

January 9, 2003

Mr. J. A. Scalice
Chief Nuclear Officer and
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SUBJECT: WATTS BAR NUCLEAR PLANT, UNIT 1 — EVALUATION OF AMERICAN
SOCIETY OF MECHANICAL ENGINEERS (ASME) INSERVICE INSPECTION
(ISI) PROGRAM REQUEST FOR RELIEF 1-ISI-13 (TAC NO. MB5693)

Dear Mr. Scalice:

Tennessee Valley Authority's (TVA's) letter of June 27, 2002, requested relief from ASME Section XI Code-required examinations because TVA could not achieve full inspection coverage due to limitations which were identified in the Unit 1, Cycle 4 refueling outage. TVA submitted this relief request, concerning examination of the reactor vessel head-to-flange weld, in accordance with 10 CFR 50.55a(g)(5)(iii).

The U.S. Nuclear Regulatory Commission staff, has reviewed and evaluated the relief request. Based on the information provided by TVA, the staff concludes that the request for relief is acceptable. Therefore, TVA's Relief Request No. 1-ISI-13 is granted pursuant to Title 10, *Code of Federal Regulations*, Section 50.55a(g)(6)(i), for the first 10-year ISI interval on the basis that the full inspection required by the Code is impractical and the examinations performed provide reasonable assurance of structural integrity of the subject welds.

A copy of our safety evaluation is enclosed.

Sincerely,

/RA/

Allen G. Howe, Chief, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-390

Enclosure: Safety Evaluation

cc w/enclosure: See next page

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WATTS BAR NUCLEAR PLANT

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
FIRST 10-YEAR INTERVAL INSERVICE INSPECTION
REQUEST FOR RELIEF NO. 1-ISI-13
WATTS BAR NUCLEAR PLANT, UNIT 1
TENNESSEE VALLEY AUTHORITY
DOCKET NUMBER 50-390

1.0 INTRODUCTION

Tennessee Valley Authority's (TVA's) letter of June 27, 2002, requested relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, "Rules for Inservice Inspection (ISI) of Nuclear Power Plant Components." TVA requested relief from the Code-required examinations because it could not achieve full inspection coverage of the reactor vessel head-to-flange weld due to limitations which were identified in the Unit 1, Cycle 4 refueling outage. TVA submitted this relief request in accordance with Title 10, Code of Federal Regulations (10 CFR), Section 50.55a(g)(5)(iii).

2.0 REGULATORY EVALUATION

Inservice inspection of ASME Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME B&PV Code and applicable addenda as required by 10 CFR 50.55a(g), except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). As stated in 10 CFR 50.55a(a)(3), alternatives to the requirements of paragraph (g) may be used, when authorized by the U.S. 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, 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, 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 1989 Edition of the ASME Code, Section XI, is the Code of record for the Watts Bar Nuclear Plant, Unit 1, first 10-year ISI interval.

3.0 TECHNICAL EVALUATION

Code Requirement: ASME Section XI, 1989 Edition, Table IWB-2500-1, Examination Category B-A, Item Number B1.40, examination requirement as defined by Figure IWB-2500-5.

Licensee's Code Relief Request: In accordance with 10 CFR 50.55a(g)(5)(iii), TVA requested relief from performing Code-required volumetric examination of essentially 100% of the full volume of the reactor vessel head-to-flange weld.

Licensee's Basis for Relief Request: (as stated):

The design configuration of the reactor vessel head-to-flange weld precludes an ultrasonic examination of the required volume for the head-to-flange weld. The design configuration limits ultrasonic examination of the code required examination volume to approximately 75%. This percentage is calculated in accordance with TVA Procedure N-GP-28, Calculation of ASME Code Coverage for Section XI NDE [nondestructive examination] Examinations.

Licensee's Proposed Alternative Examination: (as stated):

The code required volumetric examination of the full volume of the reactor vessel head-to-flange weld will be performed on accessible areas to the extent practical given the design configuration of the head-to-flange weld. The code required surface examination will be performed on 100% of the weld length for this weld.

To meet the Inspection Program B minimum/maximum examination requirements for Examination Category B-A as defined in ASME Section XI, IWB-2412, the head-to-flange weld is divided into two sections. One section, W08-09-A, was scheduled for examination during the first period and was examined during the Cycle 2 refueling outage. The other section, W08-09-B, was scheduled for examination during the second period and was examined during the Cycle 4 refueling outage . . . Request for relief 1-ISI-06 was submitted for weld W08-09-A after examination during the Cycle 2 refueling outage. The request for relief was granted pursuant to 10 CFR 50.55a(g)(6)(i) by NRC letter "Watts Bar Nuclear Plant - First 10 Year Interval Inservice Inspection Program Plan Requests for Relief Nos. 1-ISI-5 and 1-ISI-6 (TAC No. MA6446)," dated March 24, 2000.

Staff Evaluation:

ASME Code, Section XI, Examination Category B-A, Item B1.40, requires 100-percent surface and volumetric examination, as defined by Figure IWB-2500-5, for reactor vessel head-to-flange welds. TVA requested relief from the Code-required volumetric examination for reactor vessel head-to-flange weld W08-09-B pursuant to 10 CFR 50.55a(g)(5)(iii). The complete circumferential reactor vessel head-to-flange weld is identified by two weld identifier numbers, W08-09-A and W08-09-B, as described above. TVA inspected weld W08-09-B during the second ISI-inspection interval. However, the geometric curvature of the flange, in combination with restrictions caused by O-ring grooves and locations for recessed O-ring clips limit complete ultrasonic scans of the full volume of this weld. Therefore, the Code-required 100-percent volumetric examination of weld W08-09-B is impractical. To gain access for 100-percent coverage, the component would have to be redesigned and modified. Thus, imposing the Code requirements would be a significant burden on TVA.

TVA was able to achieve 75 percent of the required volumetric examination coverage. In addition, TVA completed the Code-required 100-percent surface examination. TVA said in the

summary section of the Watts Bar, Unit 1, ASME Section XI ISI Summary Report for the Fourth Refueling Cycle (see TVA's letter of May 2, 2002), that "the results of all the examinations met the applicable acceptance standards." Therefore, these examinations provide reasonable assurance of the structural integrity of weld W08-09-B. Accordingly, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

3.0 CONCLUSION

The staff evaluated TVA's submittal and concludes that the Code-required 100-percent volumetric examination of weld W08-09-B is impractical and the examinations performed provide reasonable assurance of structural integrity of the subject welds. Therefore, Request for Relief No. 1-ISI-13 is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the first 10-year ISI interval. The NRC staff has determined that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law and will not endanger life or property, or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

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Date: January 9, 2003