

July 11, 2006

Mr. Bruce H. Hamilton  
Vice President, Oconee Site  
Duke Power Company LLC  
7800 Rochester Highway  
Seneca, SC 29672

SUBJECT: THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN  
REQUEST FOR RELIEF 04-ON-013, REVISION 1 FOR OCONEE NUCLEAR  
STATION, UNITS 1, 2, AND 3 (TAC NOS. MD1542, MD1543, AND MD1544)

Dear Mr. Hamilton:

We have reviewed and evaluated the information that you provided in your letter dated February 17, 2005, which submitted Request for Relief (RR) 04-ON-013, Revision 1 for the third 10-year interval inservice inspection (ISI) for Oconee Nuclear Station, Units 1, 2, and 3. We found relief RR-04-ON-013, Revision 1 acceptable for the third 10-year ISI interval, and our evaluation and conclusions are contained in the enclosed safety evaluation.

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

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

THIRD 10-YEAR INTERVAL INSERVICE INSPECTION

REQUEST FOR RELIEF 04-ON-013, REVISION 1

OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3

DUKE POWER COMPANY LLC

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

1.0 INTRODUCTION

The Nuclear Regulatory Commission (NRC) staff has reviewed and evaluated the information provided by Duke Power Company LLC (the licensee), in its letter dated February 17, 2005, which proposed its Third 10-Year Interval Inservice Inspection (ISI) Program Plan, Request for Relief (RR) 04-ON-013, Revision 1 for Oconee Nuclear Station, Units 1, 2, and 3 (Oconee 1/2/3). The licensee first submitted its alternative on December 21, 2004, for Oconee 1/2 prior to performing the alternative system leakage test in the first outage of the fourth 10-Year ISI interval for Oconee 1/2. When the licensee found it was unable to perform the American Society of Mechanical Engineers (ASME), *Boiler and Pressure Vessel Code*, leakage test for Oconee 3 because of a valve failure, it subsequently submitted Revision 1 of RR 04-ON-013 on February 17, 2005, to include Oconee 3. In an NRC safety evaluation dated April 14, 2006, RR 04-ON-013 was authorized for Oconee 1/2.

2.0 REGULATORY REQUIREMENTS

Inservice inspection (ISI) of the ASME Code Class 1, 2, and 3 components is performed in accordance with of the Section XI of the ASME Code and applicable addenda as required by Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.55a(g), except where specific relief has been granted by the NRC 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.

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) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The ASME Code of record for the Oconee 1/2/3 third interval 10-year ISI program, which ended on December 31, 2003, September 8, 2004, and January 1, 2005, for each plant respectively is the 1989 edition of Section XI of the ASME Code, with no addenda.

### 3.0 EVALUATION

#### Request for Relief No. 04-ON-013, Revision 1

##### Component Identification

Relief is requested for 1-inch nominal pipe size (NPS) portions of ASME Code Class 1 piping and components connected to the reactor coolant system (RCS) that are normally isolated from direct RCS pressure during normal operation. These areas are isolated from the RCS by their configuration between two normally closed valves that remain closed when the unit is in Modes 3, 2, or 1. This relief is requested for the third 10-year interval, which is now complete on all three units.

Four areas in Oconee 1 and four identical areas in Oconee 2 were inadvertently not pressure-tested during the performance of the ASME Code Class 1 third 10-year interval ISI pressure test. One area in Oconee 3 could not be pressurized because valve 3HP-492 malfunctioned and could not be safely opened during the ASME Code Class 1 test. These sections of pipe are identical configurations in each unit and are as follows:

- Section 1: 1" pipe between isolation valves HP-490 and HP-497 Oconee 1/2
- Section 2: 1" pipe between isolation valves HP-491 and HP-498 Oconee 1/2
- Section 3: 1" pipe between isolation valves HP-492 and HP-499 Oconee 1/2/3
- Section 4: 1" pipe between isolation valves HP-493 and HP-500 Oconee 1/2

##### ASME Code Requirements

ASME Code, Section XI, Table IWB-2500-1, Examination Category B-P, Pressure Retaining Components, System Hydrostatic Test, which applies to all Class 1 components within the system boundary.

This test is to be conducted once during the 10-year interval, either at or near the end of the interval.

ASME Code Case N-498-1, *Alternative Rules for 10-year system hydrostatic testing for Class 1, 2, and 3 systems, Section XI, Division 1* states:

It is the opinion of the ASME Code committee that as an alternative to the 10 year ISI system hydrostatic test required by ASME Code, Section XI, Table IWB-2500-1 Category B-P, the following rules shall be used:

- (1) A system leakage test (IWB-5221) shall be conducted at or near the end of each inspection interval, prior to reactor startup.

- (2) The boundary subject to test pressurization during the system leakage test shall extend to all ASME Code Class 1 pressure retaining components within the system boundary.
- (3) Prior to performing the VT-2 visual examination, the system shall be pressurized to nominal operating pressure for at least 4 hours for insulated systems and 10 minutes for non-insulated systems. The system shall be maintained at nominal operating pressure during the performance of the VT-2 visual examination.
- (4) The test temperatures and pressures shall not exceed limiting conditions for the hydrostatic test curve as contained in the plant Technical Specifications (TS).
- (5) The VT-2 visual examination shall include all components within the boundary identified in (2) above.
- (6) Test instrumentation requirements of IWA-5260 are not applicable.

[ASME Code, Section XI] IWB-5221 System Leakage Test

- (a) The system leakage test shall be conducted at a test pressure not less than the nominal operating pressure associated with 100% rated reactor power.
- (b) The system test pressure and temperature shall be attained at a rate in accordance with the heat-up limitations specified for the system.

The application of the above ASME Code requirements along with those of ASME Code Case N-498-1 would require all ASME Code Class 1 pressure-retaining components within the system boundary to be pressurized and VT-2 visually examined.

Relief is requested to defer the 10-year ISI interval pressure test on the four identified areas in Oconee 1/2, and on the one identified area in Oconee 3 from the end of the third 10-year ISI interval to the first refueling outage in the fourth 10-year ISI interval. Specifically, in accordance with the requirements of 10 CFR 50.55a(a)(3)(i), relief is requested from the requirements of the 1989 ASME Code, Section XI, Category B-P, Table IWB-2500-1, footnote (6). This footnote mandates performance of the 10-year ISI pressure test to be conducted at or near the end of each ISI interval.

Licensee's Proposed Alternative Examination and Basis for Relief Request

The four identified areas in Oconee 1/2 were inadvertently omitted from the ASME Code, Class 1, 10-year ISI pressure test performed in the third interval. The one identified area in Oconee 3 could not be pressurized because valve 3HP-492 could not be safely opened due to a malfunction. A task to repair or replace 3HP-492 was added to the schedule for the next Oconee 3 outage, 3EOC22 (spring 2006).

Per the requirements of the 1989 edition of the ASME Code, Section XI, Category B-P, Table IWB-2500-1, footnote (1), the identified areas have received a VT-2 visual exam each

refueling outage without being pressurized and have had no evidence of leakage. The next opportunity to pressurize these areas and perform a VT-2 visual exam will be during the next refueling outage in the fourth 10-year ISI interval. Therefore, the proposed alternative is that all these sections were pressure tested in accordance with the ASME Code (as modified by ASME Code Case N-498-1) requirements during the first refueling outage of the respective units fourth 10-year ISI interval.

If a leak had developed in any of these areas, it would have been detected by various means available to the operators. Area monitors would have alarmed if the radiation levels of the reactor building atmosphere had reached set limits.

Additionally, plant TS 3.4.13 requires that at least once every 72 hours, when above Mode 5, the RCS water inventory balance be performed. This TS limits the amount of unknown leakage to 1 gallon per minute (gpm). If this limit is exceeded, then the source must be identified or the reactor must be placed in Mode 3 within 12 hours and Mode 5 within 36 hours.

Besides the area radiation monitors and the RCS inventory monitoring, other leakage detection methods that were available included periodic pumping the reactor building normal sump.

Starting at Mode 3, during reactor shutdown for refueling outages, numerous inspections were made in the reactor building looking for indications of leakage. Each leak is evaluated and repaired.

#### Licensee's Proposed Implementation Schedule

Relief is requested to defer the 10-year ISI interval pressure test on the four identified areas in Oconee 1/2 and the one area on Oconee 3 from the end of the third 10-year ISI interval to the first refueling outage in each units' fourth 10-year ISI interval. The fourth 10-year ISI interval start date and first outage date of the fourth 10-year ISI interval for each unit are as follows:

Facility	Start Date of Fourth 10-year ISI Interval	First Outage Date of the Fourth 10-Year ISI Interval
Oconee 1	January 1, 2004	April 2005
Oconee 2	September 9, 2004	October 2005
Oconee 3	January 2, 2005	May 2006

#### Staff's Evaluation

The ASME Code, Section XI, Table IWB-2500-1, Examination Category B-P, Pressure Retaining Components, requires a system hydrostatic test of all ASME Code Class 1 components within the system boundary. This test is to be conducted once during each 10-year interval, either at or near the end of the interval. The licensee has invoked the use of ASME Code Case N-498-1 which allows a system leakage test to be conducted in lieu of a hydrostatic test at or near the end of each inspection interval, prior to reactor startup. Prior to performing the VT-2 visual examination, the system shall be pressurized to nominal operating pressure for at least 4 hours for insulated systems and 10 minutes for noninsulated systems. The system shall be maintained at nominal operating pressure during the performance of the VT-2 visual examination.

The licensee requested relief for portions of ASME Code Class 1 piping and components connected to the RCS that are normally isolated from direct RCS pressure during normal operation. These areas are isolated from the RCS by their configuration between two normally closed valves that remain closed when the particular unit is in Modes 3, 2, or 1. The four identified areas in Oconee 1/2 are: 1) the 1" pipe between isolation valves HP-490 and HP-497, 2) the 1" pipe between isolation valves HP-491 and HP-498, 3) the 1" pipe between isolation valves HP-492 and HP-499, and 4) the 1" pipe between isolation valves HP-493 and HP-500 of the RCS. For Oconee 3 the one identified area is the 1" pipe between isolation valves HP-492 and HP-499.

The subject four identified areas in Oconee 1/2 were inadvertently omitted from the Class 1, 10-year pressure test performed in the third interval. For Oconee 3 the line could not be pressurized because valve 3HP-492 could not be safely opened due to a malfunction. A task to repair or replace 3HP-492 was added to the schedule for 3EOC22 (May 2006).

The licensee proposed to defer the 10-year ISI interval pressure test on the four identified areas in Oconee 1/2, and the one area on Oconee 3 from the end of the third 10-year ISI interval to the first refueling outage in each units' fourth ISI interval. The fourth 10-year ISI interval start date and first outage date of the fourth 10-year ISI Interval for each unit is as follows:

Facility	Start Date of Fourth 10-year ISI Interval	First Outage Date of the Fourth 10-Year ISI Interval
Oconee 1	January 1, 2004	April 2005
Oconee 2	September 9, 2004	October 2005
Oconee 3	January 2, 2005	May 2006

The four subject areas in Oconee 1/2 and one area in Oconee 3 have received an ASME Code-required VT-2 visual exam each refueling outage during the third 10-year ISI interval including the last outage of the interval without being pressurized. During these examinations, the licensee has found no evidence of leakage such as boron residue or wet areas near the subject piping. The licensee noted that if a leak were to occur in any of the subject areas, it would be detected by various means available to the operators. There are area monitors that monitor the reactor building atmosphere and will alarm when the radiation levels reach set limits. In addition, at least once every 72 hours when the plant is above Mode 5, the plant TS 3.4.13 requires that the reactor coolant system water inventory balance is performed. The TS limits the amount of unknown leakage to 1 gpm. If this limit is exceeded, then the source must be identified or the reactor must be placed in Mode 3 within 12 hours and Mode 5 within 36 hours.

During reactor shutdown for refueling outages starting at Mode 3, the licensee performs a number of inspections in the reactor building looking for indications of leakage. The licensee evaluates each leak and repairs it. In addition to the area radiation monitors and water inventory monitoring, other leakage detection methods available include the frequency with which the reactor building normal sump has to be pumped. An increase in the frequency of pumping the normal sump would be an indication that there is a leak in the reactor building.

The staff has reviewed the licensee's proposed alternative and has determined that it provides reasonable assurance of quality and safety. The VT-2 visual examinations performed during

shutdown for each refueling outage, the various radiation and leakage monitoring equipment, and the TS requirement to perform a reactor coolant system water inventory balance every 72 hours provides confidence the subject piping areas are leak tight and structurally sound.

#### 4.0 CONCLUSIONS

For Relief Request No. 04-ON-013, the staff concluded that the licensee's proposed alternative provides reasonable assurance of quality and safety. The NRC staff further concludes that the VT-2 visual examinations performed during reactor shutdown for each refueling outage of the third 10-year ISI interval, the various radiation and leakage monitoring equipment, and the TS requirement to perform a reactor coolant system water inventory balance every 72 hours provides confidence that the subject piping areas are leak tight and structurally sound. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year ISI interval at Oconee 1/2/3.

All other requirements of the ASME Code, Section XI for which relief has not been specifically requested remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: T. McLellan

Date: July 11, 2006

Oconee Nuclear Station, Units 1, 2, and 3

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