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**Technical Evaluation Report on the First
10-year Interval Inservice Inspection
Program Plan: Texas Utilities Electric
Company, Comanche Peak Steam
Electric Station, Unit 2,
Docket Number 50-446**

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ATTACHMENT

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Docket Number 50-446**

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ABSTRACT

This report presents the results of the evaluation of the *Comanche Peak Steam Electric Station, Unit 2, First 10-Year Interval Inservice Inspection Program Plan*, Revision 0, submitted October 6, 1993, and Interim Change Requests dated May 31, 1994, and December 21, 1994, including the requests for relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI requirements that the licensee has determined to be impractical. The *Comanche Peak Steam Electric Station, Unit 2, First 10-Year Interval Inservice Inspection Program Plan*, Revision 0, is evaluated in Section 2 of this report. The Inservice Inspection (ISI) Program Plan is evaluated for (a) compliance with the appropriate edition/addenda of Section XI, (b) acceptability of the examination sample, (c) correctness of the application of system or component examination exclusion criteria, and (d) compliance with ISI-related commitments identified during previous Nuclear Regulatory Commission reviews. The requests for relief are evaluated in Section 3 of this report.

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SUMMARY

The licensee, Texas Utilities Electric Company, has prepared the *Comanche Peak Steam Electric Station, Unit 2, First 10-Year Interval Inservice Inspection Program Plan*, Revision 0, to meet the requirements of the 1986 Edition of the American Society of Mechanical Engineers (ASME) Code, Section XI. The first 10-year interval began August 3, 1993.

The information in the *Comanche Peak Steam Electric Station, Unit 2, First 10-Year Interval Inservice Inspection Program Plan*, Revision 0, submitted October 6, 1993, was reviewed. Included in the review were the requests for relief from the ASME Code Section XI requirements that the licensee has determined to be impractical. As a result of this review, a request for additional information (RAI) was prepared describing the information and/or clarification required from the licensee in order to complete the review. The licensee provided the requested information in the submittal dated January 17, 1995.

Based on the review of the *Comanche Peak Steam Electric Station, Unit 2, First 10-Year Interval Inservice Inspection Program Plan*, Revision 0, the licensee's responses to the Nuclear Regulatory Commission's RAI, and the recommendations for granting relief from the ISI examinations that cannot be performed to the extent required by Section XI of the ASME Code, no deviations from regulatory requirements or commitments were identified in the *Comanche Peak Steam Electric Station, Unit 2, First 10-Year Interval Inservice Inspection Program Plan*, Revision 0.

CONTENTS

ABSTRACT	ii
SUMMARY	iii
1. INTRODUCTION	1
2. EVALUATION OF INSERVICE INSPECTION PROGRAM PLAN	4
2.1 Documents Evaluated	4
2.2 Compliance with Code Requirements	4
2.2.1 Compliance with Applicable Code Editions	4
2.2.2 Acceptability of the Examination Sample	4
2.2.3 Exemption Criteria	5
2.2.4 Augmented Examination Commitments	5
2.3 Conclusion	6
3. EVALUATION OF RELIEF REQUESTS	7
3.1 Class 1 Components (No relief requests)	
3.2 Class 2 Components (No relief requests)	
3.3 Class 3 Components (No relief requests)	
3.4 Pressure Tests (No relief requests)	
3.5 General	7
3.5.1 Ultrasonic Examination Techniques (No relief requests)	
3.5.2 Exempted Components (No relief requests)	
3.5.3 Other	7
3.5.3.1 Request for Relief A-1, IWA-5250(a)(2), Corrective Measures for Leakage at Bolted Connections	7
3.5.3.2 Request for Relief A-2, Revision 1, IWA-5242(a), Visual Examination of Insulated Components In Borated Systems	9
4. CONCLUSION	12
5. REFERENCES	13

TECHNICAL EVALUATION REPORT ON THE
FIRST 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN
TEXAS UTILITIES ELECTRIC COMPANY
COMANCHE PEAK STEAM ELECTRIC STATION, UNIT 2
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1. INTRODUCTION

Throughout the service life of a water-cooled nuclear power facility, 10 CFR 50.55a(g)(4) (Reference 1) requires that components (including supports) that are classified as American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Class 1, Class 2, and Class 3 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*, (Reference 2) to the extent practical within the limitations of design, geometry, and materials of construction of the components. This section of the regulations also requires that inservice examinations of components and system pressure tests conducted during the initial 120-month inspection interval comply with the requirements in the latest edition and addenda of the Code incorporated by reference in 10 CFR 50.55a(b) on the date 12 months prior to the start of the 120-month inspection interval, subject to the limitations and modifications listed therein. The components (including supports) may meet requirements set forth in subsequent editions and addenda of this Code that are incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein and subject to Nuclear Regulatory Commission (NRC) approval. The licensee, Texas Utilities Electric Company (TU Electric), has prepared the *Comanche Peak Steam Electric Station, Unit 2, First 10-Year Interval Inservice Inspection Program Plan*, Revision 0 (Reference 3), to meet the requirements of the 1986 Edition of the ASME Code, Section XI. The first 10-year interval began August 3, 1993.

As required by 10 CFR 50.55a(g)(5), if the licensee determines that certain Code examination requirements are impractical and requests relief from them, the licensee shall submit information and justification to the NRC to support that determination.

Pursuant to 10 CFR 50.55a(g)(6), the NRC will evaluate the licensee's determination that Code requirements are impractical to implement. The NRC 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 on the facility.

Alternatively, pursuant to 10 CFR 50.55a(a)(3), the NRC will evaluate the licensee's determination that either (i) the proposed alternatives provide an acceptable level of quality and safety, or (ii) Code compliance would result in hardship or unusual difficulty without a compensating increase in safety. Proposed alternatives may be used when authorized by the NRC.

The information in the *Comanche Peak Steam Electric Station, Unit 2, First 10-Year Interval Inservice Inspection Program Plan*, Revision 0, submitted October 6, 1993, was reviewed. The review of the ISI Program Plan was performed using the Standard Review Plans of NUREG-0800 (Reference 5), Section 5.2.4, "Reactor Coolant Boundary Inservice Inspections and Testing," and Section 6.6, "Inservice Inspection of Class 2 and 3 Components."

On May 31, 1994, and December 21, 1994, TU Electric submitted requests for relief from the ASME Code Section XI requirements that the licensee has determined to be impractical (References 4 and 8).

In a letter dated November 9, 1994 (Reference 6), the NRC requested additional information that was required to complete the review of the ISI Program Plan and relief requests. The requested information was provided by the licensee in the "Response to Request for Information on the CPSES Unit 2, First Ten-Year Inservice Inspection Program Plan" dated January 17, 1995 (Reference 7). In this response the licensee addressed the staff questions and submitted isometric drawings and tables to support the evaluation.

The *Comanche Peak Steam Electric Station, Unit 2, First 10-Year Interval Inservice Inspection Program Plan*, Revision 0, is evaluated in Section 2 of this report. The ISI Program Plan is evaluated for (a) compliance with the appropriate edition/addenda of Section XI, (b) acceptability of examination

sample, (c) correctness of the application of system or component examination exclusion criteria, and (d) compliance with ISI-related commitments identified during the NRC's previous reviews.

The requests for relief are evaluated in Section 3 of this report. Unless otherwise stated, references to the Code refer to the ASME Code, Section XI, 1986 Edition. Specific inservice test (IST) programs for pumps and valves are being evaluated in other reports.

2. EVALUATION OF INSERVICE INSPECTION PROGRAM PLAN

This evaluation consists of a review of the applicable program documents to determine whether or not they are in compliance with the Code requirements and any previous license conditions pertinent to ISI activities. This section describes the submittals reviewed and the results of the review.

2.1 Documents Evaluated

Review has been completed on the following information from the licensee:

- (a) *Comanche Peak Steam Electric Station, Unit 2, First 10-Year Interval Inservice Inspection Program Plan*, Revision 0, submitted October 6, 1993 (Reference 3).
- (b) Letter, dated May 31, 1994, containing Interim Change Request No. ISI-2R0-001 (Reference 8).
- (c) Letter, dated December 21, 1994, containing Interim Change Request Nos. ISI-2R0-002, -003, -004, and -005 (Reference 4).
- (d) Letter, dated January 17, 1995, containing the response to the NRC's Request for Additional Information (Reference 7).

2.2 Compliance with Code Requirements

2.2.1 Compliance with Applicable Code Editions

The ISI Program shall be based on the Code editions defined in 10 CFR 50.55a(g)(4) and 10 CFR 50.55a(b). Based on the starting date of August 3, 1993, the Code applicable to the first interval ISI program is the 1986 Edition. As stated in Section 1 of this report, the licensee has prepared the *Comanche Peak Steam Electric Station, Unit 2, First 10-Year Interval Inservice Inspection Program Plan*, Revision 0, to meet the requirements of the 1986 Edition.

2.2.2 Acceptability of the Examination Sample

Inservice volumetric, surface, and visual examinations shall be performed on ASME Code Class 1, 2, and 3 components and their supports using sampling schedules described in Section XI of the ASME Code and

10 CFR 50.55a(b). The sample size and weld selection have been implemented in accordance with the Code and 10 CFR 50.55a(b) and appear to be correct. It should be noted that the licensee has augmented the ISI program by the selection of a sample of Class 2 pipe welds that are otherwise excluded from examination because of wall thickness.

2.2.3 Exemption Criteria

The criteria used to exempt components from examination shall be consistent with Paragraphs IWB-1220, IWC-1220, IWC-1230, IWD-1220, and 10 CFR 50.55a(b). The exemption criteria have been applied by the licensee in accordance with the Code, as discussed in the ISI Program Plan, and appear to be correct.

2.2.4 Augmented Examination Commitments

In addition to the requirements specified in Section XI of the ASME Code, the licensee has committed to perform the following augmented examinations:

- (a) Volumetric and surface examination of the Reactor Coolant Pump Flywheels will be performed in accordance with Regulatory Guide 1.14, Revision 1 (Reference 9);
- (b) Surface and visual examination of safety injection pump shrouds will be performed in accordance with NUREG-0797, Supplement 12, at 10-year intervals;
- (c) Eddy current testing of flux thimble tubes will be performed in response to NRC Information Notice 87-44 (9/87) with supplement (3/88), and NRC Bulletin 88-09 (7/88);
- (d) Volumetric examination will be performed on main steam and feedwater piping designated as "break exclusion piping";

- (e) Liquid penetrant and magnetic particle examinations of reactor vessel head and internal lifting devices will be performed once each 10-years;
- (f) Reactor pressure vessel examinations, including the closure head, will be performed in accordance with Regulatory Guide 1.150, Rev. 1 (Reference 10); and
- (g) Volumetric examination of a sample of containment spray and residual heat removal thin-wall pipe welds otherwise excluded from examination because of wall thickness will be performed.

2.3 Conclusion

Based on the review of the documents listed above, no deviations from regulatory requirements or commitments were identified in the *Comanche Peak Steam Electric Station, Unit 2, First 10-Year Interval Inservice Inspection Program Plan*, Revision 0.

3. EVALUATION OF RELIEF REQUESTS

The requests for relief from the ASME Code requirements that the licensee has determined to be impractical for the first 10-year inspection interval are evaluated in the following sections.

3.1 Class 1 Components (No relief requests)

3.2 Class 2 Components (No relief requests)

3.3 Class 3 Components (No relief requests)

3.4 Pressure Tests (No relief requests)

3.5 General

3.5.1 Ultrasonic Examination Techniques (No relief requests)

3.5.2 Exempted Components (No relief requests)

3.5.3 Other

3.5.3.1 Request for Relief A-1, IWA-5250(a)(2), Corrective Measures for Leakage at Bolted Connections

Code Requirement: Paragraph IWA-5250(a)(2) states that the source(s) of leakage detected during the conduct of a system pressure test shall be located and evaluated by the Owner for corrective action. For leakage occurring at a bolted connection, the bolting shall be removed, VT-3 visually examined for corrosion, and evaluated in accordance with IWA-3100.

Licensee's Code Relief Request: The licensee requested relief from the removal and VT-3 visual examination of bolting on bolted connections when leakage is observed during a system pressure test.

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

"It is proposed that subparagraph IWA-5250(a)(2) of the 1990 Addenda be utilized 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 Code requires that if leakage occurs at a bolted connection, all bolting shall be removed, VT-3 visually examined for corrosion, and evaluated in accordance with IWA-3100. As an alternative, the licensee proposes to remove and examine one bolt, closest to the area of leakage. If degradation is noted on that bolt, the remainder of the bolting will be removed, VT-3 visually examined, and evaluated in accordance with IWA-3100.

Later Editions of Section XI require the removal of only one bolt, closest to the source of leakage, for evaluation. This is based on the belief that the bolt closest to the source of leakage should be representative of the state of the bolts in the bolted connection. The INEL staff believes that the licensee's alternative, namely, the removal of one bolt to determine the state of the bolts, provides an acceptable level of quality and safety.

Conclusion: The licensee's proposal to remove and examine the bolt nearest the source of leakage, instead of all the bolts, as part of the evaluation of leakage at a bolted connection should provide an acceptable level of quality and safety. Therefore, it,

is recommended that, the licensee's proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

3.5.3.2 Request for Relief A-2, Revision 1, IWA-5242(a), Visual Examination of Insulated Components In Borated Systems

Code Requirement: Paragraph IWA-5242(a) requires that insulation be removed from pressure-retaining bolted connections for VT-2 visual examination of systems borated for the purpose of controlling reactivity.

Licensee's Code Relief Request: The licensee requested relief from the requirement to remove insulation from pressure-retaining bolted connections in systems borated for the purpose of controlling reactivity when performing VT-2 visual examinations in conjunction with leak tests.

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

"It is proposed that rather than removing/installing insulation at bolted connections during the inservice leak test performed at plant startup, the insulation shall be removed and the connection examined during each refueling outage by VT-3 certified personnel. Any evidence of leakage will be evaluated in accordance with IWA-5250(a)(2). During the inservice leak test, the exposed insulation surfaces and joints at bolted connections shall be examined via a VT-2 examination to ensure that no significant leakage exists. To assure that adequate time has elapsed to allow leakage from the subject bolted connections to migrate through the insulation, the inservice leak test hold time at nominal operating pressure shall be extended to 4 hours."

Evaluation: The Code requires that insulation be removed from bolted connections in systems bolated for the purpose of controlling reactivity as a prerequisite to performing a VT-2 visual examination.

The licensee has stated that the requirement to remove insulation from bolted connections in such systems to perform a VT-2 visual examination under high temperature conditions results in an unusual hardship. Using the provision of IWA-5245 that allows cooldown of the systems to a temperature corresponding to 200°F prior to visual examination subjects the systems to unnecessary cycles and extended outages.

Based on review of the Code requirements and the licensee's proposed alternative, the INEL staff has determined that imposing the Code requirement to remove insulation from bolted connections in systems bolated for the purpose of controlling reactivity to perform a VT-2 visual examination is a hardship for Comanche Peak Steam Electric Plant that does not provide a compensating increase in the level of quality and safety. The licensee's proposed alternative, as stated below, should provide reasonable assurance of continued structural integrity.

- 1) The insulation shall be removed and the connection examined during each refueling outage by VT-3 visual certified personnel.

- 2) Any evidence of leakage will be evaluated in accordance with IWA-5250(a)(2).
- 3) During the inservice leak test, the exposed insulation surfaces and joints at bolted connections shall be VT-2 visually examined.
- 4) A 4-hour hold time will be established prior to the VT-2 visual examination to allow leakage from the subject bolted connections to migrate through the insulation..

Conclusion: Imposing the Code requirement to remove insulation from bolted connections in systems borated for the purpose of controlling reactivity to perform a VT-2 visual examination results in a hardship without a compensating increase in the level of quality and safety. The licensee's proposed alternative, as stated above, should provide reasonable assurance of operational readiness. Therefore, it is recommended that, the licensee's proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

4. CONCLUSION

Pursuant to 10 CFR 50.55a(a)(3), it is concluded that for Requests for Relief A-1 and A-2, Revision 1, the licensee's proposed alternatives will (i) provide an acceptable level of quality and safety, or (ii) Code compliance will result in hardship or unusual difficulty without a compensating increase in safety. In these cases, it is recommended that the licensee's proposed alternatives be authorized.

Based on the review of the *Comanche Peak Steam Electric Station, Unit 2, 10-Year Interval Inservice Inspection Program Plan*, Revision 0, the licensee's response to the NRC's request for additional information, and the recommendations for authorizing relief from the ISI examination requirements of Section XI of the ASME Code, no deviations from regulatory requirements or commitments were identified.

5. REFERENCES

1. Code of Federal Regulations, Title 10, Part 50.
2. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Division 1:
1986 Edition
3. *Comanche Peak Steam Electric Station, Unit 2, First 10-Year Interval Inservice Inspection Program Plan*, Revision 0, submitted October 6, 1993.
4. Letter, dated December 21, 1994, C. L. Terry (TU Electric) to Document Control Desk, with Interim Change Request Nos. ISI-2R0-002, -003, -004, and -005.
5. NUREG-0800, *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants*, Section 5.2.4, "Reactor Coolant Boundary Inservice Inspection and Testing," and Section 6.6, "Inservice Inspection of Class 2 and 3 Components," July 1981.
6. Letter, dated November 9, 1994, T. J. Polich (NRC) to C. L. Terry (TU Electric) containing Request for Additional Information (RAI).
7. Letter, dated January 17, 1995, C. L. Terry (TU Electric) to Document Control Desk, containing the response to the NRC's Request for Additional Information.
8. Letter, dated May 31, 1994, W. J. Cahill, Jr. (TU Electric) to Document Control Desk, with Interim Change Request No. ISI-2R0-001.
9. Regulatory Guide 1.14, *Reactor Coolant Pump Flywheel Integrity*, Revision 1, dated August 1975.
10. NRC Regulatory Guide 1.150, *Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations*, Revision 1, February 1983.

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10. SUPPLEMENTARY NOTES

11. ABSTRACT (200 words or less)

This report documents the results of the evaluation of the *Comanche Peak Steam Electric Station, Unit 2, First 10-Year Interval Inservice Inspection Program Plan*, Revision 0, submitted October 6, 1993, including the request for relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI requirements that the licensee has determined to be impractical. The *Comanche Peak Steam Electric Station, Unit 2, First 10-Year Interval Inservice Inspection Program Plan*, Revision 0, is evaluated in Section 2 of this report. The ISI Program Plan is evaluated for (a) compliance with the appropriate edition/addenda of Section XI, (b) acceptability of examination sample, (c) correctness of the application of system or component examination exclusion criteria, and (d) compliance with ISI-related commitments identified during previous Nuclear Regulatory Commission (NRC) reviews. The request for relief is evaluated in Section 3 of this report.

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