UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION OF THE SECOND TEN YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN REQUESTS FOR RELIEF FOR DUKE POWER COMPANY OCONEE NUCLEAR STATION, UNIT 3 DOCKET NO. 50-287

1.0 INTRODUCTION

The Technical Specifications for Oconee Nuclear Station, Unit 3, state that the inservice inspection of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by Title 10 of the Code of Federal Regulations (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 10 CFR 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 difficulties 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 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) on the date 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable edition of Section XI of the ASME Code for the Oconee Nuclear Station, Unit 3, second 10-year inservice inspection (ISI) interval is the 1980 Edition through Winter 1980 Addenda. 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.

Pursuant to 10 CFR 50.55a(g)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for its facility, information shall be submitted to the Commission in support of that determination and a request made for relief from the ASME

Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), the Commission may grant relief and may impose alternative requirements that are determined to be authorized by law, will not endanger life, property, or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed. In a letter dated November 10, 1993, Duke Power Company submitted to the NRC its second ten-year interval inservice inspection program plan Requests for Relief Nos. 92-02, 93-04, 93-05, and 93-06, for the Oconee Nuclear Station, Unit 3.

2.0 EVALUATION AND CONCLUSIONS

The staff, with technical assistance from its contractor, the Idaho National Engineering Laboratory (INEL), has evaluated the information provided by the licensee in support of its second 10-year interval inservice inspection program plan Requests for Relief Nos 92-02, 93-04, 93-05, and 93-06, for Oconee Nuclear Station, Unit 3. Based on the information submitted, the staff adopts the contractor's conclusions and recommendations presented in the Technical Evaluation Letter Report attached. Request for Relief No. 93-04, is granted pursuant to 10 CFR 50.55a(g)(6)(i) in that the Code requirements are impractical. This relief is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest, given due consideration to the burden that could result if the requirements were imposed on the licnesee. The alternatives contained in Requests for Relief Nos. 93-02, 93-05, and 93-06, are authorized pursuant to 10 CFR 50.55a(a)(3)(ii) in that compliance with the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. This alternative contained in No. 93-02 is authorized for the second 10-year ISI interval only.

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Date: January 31, 1995

TECHNICAL EVALUATION LETTER REPORT
ON THE SECOND TEN-YEAR INTERVAL INSERVICE INSPECTION
REQUESTS FOR RELIEF
FOR
DUKE POWER COMPANY
OCONEE NUCLEAR STATION, UNIT 3
DOCKET NUMBER: 50-287

1.0 INTRODUCTION

By letter dated November 10, 1993 the licensee, Duke Power Company, submitted Requests for Relief Nos. 93-02, 93-04, 93-05, and 93-06, requesting relief from the requirements of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI. Additional information regarding Request for Relief No. 93-05 was submitted by letter dated January 20, 1994. The Idaho National Engineering Laboratory (INEL) staff has evaluated the information provided by the licensee in support of these requests for relief in the following section.

2.0 EVALUATION

The information provided by the licensee in support of the requests for relief has been evaluated and is documented below. The Code of record for the Oconee Nuclear Station, Unit 3, second 10-year inservice inspection (ISI) interval is the 1980 Edition through Winter 1980 Addenda of Section XI.

A. Request for Relief No. 93-02, IWA-4400(a), Hydrostatic Testing of Repair Welds in Steam Generator Shell Bottom Drain Lines

Code Requirement: Paragraph IWA-4400(a) requires a system hydrostatic pressure test in accordance with IWA-5000 after repairs made by welding on the pressure-retaining boundary. For the Class 2 components in this

ATTACHMENT

request, a system hydrostatic pressure test in accordance with IWC-5222 is required.

Licensee's Code Relief Request: The licensee has requested permanent relief from the Code-required system hydrostatic pressure test of the welds and Class 2 lines on the steam generator side of Valves 3FDW-141, 3FDW-142, 3FDW-143, 3FDW-144, 3FDW-206, 3FDW-207, 3FDW-208, and 3FDW-209 (four valves per generator).

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

"Due to the inability to isolate any of these welds from the steam generators, performing a hydrostatic pressure test on these 1 1/2" socket welds would require A) that the steam generators, the main steam lines and over 600 feet of feedwater lines must be filled with water and pressurized and B) temporary supports would have to be installed on the main steam piping. Performing the hydrostatic test would result in an excessive burden without a compensating increase in the level of quality and safety. Performing a hydro pressure test on these welds would expose the steam generators to a needless cycle possibly shortening the life of the steam generator.

"Normally, these welds would only receive a visual (no surface nor volumetric examinations). The PT or MT nondestructive examinations performed on both the root and final weld passes assures that there are no significant flaws in the welds. The root and final PT/MT examinations provide (to a degree) a volumetric examination dimension.

"The VT-2 examinations at normal operating pressure will substantiate the ability of the welds to maintain leak tightness for the conditions they were designed for. Additionally, from a statistics bases, Oconee has a greater than 95-95 confidence level for acceptable hydro tests.

"The alternate examinations along with Oconee's excellent welding record will provide an equal, if not greater acceptance level of assurance than from the original requirements without any harmful effects created from cycling the steam generators. Therefore, these alternate tests will provide an acceptable level of assurance for the quality of the welds, and the health and safety of the general public will not be diminished."

Licensee's Proposed Alternative Examination: The subject socket welds received a surface examination of the root pass, a surface examination of the completed weld, and a VT-2 visual examination during pressure testing at normal operating pressure.

Evaluation: The Code requires a system hydrostatic pressure test of the subject repair welds. However, these welds cannot be isolated from the steam generators and performance of the hydrostatic test would require that the steam generators, the main steam lines, and over 600 feet of connecting feedwater piping be filled with water and pressurized. Additionally, temporary supports would have to be installed for the main steam system. This would create a significant burden on the licensee without a compensating increase in quality and safety.

In lieu of the hydrostatic test, the licensee performed a surface examination on the root pass and on the completed weld, and a VT-2 visual examination during pressure testing at normal operating pressure. These examinations would have detected any significant fabrication problems that may have occurred and have provided reasonable assurance of the operational readiness of the system. Therefore, it is recommended that the proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the second 10-year ISI interval. Due to continual changes in Code requirements, permanent relief is not possible and should not be given.

B. Request for Relief No. 93-04, IWA-4400(a), Hydrostatic Testing of Repair Welds for the Decay Heat Removal Header Isolation Valves

Code Requirement: Paragraph IWA-4400(a) requires a system hydrostatic pressure test in accordance with IWA-5000 after repairs made by welding on the pressure-retaining boundary. For the Class 2 components in this request, a system hydrostatic pressure test in accordance with IWC-5222 is required.

Licensee's Code Relief Request: The licensee has requested relief from the Code-required system hydrostatic pressure test, which is required for repair welds and once during the 10-year ISI interval, for the Class 2 welds and piping from Valves 3LP-17 and 3LP-18 downstream to the Reactor Pressure Vessel (RPV).

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

"Due to the inability to isolate valves 3LP-17 and -18 from the reactor vessel, performing a hydrostatic pressure test on the downstream side of these valves would result in reactor vessel overpressurization. Therefore, it is impractical to hydro these welds (for repair or ten year ISI). Check valves downstream of 3LP-17 and -18 would prevent these subject welds from being pressurized from the RCS during mini-hydro (placing the RCS above 2200 psig for a brief period of time during startup as required by Technical Specifications).

"The VT-2 examinations at normal operating pressure will substantiate the ability of the welds to maintain leak tightness for the conditions they were design for. The 100% RT of each weld will ensure that there are not unacceptable defects or inclusions that could weaken the welds. Therefore, these alternate examinations will provide an acceptable level of assurance concerning the quality of the piping sections, and the health and safety of the general public will not be diminished."

Licensee's Proposed Alternative Examination: The subject welds will receive a 100% radiographic (RT) examination and a VT-2 visual examination during pressure testing at normal operating pressure.

Evaluation: The Code requires a system hydrostatic pressure test for the subject repair welds. However, the licensee states that the subject welds cannot be isolated from the RPV and that performance of the hydrostatic test would overpressurize the RPV. In addition, check valves downstream from Valves 3LP-17 and 3LP-18 prevent the repair area from being pressurized from the vessel side of the valves. Therefore, check valve configuration makes the Code-required system hydrostatic pressure test impractical to perform. To perform the required hydrostatic pressure test, portions of the low pressure injection system would have to be redesigned and modified. This would represent a considerable burden on the licensee.

In lieu of the system hydrostatic test, the licensee has proposed to perform a 100% RT volumetric examination and a VT-2 visual examination during pressure testing at normal operating pressure. These examinations should ensure the structural integrity of the repair welds and provide reasonable assurance of the operational readiness of the subject portions

of the Low Pressure Injection (LPI) discharge system. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

C. Request for Relief No. 93-05, IWD-5223, System Hydrostatic Pressure Testing of Class 3 Feedwater Piping

Code Requirement: Table IWD-2500-1 requires a system hydrostatic pressure test of Class 3 pressure-retaining components once each 10-year inspection interval in accordance with IWD-5223.

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required system hydrostatic pressure test of portions of the Class 3 feedwater piping between Valves 3FDW-32, 3FDW-36, 3FDW-37, 3FDW-127, and 3FDW-245, and between Valves 3FDW-41, 3FDW-45, 3FDW-46, 3FDW-216, and 3FDW-251.

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

"Consistent with the philosophy of ASME Code Case N-498, this request is premised upon performing a VT-2 examination at normal operating pressure in lieu of the ten year ISI hydrostatic test. The portion of the system addressed by this relief is Class 3 and cannot be isolated from the Class 2 portion to be hydrostatically tested. Code Case N-498 currently does not cover Class 3 systems. To perform the required hydrostatic test of the Class 3 portion will require the Class 2 portion to be hydro tested. The hydrostatic testing of the Class 2 portion, in lieu of pressure testing at operating conditions as allowed by Code Case N-498, will result in undue burden without a compensating increase in the level of quality or safety.

"Due to the inability to isolate any of these welds from the steam generators, performing a hydrostatic pressure test on any of these sections of piping would require A) that the steam generator, the main steam lines, and over 600 feet of feedwater lines (excluding the subject Class 3 piping) must be filled with water and pressurized and B) temporary supports would have to be installed on the main steam piping. Performing a hydro pressure test on these welds would expose the steam generators to a needless cycle possibly shortening the life of the steam generators.

"The VT-2 examinations at normal operating pressure will substantiate the ability of the welds to maintain leak tightness for the conditions they

were designed for. Additionally, from a statistics bases, Oconee has greater than a 95-95 confidence level the welds would not fail a hydro test.

"This alternate examination along with Oconee's excellent welding provides an acceptable level of assurance concerning the quality of the piping section, and the health and safety of the general public will not be diminished."

Licensee's Proposed Alternative Examination: The subject Class 3 piping will receive a VT-2 visual examination during pressure testing at normal operating pressure. In addition, by letter dated January 20, 1994, the licensee committed to perform volumetric examinations on 10 of the welds in the subject system. The licensee stated that this examination and sampling is equivalent to that of Class 2 piping welds.

Evaluation: The Code requires a system hydrostatic pressure test for Class 3 pressure-retaining components once each inspection interval. Alternatives to this requirement were not considered in Code Case N-498, *Alternative Rules for 10-Year Hydrostatic Pressure Testing for Class 1 and 2 Systems, Section XI, Division 1*, because Class 1 and 2 systems receive surface and/or volumetric examinations whereas Class 3 systems do not.

The licensee states that the subject portions of Class 3 feedwater piping cannot be isolated from connecting Class 2 piping and that performance of the Class 3 hydrostatic pressure test will require simultaneous testing of the Class 2 portions. Because these portions cannot be isolated from the steam generators, performing the hydrostatic test would require that the steam generators, the main steam lines, and over 600 feet of connecting feedwater lines would have to be filled with water and pressurized. This would also require the installation of temporary supports for the main steam system. Imposition of this requirement on the licensee would create a considerable burden without a compensating increase in quality and safety.

In lieu of the system hydrostatic test, the licensee has proposed to perform a volumetric examination of 10 welds in the subject Class 3 system, in addition to a VT-2 visual examination during pressure testing at normal operating pressure. This alternative is comparable to the examinations being performed for Class 2 systems, and should therefore provide reasonable assurance of operational readiness of the subject Class 3 portions of the feedwater system.

Considering the burden on the licensee if the Code requirements were imposed, it is recommended that the licensee's proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

D. Request for Relief No. 93-06, IWC-5210(a)(2), Hydrostatic Testing of Repaired or Replaced Components

Code Requirement: IWC-5210(a)(2) states that a system hydrostatic pressure test per IWA-5211(d) shall be performed for repaired and replaced components, or portions of systems that have been altered.

Licensee's Code Relief Request: The licensee has requested relief from performing the Code-required system hydrostatic pressure test of Class 2, 2 inch socket welds on the Core Flood Tank (CFT) side of CFT drain line block Valves 3CF-20 and 3CF-22.

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

"During implementation of a modification, valves 3CF-20 and 3CF-22 were replaced during [the] Refueling Outage ending September 1992. To be in compliance with ASME Code requirements, Oconee has used ASME Code Case N-416 for justification of not performing this hydro at that time. This request is premised on performing a hydro (ten year ISI or repair/replacement) just to examine these two 2" socket welds would result in an excessive burden almost to the point of impractical without a compensating increase in the level of quality and safety.

"Although the valve line-up for performing a hydro pressure test would not violate Low Temperature Over Pressurization (LTOP) requirements, LTOP would be challenged. The window of opportunity to perform this test is

limited to an extremely small window due to the restrictions of operability, LTOP, personal safety, and [the] production of the borated water for the test medium.

"A hydro would dictate the generation of an additional 6,000 gallons of borated water to be added to the 16,600 gallons presently in the CFTs. During the time of the test, most of the borated water would have been depleted form [from] the bleed tanks for defueling or refueling levels. Therefore the majority of the 6,000 gallons would have to be produced form [from] the Boric Acid Mixing Tank (about 500 gallons). It takes about one day to produce the 500 gallon batch of borated water and approximately 10 to 12 days to produce the 6,000 needed gallons. This would extend the RFO several days. After the test, Oconee would have to process this 6,000 gallons of borated liquid waste. The boron would have to be extracted and processed for burial and the water processed to acceptable radiation levels for release.

"Oconee would also have to run a temporary line from the basement to the penetration room to supply the hydro pump. This would probably contaminate the hydro pump.

"Normally, these welds would only receive a visual (no surface nor volumetric examinations). The PT nondestructive examinations assure that there were no significant flaws in the welds.

"The VT-2 examinations at normal operating pressure substantiated the ability of the welds to maintain leak tightness for the conditions they were designed for. Additionally, from a statistics bases, Oconee has greater that a 95-95 confidence level the welds would not fail a hydro test.

"The alternate examinations, the constant monitoring and daily pressure checks performed on the CFTs (equivalent to a drop pressure test) and Oconee's excellent welding record provides an equal if not greater acceptance level of assurance than from the original ASME requirements without generating unnecessary waste. Therefore, an acceptable level of assurance for the quality of the welds has been provided, and the health and safety of the general public has not been diminished."

Licensee's Proposed Alternative Examination: The subject 2-inch socket welds received a surface examination and a VT-2 visual examination during pressure testing at normal operating pressure. In addition, CFT pressure is checked twice daily per Technical Specifications (the pressure is required to be 600 psig ± 25), is under constant surveillance by operators in the control room, and is monitored by audio and visual alarms.

Evaluation: The Code requires a system hydrostatic test for Class 2 components that are repaired or replaced. As stated by the licensee, performance of the hydrostatic test will require the generation of an additional 6,000 gallons of borated water to pressurize the core flood tanks and test the subject welds. This additional borated water would then have to be processed as waste. Imposition of the Code requirement would cause a considerable burden without a compensating increase in safety.

In lieu of the required hydrostatic test, the licensee performed a surface examination of the subject welds along with a VT-2 visual examination during pressure testing at operating pressure. In addition, portions of the CFT drain lines are pressurized to 600 psig during operation and are monitored regularly. Any leakage in these lines that does occur would be detected by the resulting pressure drop. Therefore, it is concluded that this alternative will provide reasonable assurance of the operational readiness of the CFT drain lines.

Based on the burden that would result if the Code requirements were imposed, and on the examinations that are being performed in lieu of the Code requirements, it is recommended that the licensee's proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

3.0 CONCLUSION

The INEL staff has reviewed the licensee's submittal and concludes that, pursuant to 10 CFR 50.55a(g)(6)(i), the requirements of the Code are impractical and relief should be granted for Request for Relief No. 93-04.

For Requests for Relief Nos. 93-02, 93-05, and 93-06, it was determined that the Code requirements would cause a burden on the licensee without a compensating increase in quality and safety. Therefore, it is recommended that the licensee's proposed alternatives be authorized pursuant to 10 CFR 50.55a(a)(3)(ii).