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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE INSERVICE INSPECTION PROGRAM RELIEF REQUESTS

TEXAS UTILITIES ELECTRIC COMPANY

COMANCHE PEAK STEAM ELECTRIC STATION, UNIT 1

DOCKET NO. 50-445

1.0 INTRODUCTION

The technical specifications for the Comanche Peak Steam Electric Station, Unit 1 state that the inservice inspection and testing 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 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) of Title 10 of the Code of Federal Regulations 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 ten-year interval 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 twelve 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 Comanche Peak Steam Electric Station first 10-year Inservice Inspection (ISI) Interval is the 1986 Edition, of ASME Section XI. 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. By letter dated September 23, 1993, TU Electric submitted requests for relief Nos. A-1 and A-2, respectively, regarding corrective measures for leaking bolted connections, and VT-2 visual examination of bolted connections in borated insulated systems.

2.0 EVALUATION

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 alternative examinations contained in requests for relief Nos. A-1 and A-2. The staff adopts the contractor's conclusions and recommendations presented in the attached Technical Evaluation Summary with the following additional information for relief A-1. The 1990 Addenda to the Code has not yet been adopted, however, the portion of the Addenda that is applicable to relief A-1 has been reviewed and determined to provide an acceptable level of quality and safety.

3.0 CONCLUSION

The staff has determined that the proposed alternatives provide an acceptable level of quality and safety and therefore, authorizes their use pursuant to 10 CFR 50.55a(a)(3)(i). The licensee's proposed alternatives are authorized as follows:

(1) The alternative contained in Relief Request A-1 is authorized as proposed.

(2) The alternative contained in Relief Request A-2 is authorized as proposed with the condition that during the system leakage test a minimum hold time of 4 hours occurs prior to the VT-2 examination.

Attachment:
Technical Evaluation Summary

Principal Contributor: T. McLellan, NRR/EMCB

Date: July 26, 1994

ATTACHMENT

TECHNICAL EVALUATION SUMMARY
OF THE FIRST 10-YEAR INTERVAL INSERVICE INSPECTION
ADDITIONAL REQUESTS FOR RELIEF
FOR
TEXAS UTILITIES ELECTRIC COMPANY
COMANCHE PEAK STEAM ELECTRIC STATION, UNIT 1
DOCKET NUMBER: 50-445

1.0 INTRODUCTION

The licensee, Texas Utilities Electric Company, submitted additional requests for relief from American Society of Mechanical Engineers, Boiler and Pressure Vessel Code (ASME), Section XI requirements by letter dated September 23, 1993. The applicable Code for the first 10-year inservice inspection interval, which commenced on August 13, 1990, is the 1986 Edition of ASME Section XI. The Idaho National Engineering Laboratory (INEL) staff, has evaluated the subject requests for relief in the following sections.

2.0 EVALUATION

The information provided by the licensee in support of the alternatives to the Code requirements has been evaluated and the bases for authorizing the alternatives are documented below.

A. Request for Relief A-1, Subparagraph IWA-5250(a)(2), Corrective Measures for Leaking Bolted Connections

Code Requirement: Subparagraph IWA-5250(a)(2) requires that the source of leakages detected during a system pressure test be located and evaluated for corrective measures. If leakage occurs at a bolted connection, the bolting shall be removed, visually examined (VT-3) for corrosion, and evaluated in accordance with IWA-3100.

Licensee Code Relief Request: The licensee requested relief from removal of all bolting for VT-3 examination for corrosion when leakage occurs at a bolted connection.

Licensee's Basis for Requesting Relief: The licensee stated:

"The time and radiation exposure associated with removal of all bolting at a connection is not warranted to determine the condition of the bolted connection. Removal of 1 bolt at the position closest to the leakage source will reveal sufficient evidence to indicate the overall condition of the bolted connection.

Leakage does not typically occur in a uniform pattern around a bolted connection, but rather in a localized area along the perimeter. The bolt closest to the leakage source will be most susceptible to damage."

Licensee's Proposed Examination: The licensee proposed to use Subparagraph IWA-5250(a)(2) of the 1990 Addenda in lieu of this same paragraph from the 1986 Edition. The 1990 Addenda allows for removal and examination of the bolt closest to the leakage source. Examination of the remaining bolting is contingent upon the condition of the examined bolt.

Evaluation: The 1986 Edition requires that all bolting be removed and VT-3 examined at leaking bolted connections. The licensee requested the use of subparagraph IWA-5250(a)(2) of the 1990 Addenda. The 1990 Addenda allows for removal and examination of the bolt closest to the leakage source. If that bolt shows evidence of degradation, all remaining bolting in the connection must be removed, VT-3 examined, and evaluated. This approach for the determination of degradation of bolting is included in later Editions and Addenda to the Code and provides an acceptable level of quality and safety for bolted connections. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the licensee's proposed alternative examination should be authorized as requested.

B. Request for Relief A-2, Subparagraph IWA-5242(a), VT-2 Visual Examination of Bolted Connections in Borated, Insulated Systems

Code Requirement: Subparagraph IWA-5242(a) requires that insulation be removed from pressure-retaining bolted connections for visual examination (VT-2) on systems that are borated to control reactivity.

Licensee Code Relief Request: The licensee has requested relief from the removal of insulation at bolted connections of borated systems as required by the Code to perform a VT-2 examination during the system leakage test.

Licensee's Basis for Requesting Relief: The licensee stated:

"System leakage tests are conducted when the Class 1 pressure boundary is raised to nominal operating pressure and temperature as part of normal startup following a refueling outage. Removal and reinstallation of insulation under nominal operating temperature creates a hardship due to the extreme heat. Cooling down to a temperature of 200°F, as allowed by IWA-5245 would unduly extend the outage duration due to heatup/cooldown rates, as well as introduce additional thermal cycles. Additionally, radiation levels are typically higher during startup than during shutdown.

Significant leakage from insulated bolted connections will be apparent at exposed insulation joints and surfaces and would be detected during a VT-2 examination of these insulation joints and surfaces.

Programs which were developed in response to Generic Letter 88-05 are currently in place to address the potential for corrosion of carbon steel portions of the reactor coolant pressure boundary when exposed to concentrated boric acid. Examinations conducted in accordance with ASME Section XI, designed to detect boric acid corrosion of the primary system serve to enhance these programs but are not required to ensure effective programs."

Licensee's Proposed Examination: The licensee has proposed that, in lieu of removing/reinstalling insulation at bolted connections during the inservice leak test performed at plant startup, the insulation be removed from bolted connections during each refueling outage and the bolted connection examined for evidence of leakage by VT-3 certified personnel. During the inservice leak test, the exposed insulation surfaces and joints at bolted connections shall be VT-2 examined to ensure that no significant leakage exists.

Evaluation: In accordance with IWA-5242(a), insulation shall be removed from pressure-retaining bolted connections of borated systems when performing VT-2 visual examinations.

The licensee performs the system leakage tests when the Class 1 systems are raised to nominal operating pressure and temperature as part of normal startup following a refueling outage. The removal and reinstallation of insulation at nominal operating temperature, i.e., under extreme heat conditions, would be required to satisfy the requirements of the Code. Cooling down to a temperature of 200°F, as allowed by IWA-5245, would subject the systems to additional thermal cycles. The licensee states that any significant leakage from insulated bolted connections will be apparent at exposed insulation joints and surfaces and will be detected during a VT-2 examination of these joints.

Leakage of borated water leaves a crystalline residue. The licensee's proposed alternative examination (to remove insulation at bolted connections for VT-3 examination during each refueling outage) will detect any service-related leakage. The Code-required VT-2 examination of the bolted connections during the system leakage test in conjunction with plant start-up will detect any leakage that may be occurring, provided that there is a minimum hold time of 4 hours at nominal operating pressure prior to the VT-2 examination. The Code recognizes that to optimize the detection of leakage of insulated systems during a system leakage test, a minimum hold time of 4 hours at nominal operating pressure must occur prior to the VT-2 examination. Four hours will provide sufficient time for any leakage at the bolted connection to migrate through the insulation. The licensee's proposed alternative should be considered acceptable, provided that the VT-2 examination occurs after a minimum hold time of 4 hours at nominal operating pressure.

It is concluded that the licensee's proposed alternative provides an acceptable level of quality and safety for bolted connections. Service-related leakage will be detected during the refueling outages by direct visual examination. Leakage occurring during the system leak test should be evident provided a minimum hold time of 4 hours is observed prior to the VT-2 examination. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the licensee's proposed alternative examination should be authorized with the above condition.

3.0 CONCLUSION

We have reviewed the licensee's submittal and have concluded that the proposed alternatives provide an acceptable level of quality and safety and therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the licensee's proposed alternatives should be authorized as follows: the alternative contained in Relief Request A-1 should be authorized as proposed. However, the alternative contained in Relief Request A-2, should be authorized as proposed with the condition that during the system leakage test a minimum hold time of 4 hours occur prior to the VT-2 examination.