December 14, 2004

Mr. Ronald A. Jones, Vice President
Oconee Nuclear Station
Duke Energy Corporation
7800 Rochester Highway
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SUBJECT: OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3 - RELIEF REQUEST 04-ON-008 FROM CERTAIN NON-DESTRUCTIVE EXAMINATION REQUIREMENTS OF THE CODE OF RECORD (TAC NOS. MC4374, MC4375, AND MC4376)

The NRC staff has reviewed the information provided by Duke Energy Company, (the licensee) in its letter dated September 13, 2004. The licensee requested that the NRC approve a request for relief from certain non-destructive examination requirements of the original Construction Code of Record for Oconee Nuclear Station, Units 1, 2, and 3. The request was made pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(a)(3)(ii).

The NRC staff finds the licensee's request acceptable as discussed in the enclosed Safety Evaluation. The relief is authorized for the fourth 10-year inservice inspection (ISI) interval for Oconee, Units 1 & 2, and the third 10-year ISI interval for Oconee, Unit 3. However, for inservice inspections of the replaced, upgraded piping, and the embedded piping during future intervals, the licensee will be required to submit a request for relief for the embedded piping pursuant to 10 CFR 50.55a(a)(3)(ii).

Sincerely,

/RA/

John A. Nakoski, Section Chief,
Section 1 Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-269, 50-270, and 50-287

Enclosure: As stated

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR RELIEF 04-ON-008

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

DUKE ENERGY COMPANY

DOCKET NOS. 50-269, 50-270, AND 50-287

1.0 INTRODUCTION

By letter dated September 13, 2004, Duke Energy Company, (the licensee), requested that the Nuclear Regulatory Commission (NRC) approve Relief Request 04-ON-008 from certain non-destructive examination (NDE) requirements of the construction code of record for Oconee Nuclear Station, Units 1, 2, and 3. The licensee provided additional clarifying information, which is available under ADAMS accession number ML043350023.

2.0 REGULATORY EVALUATION

Inservice inspection (ISI) of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components is performed in accordance with Section XI of the ASME Code and the applicable addenda as required by Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g), except where relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states that alternatives to the requirements of (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 (ISI) 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 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. The applicable edition of Section XI of the ASME Code for the applicable nuclear power plants are listed below:

PLANT	ISI INTERVAL	EDITION
Oconee Nuclear Station Unit 1	Fourth	1998 Edition, 2000 Addenda
Oconee Nuclear Station Unit 2	Fourth	1998 Edition, 2000 Addenda
Oconee Nuclear Station Unit 3	Third	1989 Edition

System/Components for Which Relief is Requested

The system/component that is affected is a section of piping that is part of the drain path from the Oconee Reactor Building Emergency Sump (RBES) to the Liquid Waste Disposal (LWD) System. The licensee stated that following implementation of Oconee specification Nuclear Station Modification (NSM) ON-33106, this piping system will provide part of the High Pressure Injection (HPI) Pump minimum flow return path to the RBES following a loss-of-coolant accident (LOCA).

The licensee stated the particular section of piping of concern is the 4-inch drain piping from the RBES (located in the Reactor Building) up to the edge of the Auxiliary Building wall. The 4-inch and 2-inch section of pipe in the Auxiliary Building will be inspected. The licensee stated that using the definition in the Updated Final Safety Analysis Report (UFSAR), Problem Investigation Process (PIP) O-02-1233 identified a discrepancy for this pipe. Section 3.2.2.1 of the UFSAR states the following:

> Class II (Duke Class B) systems normally contain radioactive fluid whose temperature is above 212EF, and in addition, those portions of Engineered Safeguard Systems outside the Reactor Building which may see recirculated reactor building sump water following a Loss of Coolant Accident (LOCA). Class III (Duke Class C) systems, or portions of systems, are those which would normally be Class II except that the contained fluid is less than 212EF.

PIP O-02-1223 also states that the current design temperature for the RBES drain piping is 300EF.

The licensee stated that Oconee specification NSM ON-33106 will replace the existing LWD pipe with new piping starting approximately 8 inches from where the embedded pipe exits the Auxiliary Building wall through valve 3LWD-103. The piping and associated components installed by NSM ON-33106 will be Class II (Duke Class B). The remaining pipe, all that is embedded plus 8 inches, must be upgraded to Class II (Duke Class B) as required by the UFSAR due to the addition of the HPI pump minimum flow return path. In addition, upgrading the piping to Class II (Duke Class B) will resolve PIP O-02-1233. The additional information provided by the licensee stated that the actual length of piping that is embedded and cannot be inspected is approximately 55 feet.

Licensee's Code Requirement

As stated in PIP O-02-1233, the current piping classification does not conform to the requirements set forth in UFSAR Section 3.2.2.1.

The licensee stated that following implementation of NSM ON-33106, the embedded piping will provide part of the HPI pump minimum flow return path to the RBES following a LOCA. The HPI pump minimum flow can be considered recirculated reactor building sump water and Class II requirements apply. Therefore, the embedded piping of the RBES drain line must be upgraded to Class II (Duke Class B).

The licensee stated the design requirements for Class II piping are defined in USA Standard (USAS) B31.7 "Nuclear Power Piping", Section 2-701 and 2-702. The design requirements for Class III piping are defined in USAS B31.7 Section 3-701 and 3-702. The licensee stated the only difference between Class II and Class III piping as specified in USAS B31.7 are the NDE requirements.

Licensee's Code Requirement from Which Relief is Requested

The licensee's RBES embedded drain piping is Class III (Duke Class C). This piping provides a drain path for the RBES to the LWD System. However, the licensee stated, that upon completion of NSM ON-33106, this piping will also provide a path for the HPI pump minimum flow to the RBES following a LOCA. The HPI pump flow can be considered recirculated reactor building sump water and Class II requirements would apply. The licensee stated the purpose of this document is to request relief from the NDE requirements of Class II for the existing embedded piping welds. The licensee stated that inspecting the embedded piping welds per the Class II requirements would involve extreme hardship without a compensating increase in the level of quality and safety.

The licensee stated that design requirements for Class II piping are defined in USAS B31.7 Section 2-701 and 2-702. Class II piping requires the following NDE (USAS B31.7, Sections 2-727 and 2-736.5 for Unit 1, Section 2-736.6 for Units 2 and 3, and Table A.7(b)):

a) 100 percent radiographic testing of all butt welds (girth and longitudinal)
b) 100 percent radiographic testing of branch welds over 4 inches nominal pipe size
c) 100 percent magnetic-particle and dye-penetrant testing (MT/PT) of all fillet/socket/seal/attachment/branch welds

The licensee stated the design requirements for Class III piping are defined in USAS B31.7, Section 3-701 and 3-702. The licensee stated that weld inspection requirements during construction for Duke Class C components/piping were not as stringent as those for Class II piping components. Class III piping requires the following NDE (USAS B31.7, Section 2-736.5 for Unit 1, Section 2-736.6 for Units 2 and 3, Chapter 3-VI, and Table A.7(b)):

a) Radiographic testing 1 weld for every 10 butt welds a welder makes over 4 inches
b) MT/PT one weld for every 10 fillet/socket/branch welds over 4 inches in diameter that a welder makes

The licensee stated that Class II and Class III both default to the same set of rules, specifically USAS B31.1.0-1967 “Nuclear Power Piping”. The licensee stated that all new piping installed by NSM ON-33106 will be installed and inspected to the current Class II requirements. The remaining piping is embedded. The licensee stated that complying with the Class II requirement would result in hardship or unusual difficulty without a compensating increase in quality or safety pursuant to 10 CFR 50.55a(a)(3)(ii).

Licensee Basis for Relief

The licensee stated that Oconee Piping Specification OS-0243.00-00-0001, Appendix A, and Regulatory Guide 1.26 were used to evaluate the piping upgrade. The licensee stated that the portion of piping to be upgraded will not affect any valves, components or instruments. The affected embedded piping welds are identified as 62, 63, 64, 65, 66, 67, 68, and 69, and are shown on weld isometric 3-59-0016, which was provided to the NRC by the licensee.

The licensee stated NSM ON-33106 is installing new LWD piping approximately 8 inches from the embedded pipe through valve 3LWD-103. The licensee stated that the new piping and valves for NSM ON-33106 are being purchased, installed and inspected as Duke Class B (Class II).

The licensee stated that the original construction code requirements will be considered in this evaluation for the embedded piping since no modifications or weld repairs have ever been performed on this portion of the RBES drain line. The licensee stated the original code of construction is USAS B31.7 (February 1968 edition and the June 1968 errata) for Unit 1, and USAS B31.7 (August 1969 edition) for Units 2 and 3. The licensee considered the following items as part of its evaluation:

Piping Design

The licensee stated that the existing 4-inch drain piping from the RBES is shown on Oconee drawing OFD-107D-3.2 as Duke Class C (Class III) piping. However, Oconee Piping Summary (OPS-59.00-3) and original documentation indicates that the original piping was Duke Class E. The licensee states that PIP O-02-04984 documents that this piping was upgraded from Duke Class E to Duke Class C. PIP O-02-04984 also identifies, and the licensee confirmed, that the correct NDE was performed on this piping and that the weld isometrics were revised.

The licensee stated that according to OS-0243.00-00-0001, Appendix A, original Duke Class E piping was designed and installed to the same code requirements as Duke Class C (Class III). Therefore, Duke Class E piping was essentially treated as if it were Duke Class C, with the exclusion of the seismic design considerations. Since Duke Class B (Class II) and Duke Class C (Class III) were designed and constructed to the requirements of USAS B31.7, the licensee performed a comparison between the chapters within USAS B31.7 that defined the requirements for Class II and Class III piping.

The licensee concluded that the design requirements for Class II and Class III piping both default to the same set of rules, specifically USAS B31.1.0-1967.

Piping Components

The licensee stated that the piping design requirements for Class II piping are defined in USAS B31.7, Sections 2-703 through 2-709. The design requirements for Class III piping are defined in USAS B31.7, Sections 3-703 through 3-709. The licensee stated that both Class II and Class III piping fall back to the same set of rules, specifically, USAS B31.1.0-1967. The licensee identified two differences that existed with respect to the pressure design of components:

1) Class III piping allowed the use of Table A.9 stress values.

2) Flanges for Class II piping were designed to a different standard than those for Class III piping.

Following a review of the applicable drawings, the licensee determined that no flanges are installed in the embedded section of the piping.

Materials

The licensee stated the Oconee Piping Summary 59.00-03, Revision 1, shows that the embedded RBES drain line between the emergency sump and valve 3LWD-103 was originally installed as stainless steel piping per Pipe Specification 151.4, which is used for Duke Class C and E piping. Pipe Specification 151.2 is used for Duke Class B piping. A comparison of the two pipe specifications show that the material requirements are the same except as listed below:

- Pipe Specification 151.4: ASME A-312 material is specified, however SA-312 material may be used per the original requirements of Oconee.

- Pipe Specification 151.2: ASME SA-312 material is specified, however A-312 material may be used per the original requirements of Oconee.

The licensee stated the material used for the embedded piping was ASME A-312, which is acceptable for Class II and Class III.

The licensee stated that after the piping upgrade, Oconee specification Oconee Flow Diagram 107D-3.2 will show that the embedded piping is Duke Class B and any future modification to this line will have to be performed in accordance with Class B guidelines.

Examination and Inspection of Welds

The licensee stated that PIP 02-04984 documents that the weld tickets for the embedded piping were reviewed to ensure that the correct NDE for Class III piping was performed when the piping was upgraded from Duke Class E to Duke Class C.

The licensee stated that all new piping installed by NSM ON-33106 will be installed and inspected to the current Class II requirements. The remaining embedded piping cannot be inspected to the NDE requirements for Class II piping without significant hardship.

Fabrication, Assembly, and Erection

The licensee stated that after reviewing the welding details, the documentation shows that only consumable inserts were allowed for use on the embedded stainless steel piping welds for which relief is requested. The licensee stated the consumable inserts were allowed for both Class II and Class III piping.

The licensee reviewed the weld records for the original code of construction and identified the welding process used was the Gas Tungsten Arc Welding process and all welding was performed by a single welder. Additionally, the licensee verified that the proper NDE examination had been performed.

Pressure Test

The licensee reviewed the pressure test requirements and concluded that the leak testing for Class III piping during construction was the same as the leak testing requirements for Class II piping. The licensee stated that no additional leak testing is required for the embedded piping since the existing embedded piping will not be modified.

Licensee's Justification for Relief

As the licensee stated previously, a comparison of the requirements for Class II and Class III piping showed that the subject piping meets all requirements of Class II except for the NDE requirements. The licensee stated that in order to meet the full requirements of Class II piping, all of the concrete would have to be removed to allow the applicable inspection of the subject piping. The licensee stated that this would result in a significant hardship without a compensating increase in the level of quality and safety.

The licensee also noted that the subject piping has been in operation for over 30 years without the need for maintenance or repair. The licensee stated that future maintenance or repair activities will be performed in accordance with the requirements of Class II piping.

3.0 STAFF EVALUATION

The licensee is performing a modification on each unit that will upgrade a section of existing piping such that additional NDE will be required. However, a portion of that piping on each unit is embedded such that NDE inspection of that portion would involve a significant hardship without a compensating increase in the level of quality and safety. The licensee's request for relief was made pursuant to 10 CFR 50.55a(a)(3)(ii).

The particular section of piping of concern is the 4 inch drain piping from the RBES (located in the Reactor Building) up to the inside edge of the Auxiliary Building wall. Using the definition in the UFSAR, the licensee's PIP O-02-1233 identified a discrepancy for this pipe. The UFSAR, Section 3.2.2.1 states the following:

> Class 1 (Duke Class B) systems normally contain radioactive fluid whose temperature is above 212EF, and in addition, those portions of Engineered Safeguard Systems outside the Reactor Building which may see recirculated reactor building sump water following a Loss of Coolant Accident (LOCA). Class III (Duke Class C) systems, or portions of

systems, are those which would normally be Class II except that the contained fluid is less than 212EF.

PIP O-02-1233 also states that the current design temperature for the RBES drain piping is 300EF.

Additionally, following the licensee's upgrade implementation of NSM ON-33106, the piping will provide part of the HPI pump minimum flow return path to the RBES following a LOCA. The HPI pump minimum flow can be considered recirculated reactor building sump water and Class II requirements apply. Therefore, the embedded piping of the RBES drain line must be upgraded to Class II (Duke Class B).

The licensee performed a comparison of the requirements for Class II and Class III of the subject piping and considered the following items:

- Piping Design
- Piping Components
- Materials
- Examination and Inspection of Welds
- Fabrication and Inspection of Welds
- Pressure Tests

The licensee concluded that the subject piping meets all the requirements of Class II piping except for the NDE requirements.

The licensee stated that Class II and Class III both default to the same set of rules, specifically USAS B31.1.0-1967. The licensee stated that all new piping installed by NSM ON-33106 will be installed and inspected to the current Class II requirements. The remaining piping is embedded.

In order for the licensee to meet the full requirements of Class II piping, all of the concrete would have to be removed to allow the inspections of the subject piping. This action would result in a significant hardship without a compensating increase in the level of quality and safety. The NRC staff agrees that removing all of the concrete to allow the inspections to meet the full requirements of Class II piping would result in hardship without a compensating increase in quality and safety.

The licensee also stated that the subject piping has been in operation for over 30 years without the need for maintenance or repair. Any future maintenance or repair activities will be performed according to the requirements of Class II piping. The NRC staff considers the licensee's approach to be acceptable.

Based upon the information provided above, the NRC staff finds the licensee's reasoning in support of its request for relief to be acceptable.

4.0 CONCLUSION

Based on the information provided in the licensee's submittal, the NRC staff concludes that performing the required Class II NDE on a portion of embedded piping would involve hardship without a compensating increase in the level of quality and safety. Therefore, the proposed request for relief from certain NDE requirements of the Construction Code of Record pursuant to 10 CFR 50.55a(a)(3)(ii) for Oconee, Units 1, 2, and 3 is authorized for the fourth 10-year ISI interval for Oconee, Units 1, and 2, and the third 10-year ISI interval for Oconee, Unit 3. For inservice inspections of the replaced, upgraded piping, and the embedded piping during future intervals, the licensee will be required to request relief for the welds associated with the embedded piping. 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.

Principal Contributor: E. Reichelt

Date: December 14, 2004

Oconee Nuclear Station, Units 1, 2, and 3

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