September 27, 2006

Mr. M. R. Blevins
Senior Vice President &
Chief Nuclear Officer
TXU Power
Attn: Regulatory Affairs Department
P.O. Box 1002
Glen Rose, TX 76043

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION, UNITS 1 AND 2 - RELIEF REQUEST FOR 10-YEAR PUMP AND VALVE INSERVICE TESTING PROGRAM (TAC NOS. MC5385 AND MC5386)

Dear Mr. Blevins:

By letter dated November 30, 2004, TXU Generation Company LP, the licensee for Comanche Peak Steam Electric Station (CPSES), Units 1 and 2, submitted Relief Request P-1 for Safeguards Building Sump Pumps (SBSPs) from certain inservice testing requirements of American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants*. By letters dated November 15, 2005, and June 29, 2006, the licensee provided additional information related to the Relief Request P-1.

The SBSPs are installed to detect and mitigate passive failures in the emergency core cooling system and containment spray system after a loss-of-coolant accident and to prevent flooding of the safety-related systems. Currently, CPSES is testing these pumps in a dead-head condition. Testing the pumps in a dead-head condition is not an acceptable test method. It provides little or no useful information for assessing the conditions and operability of the pump, and may even cause pump degradation. Operating experience and equipment history show that testing the pumps in a dead-head condition can cause equipment reliability concerns. Consequently, CPSES proposes an alternative test by filling up the sump to the same approximate level and pumping into the same destination each time the test is performed.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the licensee's request. Based on that review, the NRC staff concludes that the Code-required test is impractical to perform without significant plant modifications, that the proposed alternative test would provide reasonable assurance of pump operability without major degradation, and that providing interim relief will allow time for the licensee to explore other alternatives, make necessary plant modifications for performing the required test, or submit a revised relief request.

Accordingly, pursuant to paragraph 50.55a(f)(6)(i) of Title 10 of the *Code of Federal Regulations*, Relief Request P-1 is partially granted for an interim period of up to two refueling cycles but not to exceed 4 years. Granting the relief pursuant to 10 CFR 50.55a(f)(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. All other ASME Code

requirements for which relief has not been specifically requested and authorized herein by the NRC staff remain applicable. The NRC staff's safety evaluation is enclosed.

Sincerely,

/RA/

David Terao, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-445 and 50-446

Enclosure: Safety Evaluation

cc: See next page

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David Terao, Chief
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Docket Nos. 50-445 and 50-446

Enclosure: Safety Evaluation

cc: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SECOND 10-YEAR INTERVAL INSERVICE TESTING

REQUEST FOR RELIEF NO. P-1

COMANCHE PEAK STEAM ELECTRIC STATION, UNITS 1 AND 2

TXU GENERATION COMPANY, LLC

DOCKET NOS. 50-445 AND 50-446

1.0 INTRODUCTION

By letter dated November 30, 2004, TXU Generation Company LP (TXU), the licensee, for Comanche Peak Steam Electric Station (CPSES), Units 1 and 2, submitted Relief Request P-1 for Safeguards Building Sump Pumps (SBSPs) from certain inservice testing (IST) requirements of American Society of Mechanical Engineers (ASME) *Code for Operation and Maintenance of Nuclear Power Plants (OM Code)*. By letters dated November 15, 2005, and June 29, 2006, TXU provided additional information related to Relief Request P-1.

2.0 REGULATORY EVALUATION

Section 50.55a of Title 10 of the *Code of Federal Regulations* (10 CFR) requires that IST of certain ASME Code Class 1, 2, and 3 pumps and valves be performed at 120-month (10-year) IST program intervals in accordance with the specified ASME Code incorporated by reference in the regulations, except where alternatives have been authorized or relief has been requested by the licensee and granted by the Commission pursuant to paragraphs (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a. In accordance with 10 CFR 50.55a(f)(4)(ii), licensees are required to comply with the requirements of the latest edition and addenda of the ASME Code incorporated by reference in the regulations 12 months prior to the start of each 120-month IST program interval. In accordance with 50.55a(f)(4)(iv), IST of pumps and valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in 10 CFR 50.55a(b), subject to the U.S. Nuclear Regulatory Commission (NRC) approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met. In proposing alternatives or requesting relief, the licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for the facility. Section 50.55a authorizes the Commission to approve alternatives and to grant relief from ASME Code requirements upon making necessary findings. NRC guidance contained in Generic Letter (GL) 89-04, “Guidance on Developing Acceptable Inservice Testing Programs,” provides alternatives to Code requirements which are acceptable. Further guidance

is given in GL 89-04, Supplement 1, and NUREG-1482, Revision 1, "Guidlines for Inservice Testing at Nuclear Power Plants."

At CPSES, the code of record for the second 10-year interval is the 1998 Edition up to and including the 2000 Addenda of the ASME OM Code.

3.0 TECHNICAL EVALUATION

3.1 Pump Relief Request P-1

3.1.1 Code Requirements

The licensee requested relief from ISTB-5121, which requires that the test parameters shown in Table ISTB-3000-1 shall be determined and recorded, and ISTB-5100(a), which requires that for the Group A test, after the pump conditions are stable as the system permits, each pump shall be run at least 2 minutes. Relief was requested for the following SBSPs:

CP1-WPAPSS-01	CP1-WPAPSS-02
CP1-WPAPSS-03	CP1-WPAPSS-04
CP2-WPAPSS-01	CP2-WPAPSS-02
CP2-WPAPSS-03	CP2-WPAPSS-04

3.1.2 Licensee's Basis for Requesting Relief

In its letter dated November 15, 2005, the licensee stated:

> The Safeguards Building Sump Pumps are required to detect and mitigate passive failures in the Emergency Core Cooing System (ECCS) and Containment Spray (CT) System post-LOCA [loss-of-coolant accident] and to prevent flooding of the safety related system.
>
> In the present design there is no recirculation line from the discharge header of the pumps back to the sumps and there are no installed pressure or differential pressure instruments on the pump suction or discharge. This creates some unique problems. Without a recirculation line on each pump discharge, there is only one way to maintain a constant differential pressure across the pump as required by ASME OM Code 1998 Edition, through 2000 Addenda, Subsection ISTB-5121, Group A Test Procedure. That way is to dead-head the pump, setting the reference flow at 0 gpm [gallons per minute], and calculating the differential. The differential pressure is determined by making elevation corrections to the discharge pressure reading which is read from a gauge installed in the available system vent connection. This vent connection is remotely located in a different room on a different floor elevation than the sump pumps. In addition to the fixed elevation corrections for the gauge location relative to the safeguard sump cover, an elevation is measured between the sump cover and the water surface within the sump and used to determine the final differential pressure. This procedure takes four test personnel to conduct the test in this manner. This test has proven to be

very difficult and operating experience (OE) and equipment history show that testing the pumps in a dead-head condition can cause equipment reliability concerns.

CPSES Inservice Testing Program is an approved Risk-Informed Inservice Testing (RI-IST) Program as described in the Safety Evaluation Report (TAC NOS. M94165, M94166, MA1972, and MA1973). There could be safety enhancements obtained by focusing resources on High Safety Significant Components (HSSCs). Extensive testing on Low Safety Significant Components (LSSCs) could have an adverse effect on safety. Reduction of testing should reduce component wear-out, operator burden, system unavailability, cost of testing, and radiation exposure. Reduced testing could also achieve a more optimum balance between the positive impacts of testing and the negative effects of disturbing equipment from service and entering a less than optimum plant configuration, such as valve misalignments. The CPSES Safeguards Building Sump Pumps have a low risk ranking and are tested every six years on a staggered test basis, such that at least two pumps are tested every 18 months.

To meet the operational readiness requirements for these pumps, a test should require that the pump start on the proper level switch actuation, determine that the pump is capable of delivering a minimum of 50 gpm to the Waste Holdup Tank, and that velocity-based vibration readings are satisfactory. Differential pressure is not needed to show adequate pump performance. Differential pressure measurement creates additional radiation exposure to personnel (ALARA) and potential equipment damage due to dead-heading the pump. Pumping 50 gpm or more to the Waste Holdup Tank demonstrates that an adequate head was developed to overcome system resistance and greater confidence exists that the ASME OM Code requirements for operational readiness have been met.

These pumps alert the operator of potential leakage in the Safeguards Building and mitigate the consequences of the leakage. To meet the testing requirements of ASME OM Code, Subsection ISTB, the pumps must be dead-headed for extended periods.

With the adoption of the 1989 ASME Boiler & Pressure Vessel Code Section XI (which endorsed the OM Part 6 & 10) and continuing in later Code editions, predictive maintenance techniques fundamentally changed. Prior to this edition of the Code, hydraulic performance (pressure, differential pressure, and flow) was the primary tool for detecting pump performance degradation. Currently, velocity-based vibration has proven to be much more sensitive to detecting degradation.

3.1.3 Licensee's Proposed Alternative Testing

In its letter dated November 15, 2005, the licensee stated:

> For the purpose of accomplishing Safeguards Building Sump Pump testing, the following requirements will apply:
>
> > The pumps shall be tested in accordance with ISTB-5121 and ISTB-5123 with the exception of waiting at least 2 minutes of pump run time for conditions to stabilize prior to recording test parameters (see ISTB-5100 (a) Duration of Tests) and the recording of differential pressure. The sump will be pumped down rapidly by one pump, and suction pressure will vary as sump level changes; therefore, the purpose of the stabilization time and differential pressure is not applicable in this case.
>
> Setting one hydraulic parameter (flow or differential pressure) at a reference point and measuring the other now serves to set the pump to a consistent "reference point" on the pump curve so that vibration data can be comparable from test to test. The same reference point and baseline can be achieved by filling up the sump to the same approximate level and pumping it to the same destination each time. There is a limited volume of water in the sump. The time to pump down the sump until the pump automatically secures is approximately 50 seconds providing ample time to collect vibration data. Flow and vibration readings would be just as consistent (valid) as setting a reference differential pressure and recording the data. This is done in less time, generating less waste, using less personnel and obtaining test data without dead-heading the pump. This test and flowpath is currently used (in addition to the pump dead head) in order to perform the open and close tests of the pump discharge check valves.
>
> A baseline reference will be established for flow and vibration; Alert and Required Action Limits will be set and maintained as specified by ASME OM Code ISTB, 1998 Edition, through 2000 Addenda. This alternative provides an acceptable level of quality and safety.

3.1.4 Evaluation

The SBSPs are installed to detect and mitigate passive failures in the ECCS and CT System post-LOCA and to prevent flooding of the safety-related system. In the present design, there is no recirculation line from the discharge header of the SBSPs back to the sumps and there are no installed on-line pressure and flow instruments on the pump suction or discharge. Without significant system and piping modifications, the licensee is unable to test the SBSPs in accordance with the OM Code requirements. Currently, CPSES is testing these pumps in a dead-head condition. Testing the pumps in a dead-head condition is not an acceptable test method, provides little or no useful information for assessing the conditions and operability of the pump, and may even cause pump degradation. Operating experience and equipment history also show that testing the pumps in a dead-head condition can cause equipment reliability concerns. Due to the reliability concerns, CPSES proposes an alternative test by filling up the

sump to the same approximate level and pumping into the same destination each time. The time to pump down the sump until the pump automatically secures is approximately 50 seconds, which provides ample time to collect vibration data. The proposed test requires starting the pump on the proper level switch actuation, and determines that the pump is capable of delivering a minimum of 50 gpm to the Waste Holdup Tank and that velocity-based vibration readings are satisfactory. The staff finds that compared to the dead-headed test, the proposed alternative will provide significantly improved assurance of the pump operability.

ISTB-5000 requires that for a Group A test, each pump be run at a specific reference point for at least 2 minutes, and at the end of this time at least one measurement or determination of each of the parameters required by Table ISTB-3000-1 shall be made, recorded, and compared to its reference value. Table ISTB-3400-1 requires a Group A test quarterly and a comprehensive test biennially. The intent of the OM Code is to determine the hydraulic and mechanical condition of a pump by comparing current conditions against a previous set of reference values. Deviations detected are symptoms of changes or degradations. The proposed test described in Relief Request P-1 does not prescribe a measurable and repeatable specific reference parameter, i.e., flow rate or pressure differential. Without a specific reference parameter, a pump test cannot be duplicated and deviations from previous tests cannot be determined and assessed. Therefore, the staff finds the proposed alternative inconsistent with the basic intent of the OM Code and unacceptable.

As discussed above, the Code-required test is impractical, because it cannot be performed without substantial plant modifications. The plant modifications would require time and planning, and compared with the present test, the proposed alternative would provide reasonable and improved assurance of pump operability without major degradation.

Based on its review, the NRC staff concludes that the Code-required test is impractical to perform without significant plant modifications, that the proposed alternative would provide reasonable assurance of pump operability without major degradation, and that the interim relief will allow time for the licensee to explore other alternatives, make necessary plant modifications for performing the required test, or submit a revised relief request.

4.0 CONCLUSION

Accordingly, pursuant to 10 CFR 50.55a(f)(6)(i), Relief Request P-1 is partially granted for an interim period of up to two refueling cycles but not to exceed 4 years. Granting the relief pursuant to 10 CFR 50.55a(f)(6)(i) is authorized by law and will not endanger life or property or 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. All other ASME Code requirements for which relief has not been specifically requested and authorized herein by the NRC staff remain applicable.

Principal Contributor: J. Huang

Date: September 27, 2006