

May 4, 2006

Mr. Bruce H. Hamilton  
Vice President, Oconee Site  
Duke Energy Corporation  
7800 Rochester Highway  
Seneca, SC 29672

SUBJECT: RELIEF REQUEST 05-ON-003 FOR OCONEE NUCLEAR STATION, UNITS 1,  
2, AND 3 (TAC NOS. MC6719, MC6720, AND MC6721)

Dear Mr. Hamilton:

By letter dated April 6, 2005, you submitted Relief Request No. 05-ON-003 for Oconee Nuclear Station, Units 1, 2, and 3, which is applicable to certain portions of the reactor building normal sump drain piping embedded in concrete. You requested relief from the nondestructive examination (NDE) requirements for welds in the drain piping pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.55a(a)(3)(ii). The NDE requirements are mandated under the original Construction Code of Record, USA Standard B31.7, Nuclear Power Piping, as a result of your modification to upgrade the piping from Class III to Class II. You stated that the pertinent requirements of the original Construction Code of Record for Class II piping will be met except for the NDE requirement for inspection of the welds in the embedded portion of the piping.

We find your request acceptable as discussed in the enclosed safety evaluation. Future inservice inspection of the upgraded piping should be performed under the American Society of Mechanical Engineers, *Boiler and Pressure Vessel Code*, Section XI, and you should request separate relief, as needed, for the embedded piping pursuant to 10 CFR 50.55a(g)(5)(iv).

Sincerely,

**/RA/**

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

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

Enclosure: Safety Evaluation

cc w/encl: See next page

Oconee Nuclear Station, Units 1, 2, and 3

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR RELIEF 05-ON-003

OCONEE NUCLEAR STATION UNITS 1, 2, AND 3

DUKE ENERGY CORPORATION

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

1.0 INTRODUCTION

By letter dated April 6, 2005, Duke Energy Corporation (the licensee) submitted Relief Request No. 05-ON-003 for Oconee Nuclear Station, Units 1, 2, and 3, which is applicable to certain portions of the reactor building normal sump (RBNS) drain piping embedded in concrete. The licensee requested relief from the nondestructive examination (NDE) requirements for welds in the drain piping pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.55a(a)(3)(ii). The NDE requirements are mandated under the original Construction Code of Record, USA Standard B31.7, Nuclear Power Piping, as a result of the licensee's modification to upgrade the piping from Class III to Class II. The licensee stated that the pertinent requirements of the original Construction Code of Record for Class II piping will be met except for the NDE requirement for inspection of the welds in the embedded portion of the piping.

2.0 REGULATORY EVALUATION

Inservice inspection (ISI) of American Society of Mechanical Engineers (ASME), *Boiler and Pressure Vessel (Code)*, Class 1, 2, and 3 components are performed in accordance with Section XI of the ASME Code and the applicable addenda as required by 10 CFR 50.55a(g), except where 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 50.55a(g) may be used, when authorized by the Nuclear Regulatory Commission (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 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.

Enclosure

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) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable editions of Section XI of the ASME Code of Record for each of the Oconee units are identified in the following table.

PLANT	ISI INTERVAL	ASME CODE OF RECORD, SECTION XI, 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

In accordance with the above inservice inspection Codes of Record, the repair/replacement activities, including modifications, may meet the original Construction Code of Record, which is the USAS B31.7 for each of the units at Oconee.

#### 2.1 System/Components for Which Relief is Requested

The affected system/component is a section of piping that is part of the drain path from the Oconee RBNS to the liquid waste disposal system. The particular section of piping of concern is a Class III 4" embedded drain pipe between the RBNS (located in the reactor building) and the edge of the auxiliary building wall.

The Updated Final Safety Analysis Report (UFSAR), Section 3.2.2.1, System Classification, states:

##### *Class II (Duke Class B)*

Class II systems, or portions of systems, are those where loss or failure could cause a hazard to plant personnel but would present no hazard to the public. Class II systems normally contain radioactive fluid with a temperature above 212 EF, 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). Piping 1 inch and less is excluded.

##### *Class III (Duke Class C)*

Class III systems, or portions of systems, are those which would normally be Class II except that the contained fluid is less than 212 EF. Valves, piping, instrument fittings and thermowells with a penetration area equal to or less than a 1 inch i.d. pipe or less (all schedules) are placed in Class III regardless of system temperature or pressure, when such equipment is connected to Class I, II, or III systems.

During a LOCA, the RBNS drain line could contain recirculated reactor building sump water. The embedded piping of concern was installed as Class III (Duke Class C). However, by the definition in the UFSAR, it should be classified as Class II (Duke Class B). This discrepancy, related to the system classification for the RBNS drain piping, was identified in the licensee's piping specification, PIP O-98-2014.

The design temperature for the RBNS drain piping is 300 EF. The specific Class II drain pipe welds for Units 1, 2, and 3, identified in the table below, are embedded in concrete, and, therefore, cannot be examined in accordance with the original Construction Code for which the request for relief is applicable.

Unit 1	Unit 2	Unit 3
1-59-4-1	2-59-5-139B	3-59-16-1
1-59-4-2	2-59-5-138B	3-59-16-109
1-59-4-174A	2-59-5-137B	3-59-16-2
1-59-4-3	2-59-5-136B	3-59-16-3
1-59-4-4	2-59-5-135B	3-59-16-4
1-59-4-5	2-59-5-134B	3-59-16-5

## 2.2 Code Requirement

The Construction Code of Record for Oconee Unit 1 is USAS B31.7 (February 1968) including June 1968 Errata, and for Units 2 and 3 it is USAS B31.7 (August 1969).

The licensee stated that the design requirements for Class II piping are defined in USAS B31.7, Sections 2-701 and 2-702. The design requirements for Class III piping are defined in USAS B31.7, Sections 3-701 and 3-702. The design requirements of Class II and Class III piping are identical. The licensee further stated that the only differences between the Code requirements for Class II and Class III piping, as stipulated in B31.7, are the following NDE requirements: (1) 100-percent radiography for Class II versus 10-percent radiography for Class III for all butt welds, and (2) 100-percent liquid penetrant (PT) or magnetic particle (MT) test for Class II versus 10 percent for Class III fillet welds in piping greater than 4 inches in diameter.

## 2.3 Code Requirement from Which Relief is Requested

The licensee stated that compliance with the Class II NDE requirement for embedded piping would result in hardship or unusual difficulty without a compensating increase in quality or safety pursuant to 10 CFR 50.55a(a)(3)(ii). Therefore, the licensee requested relief from the following NDE requirements of the Construction Code of Record for the Class II embedded piping welds identified above:

- a) 100-percent radiographic testing of all butt welds (girth and longitudinal)

- b) 100-percent liquid penetrant or magnetic-particle testing of all fillet/socket/seal/attachment/ branch welds

The licensee stated that the weld inspection requirements during construction of Duke Class C components/piping were not as stringent as those for Class II piping components.

Accordingly, Class III pipe welds require the following NDE (USAS B31.7 Sections 2-736.5 (Unit 1), 2-736.6 (Units 2 and 3), Chapter 3-VI and Table A.7(b)):

- a) Radiographic testing of 1 for every 10 butt welds for pipes greater than 4 inches in diameter
- b) MT or PT of 1 for every 10 fillet/socket/branch welds for pipes greater than 4 inches in diameter

#### 2.4 Basis for Relief

The licensee stated that the Oconee Piping Specification OS-0243.00-00-0001, Appendix A, UFSAR Section 3.2.2.1 and Regulatory Guide 1.26 were used to evaluate the piping upgrade. The portion of piping to be upgraded will not effect any valves, components or instruments.

All of the exposed piping and welds were inspected to the requirements of Class II (Duke Class B) at the time of construction. A review of available information confirmed that the installed material met the purchase requirements for Duke Class B. The original Construction Code requirements for Class II in regard to materials, design, fabrication, installation and testing of piping and components were met for the RBNS drain line.

#### 3.0 STAFF EVALUATION

In Relief Request No. 05-ON-003, the licensee requested relief from specific NDE requirements of the original Construction Code of Record for Oconee Nuclear Station, Units 1, 2, and 3, in order to perform modifications to upgrade the RBNS drain lines from Class III to Class II. Specifically, the licensee is performing a modification for each unit that will upgrade a section of existing piping such that additional NDE will be required. However, a portion of that piping is embedded in concrete such that NDE of that portion would result in a hardship without a compensating increase in the level of quality and safety. The licensee's request was made pursuant to 10 CFR 50.55a(a)(3)(ii).

The section of piping of concern is the Class III 4-inch drain piping between the RBNS (located in the Reactor Building) and the inside edge of the auxiliary building wall. Using the definition in the UFSAR, the licensee found a discrepancy for this length of pipe in the piping specification, PIP O-98-2014. UFSAR, Section 3.2.2.1 states that "Class II (Duke Class B) systems normally contain radioactive fluid whose temperature is above 212 EF, and in addition, those portions of Engineered Safeguard Systems outside the Reactor Building which may contain recirculated reactor building sump water following a 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 212 EF." The licensee stated that the current design temperature for the RBNS drain piping is 300 EF. Therefore, the piping for the RBNS drain line needs to be upgraded to Class II (Duke Class B) on the basis of its design.

The licensee performed a comparison of the Code requirements for Class II and Class III of the subject piping in regard to the following items:

1. Piping Design
2. Piping Components
3. Materials
4. Examination and Inspection of Welds
5. Fabrication and Inspection of Welds
6. Pressure Tests

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

In order for the licensee to comply with the NDE requirements of Class II piping, all of the concrete would have to be removed to allow inspections of the subject piping. This action would result in a hardship to the licensee without a compensating increase in the level of quality and safety. The licensee further stated that the subject piping has been in operation for more than 30 years without any evidence of leakage. The NRC staff noted that the RBNS system is a low-pressure system with low operating stresses and, further, the industry operating experience with the system to-date has not indicated any potential concern with the piping pressure boundary. The NRC staff also considered in its evaluation the consequence of not performing the required NDE of the upgraded piping embedded in concrete and noted that the periodic system leakage test of the Class II buried piping required under applicable ASME Code, Section XI, will provide reasonable assurance of operational readiness. The NRC staff, therefore, has determined that the licensee's request for relief is acceptable.

#### 4.0 CONCLUSION

Based on the information provided in the licensee's submittal, the NRC staff concludes that performance of applicable NDE of the embedded RBNS drain line piping in compliance with the original Construction Code would result in a 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 is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for Oconee Nuclear Station Units 1, 2, and 3. For future inservice inspection of the upgraded piping to be performed under ASME Code, Section XI, the licensee should request separate relief as needed for the embedded portion of piping pursuant to 10 CFR 50.55a(g)(5)(iv). All other ASME Code, Section XI, requirements for which relief was not specifically requested and authorized herein by the NRC staff remain applicable, including a third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: P. Patniak

Date: May 4, 2006



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Mr. Bruce H. Hamilton  
Vice President, Oconee Site  
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Sincerely,

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

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

Enclosure: Safety Evaluation

cc w/encl: See next page

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