

January 3, 2006

Mr. H. L. Sumner, Jr.  
Vice President - Nuclear  
Hatch Project  
Southern Nuclear Operating  
Company, Inc.  
P.O. Box 1295  
Birmingham, AL 35201-1295

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT, UNIT NOS 1 AND 2 (HATCH), REQUEST FOR RELIEF FROM THE REQUIREMENTS OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME), *BOILER AND PRESSURE VESSEL CODE* (CODE) (TAC NOS. MC6528 AND MC6529).

Dear Mr. Sumner:

By letter dated March 30, 2005, as supplemented by letters dated August 3, October 5, and October 24, 2005, Southern Nuclear Operating Company, Inc. (the licensee), submitted a proposed request for relief, ISI-ALT-1, for Hatch. The licensee proposed an alternative to the ASME Code requirements. Specifically, the licensee proposed using ASME Code, Section XI, Appendix VIII, Supplements 4 and 6, qualified procedures and personnel, and the criteria from Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.55a applicable to the examination of the reactor pressure vessel (RPV) shell-to-flange and RPV head-to-flange welds. The letter dated October 24, 2005, included Version 4.0 of the relief request and superseded the letters dated March 30, August 3, and October 5, 2005, for relief request ISI-ALT-1. The request is for the fourth 10-year inservice inspection interval.

The Nuclear Regulatory Commission (NRC) staff found the proposed alternative, ISI-ALT-1, Version 4.0, acceptable in accordance with 10 CFR 50.55a(a)(3)(I) because the licensee's proposed alternative provides an acceptable level of quality and safety. The NRC staff authorizes the proposed alternative for the fourth 10-year inservice inspection interval for Hatch.

The NRC staff's safety evaluation is enclosed.

Sincerely,

**/RA/**

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

Docket Nos. 50-321 and 50-366

Enclosure: Safety Evaluation

cc w/encl: See next page

January 3, 2006

Mr. H. L. Sumner, Jr.  
Vice President - Nuclear  
Hatch Project  
Southern Nuclear Operating  
Company, Inc.  
P.O. Box 1295  
Birmingham, AL 35201-1295

SUBJECT: EDWIN I. HATCH NUCLEAR PLANT, UNIT NOS 1 AND 2 (HATCH), REQUEST FOR RELIEF FROM THE REQUIREMENTS OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME), *BOILER AND PRESSURE VESSEL CODE* (CODE) (TAC NOS. MC6528 AND MC6529).

Dear Mr. Sumner:

By letter dated March 30, 2005, as supplemented by letters dated August 3, October 5, and October 24, 2005, Southern Nuclear Operating Company, Inc. (the licensee), submitted a proposed request for relief, ISI-ALT-1, for Hatch. The licensee proposed an alternative to the ASME Code requirements. Specifically, the licensee proposed using ASME Code, Section XI, Appendix VIII, Supplements 4 and 6, qualified procedures and personnel, and the criteria from Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.55a applicable to the examination of the reactor pressure vessel (RPV) shell-to-flange and RPV head-to-flange welds. The letter dated October 24, 2005, included Version 4.0 of the relief request and superceded the letters dated March 30, August 3, and October 5, 2005, for relief request ISI-ALT-1. The request is for the fourth 10-year inservice inspection interval.

The Nuclear Regulatory Commission (NRC) staff found the proposed alternative, ISI-ALT-1, Version 4.0, acceptable in accordance with 10 CFR 50.55a(a)(3)(I) because the licensee's proposed alternative provides an acceptable level of quality and safety. The NRC staff authorizes the proposed alternative for the fourth 10-year inservice inspection interval for Hatch.

The NRC staff's safety evaluation is enclosed.

Sincerely,

/RA/

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

Docket Nos. 50-321 and 50-366

Enclosure: Safety Evaluation

cc w/encl: See next page

DISTRIBUTION:

Public	RidsOgcRp	LPL2-1Reading	DNaujock	
RidsAcrsAcnwMailCenter	RidsNrrLAMO'Brien	BWetzel, EDO RII	RidsNrrPMGratton	
RidsAcrsRgn2MailCenter(MWidmann)		RidsNrrDorILplc(EMarinos)	RidsNrrDciCpnb(TChan)	RidsNrrDpr
Accession No. ML053470091				NRR_028

OFFICE	NRR/LPL2-1/PM	NRR/LPL2-1/LA	NRR/CPNB/BC	OGC	NRR/LPL2-1/BC
NAME	CGratton:kg	MO'Brien	TChan	S. Hamrick	EMarinos
DATE	12/22/05	01/03/06	SE dated 12/12/05	12/16/05	01/03/06

OFFICIAL RECORD COPY

# SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

## RELIEF REQUEST ISI-ALT-1, VERSION 4.0

### SOUTHERN NUCLEAR OPERATING COMPANY, INC.

#### EDWIN I. HATCH NUCLEAR PLANT, UNIT NOS. 1 AND 2 (HATCH)

#### DOCKET NOS. 50-321 AND 50-366

## 1.0 INTRODUCTION

By letter dated March 30, 2005, as supplemented by letters dated August 3, October 5, and October 24, 2005, Southern Nuclear Operating Company, Inc. (the licensee) submitted a request for relief, ISI-ALT-1, for Hatch. The licensee proposed an alternative to the requirements of the American Society of Mechanical Engineers (ASME), *Boiler and Pressure Vessel Code* (Code). Specifically, the licensee proposed using ASME Code, Section XI, Appendix VIII, Supplements 4 and 6 qualified procedures and personnel, and the criteria from the Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.55a that are applicable to the examination of the reactor pressure vessel (RPV) shell-to-flange and RPV head-to-flange welds. The letter dated October 24, 2005, included Version 4.0 of the relief request and superceded the letters dated March 30, August 3, and October 5, 2005, for relief request ISI-ALT-1. The request is for the fourth 10-year inservice inspection (ISI) interval which begins January 1, 2006, and ends December 31, 2015.

## 2.0 REGULATORY REQUIREMENTS

The ISI of ASME Code Class 1, Class 2, and Class 3 components will be performed in accordance with Section XI of the ASME Code and applicable edition and addenda as required by 10 CFR 50.55a(g), 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 in part that alternatives to the requirements of paragraph (g) may be used, when authorized by the Nuclear Regulatory Commission (NRC), if the licensee demonstrates that: (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, Class 2, and Class 3 components (including supports) will meet the requirements, except the design and access provisions and the preservice 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 ISI 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 Hatch for the fourth 10-year ISI interval is the 2001 edition through the 2003 addenda of the ASME Code. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein and subject to Commission approval.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Component for Which Relief is Requested

The applicable vessel welds are ASME Code Class 1, Category B-A pressure retaining welds in the RPV, Item No. B1.30, shell-to-flange weld, and Item No. B1.40, head-to-flange weld.

#### 3.2 Applicable ASME Code Requirements

The applicable requirement is the 2001 edition through the 2003 addenda of Section XI of the ASME Code, Appendix I, I-2120, which states that vessels greater than 2 inches in thickness shall be examined in accordance with Section V, Article 4, as supplemented by Table I-2000-1.

#### 3.3 Licensee's Proposed Alternative

The licensee proposed performing ultrasonic test (UT) examinations of the subject welds in accordance with the 2001 edition with the 2003 addenda of ASME Code, Section XI, with the modifications and limitations listed in the 10 CFR 50.55a. The licensee will use personnel and procedures qualified to the 2001 edition with no addenda, Section XI, Appendix VIII, Supplement 4, "Qualification Requirements for the Clad/Base Metal Interface of Reactor Vessel," and Supplement 6, "Qualification Requirements for Reactor Vessel Welds other than Clad/Base Metal Interface," as administered by the Energy Power Research Institute - Performance Demonstration Initiative (PDI) Program.

#### 3.4 Licensee's Basis for Relief

Appendix VIII requirements were developed with a rigorous, item-specific performance demonstration to ensure the effectiveness of UT examinations. The performance demonstration administered by PDI was conducted on RPV mockups containing flaws of various size and allocations. The demonstration established the capability of equipment, procedures, and personnel to find flaws that could be detrimental to the integrity of the RPV. The performance demonstration showed that for the detection of flaws in RPV welds, the UT techniques were equal to or surpassed the requirements of the Section V, Article 4 of the ASME Code. Additionally, the PDI qualified sizing techniques are considered to be more accurate than the techniques used in Section V, Article 4.

Although Appendix VIII is not required for the RPV shell-to-flange and RPV head-to-flange welds, the use of Appendix VIII, Supplements 4 and 6 criteria for detection of flaws in these welds will be equal to or will exceed the requirements established by Section V, Article 4.

### 3.5 NRC Staff Evaluation

The 2001 edition, 2003 addenda of ASME Code, Section XI, IWA-2232 states, "Ultrasonic examination shall be conducted in accordance with Appendix I." Subarticle I-2120 states that vessels greater than 2 inches in thickness shall be examined in accordance with Section V, Article 4, as supplemented by Table I-2000-1. Section V, Article 4 provides a prescriptive-based process for qualifying UT of procedures and the scanning requirements for examinations. The prescriptive-based UT uses detailed criteria for setting up and calibrating equipment, calculating coverage, and detecting indications. The capability of a prescriptive-based UT examination is demonstrated with calibration blocks made from representative material containing holes and notches. Performance-based UT requires that detailed criteria be used for performance demonstration tests. The results for the tests are compared against statistically developed screening criteria. The tests are performed on representative mockups containing flaws similar to those found in operating plants. The performance-based tests demonstrate the effectiveness of UT personnel and procedures.

In lieu of Subarticle I-2120, the licensee proposed performing UT examinations of the subject welds in accordance with the 2001 edition, 2003 addenda of ASME Code, Section XI, Appendix VIII, Supplements 4 and 6, as modified by 10 CFR 50.55a. Section 50.55a limits the use of Appendix VIII to the 2001 edition with no addenda. Appendix VIII is a performance-based UT method. Examinations are performed with the scanning requirements for Supplements 4 and 6 that are provided in 10 CFR 50.55a(b)(2)(xv)(G), and the scanning volume identified in the ASME Code, Section XI, Figure IWB-2500-4 for the shell-to-flange weld and Figure IWB-2500-5 for the head-to-flange weld. The scanning requirements are: (1) for the examination of the inner 15 percent through-wall volume, scanning will be performed in four orthogonal directions to the maximum extent possible with procedures and personnel qualified to Appendix VIII, Supplement 4; (2) the remainder of the inner 15 percent through-wall volume is considered fully examined if coverage is obtained in at least one parallel and one perpendicular direction using personnel and procedures qualified for single side examination in accordance with Supplement 6; and (3) the remaining 85 percent through-wall volume is considered fully examined if coverage is obtained in one parallel and one perpendicular direction using procedures and personnel qualified for single side examination. Single side qualification criteria are provided in 10 CFR 50.55a(b)(2)(xv)(G)(2) and 10 CFR 50.55a(b)(2)(xvi).

The licensee will follow 10 CFR 50.55a(b)(2)(xv)(G) for the vessel-to-flange and head-to-flange welds. Because the head-to-flange weld has no cladding, the licensee will use Code Case N-664, "Performance Demonstration Requirements for Examination of Unclad Reactor Pressure Vessel Welds, Excluding Flange Welds," that permits using Appendix VIII, Supplement 4 in lieu of the requirements of Appendix VIII, Supplement 6 for the inner 10 percent performance demonstration. Code Case N-664 is endorsed in Regulatory Guide, 1.147, Revision 14, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1." There are no specific performance demonstration requirements from 10 percent through 15 percent through-wall thickness. The scanning of the unclad head-to-flange weld would be applied according to the requirements of 10 CFR 50.55a(b)(2)(xv)(G).

The procedures, equipment, and personnel qualified to Appendix VIII through the PDI program have shown a high probability of flaw detection, and have increased the reliability of

examinations of weld configurations within the scope of the PDI program. Therefore, the proposed alternative will provide an acceptable level of quality and safety.

#### 4.0 Conclusion

Based on the above evaluation, the NRC staff concludes that the licensee's proposed alternative, ISI-ALT-1, Version 4.0, to use the 2001 edition of the ASME Code, Section XI, Appendix VIII, Supplements 4 and 6 as modified by 10 CFR 50.55a(b)(2)(xv) and 10 CFR 50.55a(b)(2)(xvi) for the RPV shell-to-flange and head-to-flange welds will provide an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the proposed alternative is authorized for Hatch for the fourth 10-year inservice inspection interval.

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

Principal Contributor: Donald Naujock, NRR

Date: January 3, 2006

Edwin I. Hatch Nuclear Plant, Units 1 & 2

cc:

Laurence Bergen  
Oglethorpe Power Corporation  
2100 E. Exchange Place  
P.O. Box 1349  
Tucker, GA 30085-1349

Mr. R.D. Baker  
Manager - Licensing  
Southern Nuclear Operating Company, Inc.  
P.O. Box 1295  
Birmingham, AL 35201-1295

Resident Inspector  
Plant Hatch  
11030 Hatch Parkway N.  
Baxley, GA 31531

Harold Reheis, Director  
Department of Natural Resources  
205 Butler Street, SE., Suite 1252  
Atlanta, GA 30334

Steven M. Jackson  
Senior Engineer - Power Supply  
Municipal Electric Authority of Georgia  
1470 Riveredge Parkway, NW  
Atlanta, GA 30328-4684

Mr. Reece McAlister  
Executive Secretary  
Georgia Public Service Commission  
244 Washington St., SW  
Atlanta, GA 30334

Arthur H. Domby, Esq.  
Troutman Sanders  
Nations Bank Plaza  
600 Peachtree St, NE, Suite 5200  
Atlanta, GA 30308-2216

Chairman  
Appling County Commissioners  
County Courthouse  
Baxley, GA 31513

Mr. Jeffrey T. Gasser  
Executive Vice President  
Southern Nuclear Operating Company, Inc.  
P.O. Box 1295  
Birmingham, AL 35201-1295

Mr. G. R. Frederick, General Manager  
Edwin I. Hatch Nuclear Plant  
Southern Nuclear Operating Company, Inc.  
U.S. Highway 1 North  
P.O. Box 2010  
Baxley, GA 31515

Mr. K. Rosanski  
Resident Manager  
Oglethorpe Power Corporation  
Edwin I. Hatch Nuclear Plant  
P.O. Box 2010  
Baxley, GA 31515