee. Furthermore, the NRC staff determined that the EVT-1 visual examination would have found any significant degradation, if present, and it would have been detected during the examinations performed to the maximum extent practical of the subject nozzles inner radii surface areas. Since the licensee has examined 50 percent of the total Unit 3 RPV nozzle inner radius population and performed volumetric examinations obtaining 64 percent volumetric coverage of the nozzle-to-vessel weld for Nozzle N8A, the absence of any significant degradation provides reasonable assurance of the overall structural integrity of the subject nozzle.

The NRC staff has reviewed the licensee's submittal and concludes that the ASME Code examination requirements are impractical for the subject components listed in RR 3-ISI-23. In order for the licensee to perform the ASME Code-required examinations the subject nozzles would have to be redesigned, placing a burden on the licensee. It is further concluded that, if significant service-induced degradation had occurred, there is reasonable assurance that evidence of the degradation would have been detected by the examinations performed by the licensee. Furthermore, no indications were found by the licensee during the subject volumetric or visual examinations. Therefore, based on volumetric and visual examinations performed and the fact that there were no indications found, the subject examinations provide reasonable assurance of the structural integrity of the subject nozzles. For these reasons, in accordance with 10 CFR 50.55a(g)(6)(i), RR 3-ISI-23 is granted for the third 10-Year ISI Interval for Unit 3.

4.0 CONCLUSION

Based on the information provided in the licensee's submittals, the NRC staff concludes that the ASME code requirements are impractical for the components proposed and that the proposed alternative is acceptable. Additionally, the NRC finds that the absence of observed degradation for the examinations performed provides reasonable assurance of the structural integrity of the subject nozzles. Therefore, the NRC staff is granting relief for Request 3-ISI-23 pursuant to 10 CFR 50.55a(g)(6)(i). The NRC finds that this granting of relief is authorized by law and will not endanger life of property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. This relief is authorized for the remainder of the third 10-year ISI interval at Browns Ferry Unit 3, which began November 19, 2005, and ends November 18, 2015. This authorization is limited to those components described in Section 3.1 above.

Principal Contributor: Thomas McLellan

Date: September 24, 2008

Tennessee Valley Authority

BROWNS FERRY NUCLEAR PLANT

cc:
Mr. Ashok S. Bhatnagar
Senior Vice President
Nuclear Generation Development
and Construction
Tennessee Valley Authority
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Vice President
Nuclear Support
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Mr. Michael J. Lorek
Vice President
Nuclear Engineering & Projects
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Mr. D. Tony Langley, Manager
Licensing and Industry Affairs
Browns Ferry Nuclear Plant
Tennessee Valley Authority
P.O. Box 2000
Decatur, AL 35609

General Counsel
Tennessee Valley Authority
6A West Tower
400 West Summit Hill Drive
Knoxville, TN 37902

Mr. John C. Fornicola, General Manager
Nuclear Assurance
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Mr. R. G. (Rusty) West
Site Vice President
Browns Ferry Nuclear Plant
Tennessee Valley Authority
P.O. Box 2000
Decatur, AL 35609

Ms. Beth A. Wetzel, Manager
Corporate Nuclear Licensing
and Industry Affairs
Tennessee Valley Authority
4K Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Mr. James E. Emens, Jr.
Supervisor, Nuclear Site Licensing
Browns Ferry Nuclear Plant
Tennessee Valley Authority
P.O. Box 2000
Decatur, AL 35609

James B. Baptist
Browns Ferry Senior Project Engineer
Division of Reactor Projects, Branch 6
U.S. Nuclear Regulatory Commission
61 Forsyth Street, SW.
Suite 24T85
Atlanta, GA 30303-8931

Senior Resident Inspector
U.S. Nuclear Regulatory Commission
Browns Ferry Nuclear Plant
10833 Shaw Road
Athens, AL 35611-6970

State Health Officer
Alabama Dept. of Public Health
RSA Tower - Administration
Suite 1552
P.O. Box 303017
Montgomery, AL 36130-3017

Chairman
Limestone County Commission
310 West Washington Street
Athens, AL 35611

Mr. Larry E. Nicholson, General Manager
Performance Improvement
Tennessee Valley Authority
3R Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

Mr. Michael A. Purcell
Senior Licensing Manager
Nuclear Power Group
Tennessee Valley Authority
4K Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801