January 6, 2009

Mr. Dave Baxter
Vice President, Oconee Site
Duke Energy Carolinas, LLC
7800 Rochester Highway
Seneca, SC 29672

SUBJECT: OCONEE NUCLEAR STATION, UNIT 2 - RELIEF REQUEST 04-ON-009, REV. 1, REGARDING LIMITED WELD EXAMINATION COVERAGE (TAC NO. MD8106)

Dear Mr. Baxter:

By letter dated February 13, 2008, with supplement dated September 30, 2008, you submitted Relief Request 04-ON-009, Rev. 1 requesting relief from the requirements of American Society of Mechanical Engineers, *Boiler and Pressure Vessel Code*, Section XI as it pertains to the volumetric coverage requirements for weld examination for Oconee Nuclear Station, Unit 2. This letter re-submitted Relief Request 04-ON-009, Rev. 1, which was originally submitted on September 13, 2004.

We have reviewed and evaluated the information that you provided and find your request for relief acceptable. Our evaluation and conclusions are contained in the enclosed Safety Evaluation.

Sincerely,

/RA/

Melanie C. Wong, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-270

Enclosure:
Safety Evaluation

cc w/encl.: Distribution Via Listserv

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OFFICE	NRR/LPL2-1/PM	NRR/LPL2-1/LA	DCI/CPNB	OGC	NRR/LPL2-1/BC
NAME	LOlshan	MO'Brien	TChan	BMizuno	MWong
DATE	11/24/08	11/24/08	10/20/08	12/03/08	1/6/09

OFFICIAL AGENCY RECORD

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
REQUEST FOR APPROVAL OF RELIEF 04-ON-009, REV. 1
REGARDING LIMITED WELD EXAMINATION COVERAGE
OCONEE NUCLEAR STATION, UNIT 2
DUKE ENERGY CAROLINAS, LLC
DOCKET NO. 50-270

1.0 INTRODUCTION

By letter dated February 13, 2008 (ADAMS No. ML080500245), with supplement dated September 30, 2008 (ML082750499), Duke Energy Carolinas, LLC (the licensee) requested pursuant to Title 10 of the Code of Federal Regulations (10 CFR), Part 50, 50.55a(g)(5)(iii) approval of Relief Request (RR) 04-ON-009, Rev. 1 that involved limited weld examination coverage at Oconee Nuclear Station, Unit 2 (Oconee 2). Specifically, during ultrasonic examination conducted for the third 10-year inservice inspection (ISI) interval, 100-percent coverage of the required examination volume could not be obtained because of weld configuration. This request was originally submitted by letter dated September 13, 2004, as RR 04-ON-009. Subsequent to its submittal, the licensee recognized that a portion of the justification for the relief contained inaccurate wording relative to a method of detecting a leak should it develop at one of the subject welds. At that time, the licensee communicated to the U.S. Nuclear Regulatory Commission (NRC) the licensee's intent to submit a revised version of the relief to correct that issue. This request, RR 04-ON-009, Revision 1, replaces and supersedes the original request in its entirety.

2.0 REGULATORY EVALUATION

Section 50.55a(g) specifies that ISI of nuclear power plant components shall be performed in accordance with the requirements of the American Society for Mechanical Engineers (ASME), *Boiler and Pressure Vessel Code* (Code), Section XI, except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). Section 50.55a(a)(3) states that 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. Section 50.55a(g)(5)(iii) states that if the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in Section 50.4, to support the determinations.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, 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 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 of the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications

listed therein. The applicable code of record for the third ISI interval for Oconee 2 is the ASME Code, Section XI, 1989 Edition with no Addenda. The proposed relief is sought for the third 10-year ISI interval which ended on September 9, 2004.

The information provided by the licensee in support of the request has been evaluated by the NRC staff and the bases for disposition are documented below.

2.1 Licensee's Evaluation

2.1.1. Components for Which Relief is Requested

SYSTEM/COMPONENT	ASME Class	ID NUMBER	ITEM NUMBER
High Pressure Injection System Letdown Cooler 2B Inlet Nozzle to Channel Head Weld	1	2-LDCB-INLET-V1	B03.150.003
High Pressure Injection System Letdown Cooler 2B Outlet Nozzle to Channel Head Weld	1	2-LDCB-OUTLET-V2	B03.150.004
High Pressure Injection System Class 1 Piping Weld Tee to Reducer Weld	1	2HP-215-3	B09.011.017
High Pressure Injection System Class 2 Piping Weld Pipe to Valve 2HP-118 Weld	2	2-51A-17-124	C05.021.021
High Pressure Injection System Class 2 Piping Weld Valve 2HP-115 to Tee Weld	2	2-51A-17-92	C05.021.022
High Pressure Injection System Class 2 Piping Weld Valve 2HP-118 to Elbow Weld	2	2-51A-17-125	C05.021.023
High Pressure Injection System Class 2 Piping Weld Pipe to Valve 2LP-56 Weld	2	2-51A-17-20A	C05.021.051
High Pressure Injection System Class 2 Piping Weld Tee to Pipe Weld	2	2-51A-17-102	C05.021.054
High Pressure Injection System Class 2 Piping Weld Elbow to Valve 2HP-114	2	2HP-227-11	C05.021.056
High Pressure Injection System Class 2 Piping Weld Pipe to Valve 2HP-20	2	2-51A-31-50	C05.021.058

2.1.2 Code Requirements from Which Relief is Requested

Relief Request 04-ON-009, Rev. 1 requests relief from the requirements listed below:

Examination Category	Item No.	Component	Examination Requirement
B-D	B03.150.003	B3.150	Essentially 100% volumetric examination of examination volume A-B-C-D-E-F-G-H-I.
B-D	B03.150.004	B3.150	Essentially 100% volumetric examination of examination volume A-B-C-D-E-F-G-H-I.
B-J	B09.011.017	B9.11	Essentially 100% volumetric examination of examination volume C-D-E-F.
C-F-1	C05.021.021	C5.21	Essentially 100% volumetric examination of examination volume C-D-E-F.
C-F-1	C05.021.022	C5.21	Essentially 100% volumetric examination of examination volume C-D-E-F.
C-F-1	C05.021.023	C5.21	Essentially 100% volumetric examination of examination volume C-D-E-F.
C-F-1	C05.021.051	C5.21	Essentially 100% volumetric examination of examination volume C-D-E-F.
C-F-1	C05.021.054	C5.21	Essentially 100% volumetric examination of examination volume C-D-E-F.
C-F-1	C05.021.056	C5.21	Essentially 100% volumetric examination of examination volume C-D-E-F.
C-F-1	C05.021.058	C5.21	Essentially 100% volumetric examination of examination volume C-D-E-F.

ASME Code, Section XI, Code Case N-460, which has been approved for use by NRC in Regulatory Guide (RG)1.147, Revision 15, allows credit for full volume coverage of welds if it can be shown that greater than 90% examination of the required volume has been examined.

2.1.3 Impracticality/Burden Caused by Code Compliance

Relief is requested from the requirement to examine essentially 100 percent (i.e., greater than 90 percent) of the required volume specified in the ASME Code, Section XI, 1989 Edition with no addenda. Due to existing piping/valve geometry, interferences, and existing examination technology, the ultrasonic examination coverage of the subject welds did not meet the 90-percent examination coverage requirements of Code Case N-460 as discussed below.

2-LDCB-INLET-V1:

The Letdown Cooler Inlet Nozzle and Channel Head material is SA182 Grade T316L. The weld has a diameter of 3.0 inches and a wall thickness of 0.875 inches.

The licensee stated that during the ultrasonic examination of weld 2-LDCB-INLET-V1, only 29-percent coverage of the required examination volume was obtained. The coverage reported represents the aggregate coverage of all scans performed. A 45^{o} scan perpendicular and parallel to the weld covered 28 percent; a 60^{o} scan perpendicular and parallel to the weld

covered 29 percent. The licensee stated that the weld joint geometry, which is essentially a branch connection arrangement using a set-on nozzle, prevented scanning from both sides of the weld. In order to scan all of the required surfaces for the inspection of this weld, the inlet nozzle would have to be redesigned to allow scanning from both sides of the weld, which is impractical. In the volume covered by the ultrasonic examination, there were no recordable indications found during the inspection of the weld.

2-LDCB-OUTLET-V2

The letdown cooler outlet nozzle and channel head material is SA182 Grade T316L. The weld has a diameter of 3.0 inches and a wall thickness of 0.875 inches.

The licensee stated that during the ultrasonic examination of weld 2-LDCB-OUTLET-V2, only 29-percent coverage of the required examination volume was obtained. The coverage reported represents the aggregate coverage of all scans performed. A 45^{o} scan perpendicular and parallel to the weld covered 28 percent; a 60^{o} scan perpendicular and parallel to the weld covered 29 percent. The licensee stated that the weld joint geometry, which is essentially a branch connection arrangement using a set-on nozzle, prevented scanning from both sides of the weld. In order to scan all of the required surfaces for the inspection of this weld, the outlet nozzle would have to be redesigned to allow scanning from both sides of the weld, which is impractical. In the volume covered by the ultrasonic examination, there were no recordable indications found during the inspection of the weld.

2HP-215-3

The tee and reducer material is SA-403/WP304 or WP316 stainless steel. This weld has a diameter of 4.0 inches and a wall thickness of 0.531 inches.

The licensee stated that during the ultrasonic examination of weld 2HP-215-3, 88% coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage of all scans performed on the weld and adjacent base material. The 45^{o} shear wave circumferential scans, both clockwise and counter-clockwise covered 100 percent of the examination volume and the 60^{o} shear wave axial scan covered 77.7% from two directions. A supplemental 60^{o} refracted longitudinal wave scan covered 57.2 percent of the examination volume in one axial direction from the reducer side. The licensee stated that the limitation was 4 inches long on the tee side of the weld caused by the throat of the tee. In order to scan all of the required surfaces for the inspection of this weld, the tee would have to be redesigned to allow scanning from both sides of the weld, which is impractical. In the volume covered by the ultrasonic examination, there were no recordable indications found during the inspection of this weld.

2-51A-17-124

The pipe material is SA-376/TP304 or TP316 stainless steel and the valve material is A182/F316 stainless steel. This weld has a diameter of 4.0 inches and a wall thickness of 0.531 inches.

The licensee stated that during the ultrasonic examination of weld 2-51A-17-124, 34.5% coverage of the required examination volume was obtained. The percentage of coverage

represents the aggregate coverage of all scans performed on the weld and adjacent base material. The 45° shear wave circumferential scans, both clockwise and counter-clockwise covered 50 percent of the examination volume and the 60° shear wave axial scan covered 38.1 percent.

A supplemental 60° refracted longitudinal wave scan covered 61.9 percent of the examination volume in one axial direction from the pipe side. The licensee stated that the limitations were caused by the taper on the valve side of the weld which prevented scanning from that side. In order to scan all of the required surfaces for the inspection of this weld, the valve would have to be redesigned to allow scanning from both sides of the weld, which is impractical. In the volume covered by the ultrasonic examination, there were no recordable indications found during the inspection of this weld.

2-51A-17-92

The valve material is A182/F316 stainless steel and the tee material is SA-403/WP304 or WP316 stainless steel. This weld has a diameter of 4.0 inches and a wall thickness of 0.687 inches.

The licensee stated that during the ultrasonic examination of weld 2-51A-17-92, 37.5-percent coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage of all scans performed on the weld and adjacent base material. The 45° shear wave circumferential and tangential scans, both clockwise and counter-clockwise covered 50 percent of the examination volume and the 60° shear wave axial scan covered 50 percent of the examination volume from the tee side. A supplemental 60° refracted longitudinal wave scan covered 18.89 percent of the examination volume in one axial direction from the tee side. The licensee stated that the limitation was caused by the taper on the valve side of the weld which prevented scanning from that side. In order to scan all of the required surfaces for the inspection of this weld, the valve would have to be redesigned to allow scanning from both sides of the weld, which is impractical. In the volume covered by the ultrasonic examination, there were no recordable indications found during the inspection of this weld.

2-51A-17-125

The valve material is A182/F316 stainless steel and the tee material is SA-403/WP304 or WP316 stainless steel. This weld has a diameter of 4.0 inches and a wall thickness of 0.531 inches.

The licensee stated that during the ultrasonic examination of weld 2-51A-17-125, 34.5-percent coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage of all scans performed on the weld and adjacent base material. The 45° shear wave circumferential, both clockwise and counter-clockwise covered 50 percent of the examination volume and the 60° shear wave axial scan covered 38.1 percent of the examination volume from the elbow side. A supplemental 60° refracted longitudinal wave scan covered 61.9% of the examination volume in one axial direction from the elbow side. The licensee stated that the limitation was caused by the taper on the valve side of the weld which prevented scanning from that side. In order to scan all of the required surfaces for the inspection of this weld, the valve would have to be redesigned to allow scanning from both sides

of the weld, which is impractical. In the volume covered by the ultrasonic examination, there were no recordable indications found during the inspection of this weld.

2-51A-17-20A

The valve material is A182/F316 stainless steel and the pipe material is SA-312/TP304 stainless steel. This weld has a diameter of 3.0 inches and a wall thickness of 0.216 inches.
The licensee stated that during the ultrasonic examination of weld 2-51A-17-20A, 35.2-percent coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage of all scans performed on the weld and adjacent base material. The 45° shear wave circumferential, both clockwise and counter-clockwise covered 50 percent of the examination volume and the 60° shear wave axial scan covered 40.6%. A supplemental 70° shear wave scan covered 59.4 percent of the examination volume in one axial direction from the pipe side. The licensee stated that the limitation was caused by the taper on the valve side of the weld which prevented scanning from that side. In order to scan all of the required surfaces for the inspection of this weld, the valve would have to be redesigned to allow scanning from both sides of the weld, which is impractical. In the volume covered by the ultrasonic examination, there were no recordable indications found during the inspection of this weld.

2-51A-17-102

The tee material is SA-403/WP304 or WP316 and the pipe material is SA-376/TP304 or TP316 stainless steel. This weld has a diameter of 3.0 inches and a wall thickness of 0.438 inches.

The licensee stated that during the ultrasonic examination of weld 2-51A-17-102, 86.0-percent coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage of all scans performed on the weld and adjacent base material. The 45° shear wave circumferential, both clockwise and counter-clockwise covered 100 percent of the examination volume and the 60° shear wave axial scan covered 72.1 percent. A supplemental 70° shear wave scan covered 19.4 percent of the examination volume in one axial direction from the pipe side. The licensee stated that the limitation for inspecting tee side of the weld was caused by the throat of the tee. In order to scan all of the required surfaces for the inspection of this weld, the valve would have to be redesigned to allow scanning from both sides of the weld, which is impractical. In the volume covered by the ultrasonic examination, there were no recordable indications found during the inspection of this weld.

2HP-227-11

The valve material is A182/F316 stainless steel and the elbow material is SA-403/WP304 or WP316 stainless steel. This weld has a diameter of 3.0 inches and a wall thickness of 0.438 inches.

The licensee stated that during the ultrasonic examination of weld 2HP-227-11, 35.7-percent coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage of all scans performed on the weld and adjacent base material. The 45° circumferential scans, both clockwise and counter-clockwise covered 50 percent of the examination volume and the 60° scan covered 42.9 percent. A supplemental 70° shear wave scan covered 57.1 percent of the examination volume in one axial direction from the

elbow side. The licensee stated that the limitation was caused by the taper on the valve side of the weld which prevented scanning on that side. In order to scan all of the required surfaces for the inspection of this weld, the valve would have to be redesigned to allow scanning from both sides of the weld, which is impractical. In the volume covered by the ultrasonic examination, there were no recordable indications found during the inspection of this weld.

2-51A-31-50

The valve material is SA479/TP316 stainless steel and the pipe material is SA-376/TP304 stainless steel. This weld has a diameter of 3.0 inches and a wall thickness of 0.438 inches.

The licensee stated that during the ultrasonic examination of weld 2-51A-31-50, 59-percent coverage of the required examination volume was obtained. The percentage of coverage represents the aggregate coverage of all scans performed on the weld and adjacent base material. The 45^{o} shear wave circumferential scans, both clockwise and counter-clockwise covered 50 percent of the examination volume and the 60^{o} shear wave axial scan covered 36 percent. A supplemental 70^{o} shear wave scan covered 61.8 percent of the examination volume in one axial direction from the pipe side. The licensee stated that the limitation was caused by the taper on the valve side of the weld which prevented scanning on that side. In order to scan all of the required surfaces for the inspection of this weld, the valve would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications found during the inspection of this weld.

2.1.4 Proposed Alternative Examinations or Testing

The scheduled 10-year code examinations were performed on the referenced welds and resulted in the noted limited-coverage of the required ultrasonic volume. The licensee states that radiography (RT) as an alternative to ultrasonic testing for welds 2-LDCB-INLET-V1 and 2-LDCB-OUTLET-V2 is not feasible because access is not available for film placement.

For welds 2HP-215-3, 2-51A-17-124, 2-51A-17-92, 2-51A-17-125, 2-51A-17-20A, 2-51A-17-102, 2HP-227-11, and 2-51A-31-50, the licensee states that the use of RT to achieve more coverage was evaluated and discarded because RT is less sensitive to service-induced cracking and has not been subjected to the performance demonstration requirements in a manner similar to the ultrasonic method. The licensee further states that, while RT could in most cases provide more coverage, the loss of sensitivity and lack of performance demonstration militates against its use.

The licensee stated that no alternate examinations or testing were planned for the areas/welds during the third inspection interval which ended on September 9, 2004.

2.1.5 Justification for Granting Relief

Item Number B03.150

The licensee stated that ultrasonic examination of areas/welds for item number B03.150 (weld ID numbers 2-LDCB-INLET-V1 and 2-LDCB-OUTLET-V2) were conducted using personnel qualified in accordance with ASME Code, Section XI, Appendix VII of the 1995 Edition with the

1996 Addenda. The ultrasonic procedures used complied with the requirements of ASME Code, Section V, Article 4, 1989 Edition with no addenda.

The licensee used Class 1, Examination Category B-P, pressure testing and VT-2 visual examination to complement the limited scan examinations. The Code requires that a pressure test be performed after each refueling outage for Class 1. These tests require a VT-2 visual examination for evidence of leakage. The licensee stated that this testing provides adequate assurance of pressure boundary integrity.

In addition to the above Code-required examinations (volumetric and pressure tests), the licensee performed other activities to provide a high level of confidence that, in the unlikely event that leakage did occur through one of these welds, it would be detected and proper action taken. Specifically, system leak rate limitations imposed by Technical Specification 3.4.13, "Reactor Coolant System Leakage," as well as reactor building normal sump rate monitoring, provided additional assurance that any leakage would be detected prior to gross failure of the component.

Lastly, the licensee stated that these welds/components were rigorously inspected by volumetric NDE methods during construction and verified to be free from unacceptable fabrication defects. The licensee stated that it is their belief that the combination of examinations provides a reasonable assurance of quality and safety for areas/welds for item number B03.150 (weld ID numbers 2-LDCB-INLET-V1 and 2-LDCB-OUTLET-V2).

Item Number B09.011

The licensee conducted ultrasonic examination of the area/weld for item number B09.011 (weld ID number 2HP-215-3) using personnel, equipment and procedures qualified in accordance with ASME Code, Section XI, Appendix VIII, Supplement 2 of the 1995 Edition with the 1996 Addenda as administered by the Performance Demonstration Initiative (PDI). In addition to the volumetric examination with limited coverage, the licensee performed a surface examination (Code required) on the B09.011 item and achieved 100-percent coverage. The result of the surface examination was acceptable.

The licensee did not claim credit for coverage of the far side of the austenitic weld when access is limited to one side only. The characteristics of austenitic weld metal attenuate and distort the sound beam when shear waves pass through the weld. Refracted longitudinal waves provide better penetration but cannot be used beyond the first sound path leg. The licensee uses a combination of shear waves and longitudinal waves to examine single sided austenitic welds when the nominal material thickness exceeds 0.5 inch. A 60º refracted longitudinal wave is used to interrogate the far side of the weld when the nominal material thickness is greater than 0.5 inch.

The licensee further states that the procedures, personnel and equipment have been qualified through the PDI. However, although 60^{o} longitudinal wave search units and 70^{o} shear wave search units were used in the qualification and cracks were detected through the weld metal, PDI does not provide a qualification for single sided examination of similar metal austenitic piping welds.

The licensee used Class 1, Examination Category B-P, pressure testing and VT-2 visual examination to complement the limited scan examinations. The Code requires that a pressure test be performed after each refueling outage for Class 1. These tests require a VT-2 visual examination for evidence of leakage. The licensee stated that this testing provides adequate assurance of pressure boundary integrity.

In addition to the above Code-required examinations (volumetric and pressure tests), the licensee will perform other activities which provide a high level of confidence that, in the unlikely event that leakage did occur through one of these welds, it would be detected and proper action taken. Specifically, system leak rate limitations imposed by Technical Specification 3.4.13, "Reactor Coolant System Leakage," as well as reactor building normal sump rate monitoring, provide additional assurance that any leakage would be detected prior to gross failure of the component.

Lastly, the licensee stated that this weld/component was rigorously inspected by volumetric NDE methods during construction and verified to be free from unacceptable fabrication defects. The licensee stated that it is their belief that the combination of examinations provides a reasonable assurance of quality and safety for area/weld for item number B9.11 (weld ID number 2HP-215-3).

Item Number C05.021

The licensee conducted ultrasonic examinations of areas/welds for item number C05.021 (weld ID numbers 2-51A-17-124, 2-51A-17-92, 2-51A-17-125, 2-51A-17-20A, 2-51A-17-102, 2HP-227-11, and 2-51A-31-50) using personnel, equipment and procedures qualified in accordance with ASME Code, Section XI, Appendix VIII Supplement 2 of the 1995 Edition through the 1996 Addenda as administered by the PDI. In addition to the volumetric examination with limited coverage, the licensee performed a surface examination (Code required) on each of the C05.021 items and achieved 100-percent coverage. The results from the surface examinations were acceptable.

In addition to the C05.021 welds that relief is being requested for limited scanning, there were 11 additional C05.021 welds that surface and volumetric examinations were performed on. The examinations did not identify any recordable indications and 100% coverage was obtained on each of the 11 welds. The 11 additional welds were from the same system as the C05.021 welds of this request.

The licensee did not claim credit for coverage of the far side of the austenitic weld. The characteristics of austenitic weld metal attenuate and distort the sound beam when shear waves pass through the weld. Refracted longitudinal waves provide better penetration but cannot be used beyond the first sound path leg. The licensee used a combination of shear waves and longitudinal waves to examine single sided austenitic welds when the nominal material thickness exceeds 0.5 inches. A 70^{o} shear wave angle beam is used to interrogate the far side of the weld when the nominal material thickness is equal to or less than 0.5 inches and a 60^{o} refracted longitudinal wave is used to interrogate the far side of the weld when the nominal material thickness is greater than 0.5 inches.

The licensee used Class 2, Examination Category C-H, pressure testing and VT-2 visual examination to complement the limited examination coverage. The Code requires that a pressure test be performed once each period for Class 2 items. These tests require a VT-2 visual examination for evidence of leakage. The licensee stated that this testing provides adequate assurance of pressure boundary integrity.

In addition to the above Code-required examinations (volumetric and pressure tests), there are other activities which provide a high level of confidence that, in the unlikely event that leakage did occur through one of these welds, it would be detected and proper action taken. Specifically, system leak rate limitations imposed by Technical Specification 3.4.13, "Reactor Coolant System Leakage," as well as visual observations performed during operator rounds, provide additional assurance that any leakage would be detected prior to gross failure of the component.

Lastly, the licensee stated that these welds/components were rigorously inspected by volumetric NDE methods during construction and verified to be free from unacceptable fabrication defects. The licensee believes that the combination of examinations provides a reasonable assurance of quality and safety for areas/welds for item number C05.021 (weld ID numbers 2-51A-17-124, 2-51A-17-92, 2-51A-17-125, 2-51A-17-20A, 2-51A-17-102, 2HP-227-11, and 2-51A-31-50).

3.0 NRC STAFF'S EVALUATION

The NRC staff has evaluated the information provided by the licensee in support of the volumetric examinations of the subject welds performed during the third 10-year inservice inspection interval. For the subject welds, ultrasonic scanning in the axial direction could be performed from only one side of the weld due to component configuration and geometries which prevented scanning from the other side of the weld. The licensee's best effort examination with single sided access achieved volumetric coverages of the welds ranging from 29 percent to 88 percent. The NRC staff asked the licensee whether it had considered additional surface preparation to increase inspection coverage for the 10 welds included in this Relief Request. The licensee's September 30, 2008, response stated that "all limitations are caused by the physical geometry of each component, such as tee or valve configurations, that result in single sided coverage. Additional surface preparation would not remove the scan limitations and therefore would not increase the obtained coverage. Only a change in the component design would permit additional coverage." The NRC staff finds this alternative to be impractical and would impose undue burden to the licensee.

Code Case N-460 which was approved for use by the NRC in RG 1.147, Revision 15, allows credit for full volume coverage if it can be shown that more than 90 percent of the required volume has been examined.

The NRC staff has determined that the examination coverage of the subject welds was reduced due to component configuration and geometries which restricted scanning to the ranges identified above. In addition to the volumetric examinations, the licensee performed surface examinations on all the welds. The results of the surface examinations were acceptable. For three of the welds, the licensee stated that they used Class 1, Examination Category B-P pressure testing and VT-2 visual examinations to complement the applicable limited examination coverage. For the other seven welds, the licensee stated that they used Class 2, Examination Category C-H, pressure testing, and VT-2 visual examinations to complement the

applicable limited examination coverage. The licensee stated that during refueling outage 2EOC 20 (spring 2004), there was no through-wall leakage observed for all 10 welds during these pressure tests. Based on its review of the information provided, the NRC staff finds that the licensee's proposed alternative provides reasonable assurance of structural integrity of the subject welds. This conclusion is based on the fact that the subject welds have been examined volumetrically to the extent practical (using 45^{o} and 60^{o} shear waves and either 60^{o} refracted longitudinal or 70^{o} shear wave supplemental inspections achieving an aggregate coverage of 29% to 88%) with no recordable indications found during these inspections. Additionally, the volumetric inspections were supplemented by additional examinations. Therefore the NRC staff would expect that any significant degradation, if present, should have been detected.

In order to meet the Code requirements, the components would have to be redesigned, fabricated, and installed in the systems, which would impose a burden on the licensee. Based on the access limitations, it is impractical for the licensee to meet the Code coverage requirements.

4.0 CONCLUSION

The NRC staff has reviewed the licensee's submittal and has concluded that compliance with the Code requirements for volumetric coverage of the subject welds is impractical due to component configuration. The NRC staff has also determined that if the Code requirements were to be imposed on the licensee, the components must be redesigned, which would impose significant burden on the licensee. The staff finds the examination coverage of the accessible weld volume as complemented by the additional examinations performed by the licensee provide reasonable assurance of structural integrity of the subject welds. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the third 10-year inservice inspection interval of Oconee Nuclear Station, Unit 2 which ended on September 9, 2004. This granting of relief is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee if the requirements were imposed on the facility.

All other ASME Code, Section XI requirements for which relief was not specifically requested and authorized herein by the NRC staff remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

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