November 21, 2000

Mr. H. L. Sumner, Jr.
Vice President - Nuclear
Hatch Project
Southern Nuclear Operating
Company, Inc.
Post Office Box 1295
Birmingham, Alabama 35201-1295

SUBJECT: SAFETY EVALUATION FOR EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2, REQUEST FOR RELIEF NOS. RR-32 AND RR-33, (TAC NOS. MA9277 AND MA9278)

Dear Mr. Sumner:

We have completed our review of your submittal dated July 31, 2000, which requested relief from certain American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code inservice inspection requirements associated with the implementation of Appendix VIII to Section XI of the ASME Code at Edwin I. Hatch Nuclear Plant, Units 1 and 2. As discussed in the enclosed evaluation, we have found the request for relief RR-32 unacceptable and the request for relief RR-33 acceptable.

Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50a(a)(3)(i), we have authorized the alternate proposed in RR-33. We have concluded that this alternate, to use Code Case N-583 in conjunction with 10 CFR 50.55a(b)(2)(xiv) will provide an acceptable level of quality and safety for the annual training of personnel who conduct ultrasonic testing.

Also, included in your submittal was a request for relief RR-Appendix VIII-1, which we authorized in a letter dated September 14, 2000.

Sincerely,

/RA/

Richard L. Emch, Jr., Chief, Section 1
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-321 and 50-366

Enclosure: As stated

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

THIRD TEN-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN

REQUEST FOR RELIEF NOS. RR-32 AND RR-33

SOUTHERN NUCLEAR OPERATING COMPANY, INC.

EDWIN I. HATCH NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-321 AND 50-366

1.0 INTRODUCTION

The inservice inspection (ISI) of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel 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 Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states in part that alternatives to the requirements of paragraph (g) may be used, when authorized by the 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, 2, and 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 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) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The inservice inspection code of record for Edwin I. Hatch Nuclear Plant, Units 1 and 2 (Hatch), third 10-year interval is the 1989 Edition 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.

By letter dated July 31, 2000, Southern Nuclear Operating Company, Inc. (the licensee), requested relief from certain ultrasonic testing (UT) requirements pertaining to the examination of Class 1 reactor pressure vessel (RPV) nozzle-to-vessel welds and annual UT training requirements for the third 10-year ISI intervals at Hatch, Units 1 and 2. For relief request RR-32, the licensee proposed using Code Case N-613 as an alternative to the examination volume and scan directions requirements in the ASME Code. For relief request RR-33, the licensee proposed using Code Case N-583 in conjunction with 10 CFR 50.55a(b)(2)(xiv) as an alternative for the annual training requirements in the ASME Code.

2.0 RR-32, RPV NOZZLE-TO-VESSEL WELDS

This request is applicable to Class 1, RPV pressure-retaining nozzle-to-vessel welds, Section XI of the ASME Code, Table-IWB 2500-1, Category B-D, Item B3.90 and Figure IWB-2500-7(b)

2.1 Code Requirements for which Relief is Requested

Pursuant to 10 CFR 50.55a(a)(3)(i), the licensee is requesting relief from the RPV nozzle-to-vessel weld requirements in Table-IWB 2500-1, Examination Category B-D, Item B3.90, of the 1989 Edition of Section XI of the ASME Code, the weld configuration and examination volume illustrated in Figure IWB-2500-7 (b), and the examination requirements in Section V of the Code, Article 4.

2.2 Licensee's Proposed Alternative to Code

The proposed alternative is to perform nozzle-to-vessel weld examinations by scanning for reflectors oriented parallel to the weld in accordance with ASME Section XI Code Case (CC) N-613, "Ultrasonic Examination of Full Penetration Nozzles in Vessels, Examination Category B-D, Items Nos. B3.10 and B3.90, Reactor Vessel-to-Nozzle Welds, Fig. IWB-2500-7(a), (b), and (c) Section XI, Division 1." The request for relief RR-32 is for the third 10-year inspection interval.

2.3 Evaluation

The licensee states that RPV nozzle-to-vessel weld volumes will be examined according to CC N-613. CC N-613 requirements differ from those of the ASME Code with respect to examination volume and examination scanning directions. CC N-613 has not been endorsed by the NRC in Regulatory Guide 1.147. The staff review of CC N-613 as applied by the licensee can be addressed in three separate parts.

The first part of CC N-613 addresses the area next to the weld that must be volumetrically examined. The CC reduces the examination volume adjacent to the widest part of the weld from half of the vessel wall thickness to one-half inch. The acceptability of reduced volume examinations is based on prior examinations of the base metal and internal stress distribution near the weld. Although the CC does not specifically impose prior examination results of the excluded volume area as a condition for its use, the base metal was extensively examined during construction, preservice inspection, and ISIs. These examinations show the ASME Code volume to be free of flaws. The creation of flaws during plant service in the volume excluded from examination by the CC is unlikely because of the low stress in the base metal

away from the weld. The stresses caused by welding are concentrated at and near the weld. Cracks, should they initiate, will occur in the high-stressed area of the weld. The high stressed areas are within the volume included in the CC for examination. The licensee has performed prior examinations of the subject welds which supports this aspect of CC N-613.

The second part of the CC identifies a criterion for conducting the examination. The criterion states that nozzle examinations may be conducted using techniques designed for detection and sizing of surface and subsurface flaws. The phrase "techniques designed for" does not satisfy, the 10 CFR 50.55a(a)(3) criterion which states, in part, that an applicant proposing an alternative must demonstrate that the proposed alternative would provide an acceptable level of quality and safety. One of the staff's concerns is in regard to an adequate demonstration under the criterion; the NRC has determined that CC N-613 may be considered only if the UT technique is qualified with an approved performance demonstration. For instance, a UT technique qualified using the performance-based methodology contained in Supplement 7 to Appendix VIII of Section XI of the Code would satisfy the demonstration requirement. Supplement 7 to Appendix VIII becomes mandatory for RPV nozzle-to-vessel weld examinations on November 22, 2002. The licensee does not address performance demonstration in its proposed alternative.

The third part of CC N-613 pertains to coverage. Coverage is the sum of the volume examined from the required scan directions. Code requires scanning for flaws in the axial and circumferential directions. The CC eliminates scanning for flaws in the circumferential directions which is contrary to the coverage requirements of Supplement 7, "Qualification Requirements for Nozzle-to-Vessel Welds," to Appendix VIII. These coverage requirements for which the licensee is seeking relief are contained in 10 CFR 50.55a(b)(2)(xv)(K)(2) and (3) and become mandatory November 22, 2002. The coverage requirements emphasize ultrasonic examination of the weld volume at the weld root for circumferential and radial flaws by scanning in four orthogonal directions and de-emphasize ultrasonic examination of the remaining weld volume. Since the staff continues to support the coverage requirements of the rule, the weld root coverage specified in CC N-613, which is in conflict with the coverage requirements of the rule, is not acceptable.

2.4 Conclusion

Based on the above evaluation, the staff concludes that the licensee has not demonstrated that the use of CC N-613 will provide an acceptable level of quality and safety. Therefore, the licensee's request to use CC N-613 in lieu of ASME Code requirements is denied.

3.0 RR-33, ANNUAL UT RETRAINING

All components subject to UT examination.

3.1 ASME Code Requirements for which Relief is Requested

Pursuant to 10 CFR 50.55a(a)(3)(i), the licensee is requesting relief from the 1995 Edition with 1996 Addenda, Appendix VII to Section XI of the ASME Code, Subsubarticle VII-4240 for Appendix VIII qualified UT personnel, and the 1989 Edition of Appendix VII to Section XI, Subsubarticle VII-4240 for non-Appendix VIII qualified UT personnel. Subsubarticle VII-4240

requires a minimum of 10 hours of annual UT training. The request for relief RR-33 is for the third 10-year inservice inspection interval.

3.2 Licensee-Proposed Alternative to ASME Code

The licensee-proposed alternative is to conduct annual UT training in accordance ASME Section XI CC N-583, "Annual Training Alternative, Section XI, Division 1," in conjunction with 10 CFR 50.55a(b)(2)(xiv) in lieu of Subsubarticle VII-4240.

3.3 Evaluation

The proposed alternative is to conduct annual UT training in accordance with ASME CC N-583 in conjunction with 10 CFR 50.55a(b)(2)(xiv) in lieu of the Subsubarticle VII-4240 to Appendix VII of Section XI of the ASME Code, all editions, for personnel certified to perform UT examinations. CC N-583 has not been endorsed by the NRC in Regulatory Guide 1.147. The annual training requirements in CC N-583 are for all UT personnel to perform 8 hours of practice examining or analyzing material or welds containing flaws similar to those encountered in the field. 10 CFR 50.55a(b)(2)(xiv) specifies annual training requirements for UT personnel qualified to perform Appendix VIII to Section XI of the ASME Code examinations. These requirements are 8 hours of hands-on training with flawed specimens containing cracks that must be performed no earlier than 6 months prior to performing examinations at a licensee's facility. By connecting the annual training requirements of 10 CFR 50.55a(b)(2)(xiv) to CC N-583, the licensee is proposing to follow the requirements in 10 CFR 50.55a(b)(2)(xiv) for all UT personnel as an alternative to Subsubarticle VII-4240.

Subsubarticle VII-4240, Appendix VII of Section XI of the ASME Code requires 10 hours of annual training to impart knowledge of new developments, material failure modes, and any pertinent technical topics as determined by the licensee. No hands-on training or practice is required to be included in the 10 hours of training. This training is required of all UT personnel qualified to perform examinations of ASME Code Class 1, 2, and 3 systems.

As part of the staff's rulemaking effort to revise 10 CFR 50.55a(b)(2), the issue of UT annual training requirements was reviewed. This review was included in the summary of comments to the rule 64 *FR* 51370. In the review, the staff determined that the 10 hours of annual training requirement specified in the ASME Code was inadequate for two reasons. The first reason was that the training does not require practice with flawed specimens. Practice with flaws is necessary to maintain familiarity with signals that can be difficult to interpret. The second reason is related to the length of training and its frequency. Studies have shown that an examiner's capability begins to diminish within 6 months if skills are not maintained. Therefore, examiners must practice on a frequent basis to maintain their capability for proper interpretation of flaws.

Based on resolution of public comments for the above rulemaking, the staff accepted an industry initiative advanced by the Electric Power Research Institute which proposed 8 hours of hands-on practice with flawed specimens containing cracks. The practice would occur no earlier than 6 months prior to performing examinations at a licensee's facility. The initiative was adopted in 10 CFR 50.55a(b)(2)(xiv) for personnel maintaining their Appendix VIII qualifications.

10 CFR 50.55a(b)(2)(xiv) is independent of Subsubarticle VII-4240 requirements. This independence imposes two sets of requirements for annual training. The licensee would, therefore, have to either maintain two separate programs or show how these separate requirements are being fulfilled. Each program has the same objective, which is to maintain the skills of their UT personnel. The staff believes that the skills of UT personnel are adequately maintained with10 CFR 50.55a(b)(2)(xiv). Therefore, the requirements of CC N-583 in conjunction with10 CFR 50.55a(b)(2)(xiv) in lieu of Subsubarticle VII-4240 will provide an acceptable level of quality and safety.

4.0 CONCLUSION

Based on the discussion above, the staff has concluded that the proposed alternative to use CC N-583 in conjunction 10 CFR 50.55a(b)(2)(xiv) will provide an acceptable level of quality and safety for annual training of UT personnel. However, CC N-583 has not been endorsed by the NRC in 10 CFR 50.55a. Pursuant to 10 CFR 50.55a(a)(3)(i), the use of the proposed alternative RR-33 is authorized until such time as the code case is published in a future version of 10 CFR 50.55a. At that time, if the licensee intends to continue implementing this code case, it must follow all provisions of CC N–583 with limitations or conditions specified in 10 CFR 50.55a, if any, and in conjunction with 10 CFR 50.55a(b)(2)(xiv).

The staff has also concluded that the request for relief RR-32 is unacceptable.

Principal Contributor: D. Naujock

Date: November 21, 2000

cc:
Mr. Ernest L. Blake, Jr.
Shaw, Pittman, Potts
and Trowbridge
2300 N Street, NW.
Washington, DC 20037

Mr. D. M. Crowe
Manager, Licensing
Southern Nuclear Operating
Company, Inc.
P. O. Box 1295
Birmingham, Alabama 35201-1295

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

Mr. Charles H. Badger
Office of Planning and Budget
Room 610
270 Washington Street, SW.
Atlanta, Georgia 30334

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

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

Charles A. Patrizia, Esquire
Paul, Hastings, Janofsky & Walker
10th Floor
1299 Pennsylvania Avenue
Washington, DC 20004-9500

Chairman
Appling County Commissioners
County Courthouse
Baxley, Georgia 31513

Mr. J. D. Woodard
Executive Vice President
Southern Nuclear Operating
Company, Inc.
P. O. Box 1295
Birmingham, Alabama 35201-1295

Mr. P. W. Wells
General Manager, Edwin I. Hatch
Nuclear Plant
Southern Nuclear Operating
Company, Inc.
U.S. Highway 1 North
P. O. Box 2010
Baxley, Georgia 31515

Mr. L. M. Bergen
Resident Manager
Oglethorpe Power Corporation
Edwin I. Hatch Nuclear Plant
P. O. Box 2010
Baxley, Georgia 31515