



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

July 23, 2009

Mr. Rafael Flores  
Senior Vice President and  
Chief Nuclear Officer  
Luminant Generation Company LLC  
P.O. Box 1002  
Glen Rose, TX 76043

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION, UNITS 1 AND 2 – RELIEF  
REQUEST P-2, INSERVICE TESTING PLAN FOR PUMPS AND VALVES FOR  
SECOND 10-YEAR INTERVAL (TAC NOS. MD9722 AND MD9723)

Dear Mr. Flores:

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed and evaluated the information provided by Luminant Generation Company LLC (the licensee) in its letter dated September 24, 2008, as supplemented by letters dated December 9, 2008, and May 14, 2009. The licensee requested approval of Relief Request P-2 for Comanche Peak Steam Electric Station (CPSES), Units 1 and 2, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), paragraph 50.55a(a)(3)(i). The relief request relates to testing of the Safeguards Building Sump Pumps (SBSPs) for the second 10-year inservice testing (IST) interval.

Based on the information provided in the licensee's submittal, the NRC staff has determined that compliance with the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The proposed alternative test provides reasonable assurance of pump operability and that the SBSPs will perform their intended safety function.

Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), the proposed alternative is authorized for the second 10-year IST interval for CPSES, Units 1 and 2, which began on August 3, 2004, and ends on August 2, 2013.

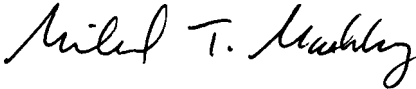
All other requirements of the ASME OM Code for which relief has not been specifically requested remain applicable, including a third-party review by the Authorized Nuclear Inservice Inspector.

R. Flores

- 2 -

The NRC safety evaluation is enclosed. If you have any questions, please contact Balwant K. Singal at 301-415-3016 or by e-mail at [Balwant.Singal@nrc.gov](mailto:Balwant.Singal@nrc.gov).

Sincerely,

A handwritten signature in black ink, reading "Michael T. Markley". The signature is written in a cursive style with a large, prominent "M" and "T".

Michael T. Markley, Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-445 and 50-446

Enclosure:  
As stated

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST NO. P-2

SECOND 10-YEAR INSERVICE TESTING INTERVAL

LUMINANT GENERATION COMPANY LLC

COMANCHE PEAK STEAM ELECTRIC STATION, UNITS 1 AND 2

DOCKET NOS. 50-445 AND 50-446

1.0 INTRODUCTION

By letter dated September 24, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML082770065), as supplemented by letters dated December 9, 2008, and May 14, 2009 (ADAMS Accession Nos. ML083540187 and ML091410446, respectively), Luminant Generation Company, LLC (the licensee), submitted Relief Request (RR) P-2 for the Safeguards Building Sump Pumps (SBSPs) from certain inservice testing (IST) requirements of the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants (OM Code) for Comanche Peak Steam Electric Station (CPSES), Units 1 and 2.

In its letter dated September 24, 2008, the licensee requested relief from ASME OM Code, Subsection ISTB, paragraphs ISTB-5100(a) and ISTB-5121. During its review, the U.S. Nuclear Regulatory Commission (NRC) staff noted that these paragraphs apply to the Centrifugal Pumps (except for Vertical Line Shaft Pumps). The RR is associated with SBSPs, which are Vertical Line Shaft Pumps, and the licensee should have requested relief from paragraphs ISTB-5200(a) and ISTB-5221. By letter dated May 14, 2009, the licensee made the correction to the original request. Also, the licensee provided its response to the NRC staff's request for additional information by letter dated December 9, 2008, without any change to the scope of the RR.

At CPSES, Units 1 and 2, the ASME OM Code of record for the second 10-year IST interval is the 1998 Edition up to and including the 2000 Addenda. The second 10-year IST interval for the CPSES, Units 1 and 2, began on August 3, 2004, and ends on August 2, 2013.

Enclosure

## 2.0 REGULATORY EVALUATION

Section 50.55, "Codes and standards," 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 10 CFR 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 Commission 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," dated April 3, 1989, provides alternatives to Code requirements that are acceptable. GL 89-04, Supplement 1, dated April 4, 1995, and NUREG-1482, Revision 1, "Guidelines for Inservice Testing at Nuclear Power Plants," dated January 2005, provide further guidance.

## 3.0 TECHNICAL EVALUATION

### 3.1 ASME Code Requirements

For Vertical Line Shaft Centrifugal Pumps, ISTB-5200(a)(1) requires that for the Group A test and the comprehensive test, after pump conditions are as stable as the system permits, each pump shall be run at least 2 minutes. At the end of this time, at least one measurement or determination of each of the quantities required by Table ISTB-3000-1 shall be made and recorded.

For the Group A Test Procedure, ISTB-5221 requires that Group A tests shall be conducted with the pump operating at a specified reference point and that the test parameters shown in Table ISTB-3000-1 shall be determined and recorded as required by this paragraph.

Relief was requested for the following SBSPs:

CP1-WPAPSS-01	CP1-WPAPSS-03	CP2WPAPSS-01	CP2WPAPSS-03
CP1-WPAPSS-02	CP1-WPAPSS-04	CP2WPAPSS-02	CP2WPAPSS-04

### 3.2 Licensee's Basis for Requesting Relief

In its letter dated May 14, 2009, the licensee stated that:

The reason for relief from ISTB-5200(a) is the Safeguards Building sump does not contain sufficient water inventory for 2 minutes duration at 80% or greater of design flow. The sump pumps are not designed with a recirculation line (mini-flow or test header) that allows a pump to be run continuously at the design flow conditions.

The reason for relief from ISTB-5221 is there are no plant-installed pressure or differential pressure instruments on the suction or discharge of the pump.

Previously the SBSPs were tested by setting flow at 0 gpm [gallons per minute] (i.e. dead head the pump) and differential pressure was calculated. The suction pressure was calculated by measuring an elevation between the sump cover and water level within the sump. This method was abandoned due to ALARA [as low as reasonably achievable] concerns of the sump being potentially contaminated.

The test method of dead heading the SBSPs is adverse to the condition of the pumps and is no longer performed. Interim relief was granted by the NRC (TAC NOS. MC5385 and MC5386) on testing in compliance with ISTB-5100 and ISTB-5121 to explore other alternatives. The interim relief should have referenced testing in compliance with ISTB-5200 and ISTB-5221. The design of the SBSPs has been reviewed and it was determined that significant plant modifications would have to be performed without any appreciable benefit to safety to enable testing in compliance with ASME OM ISTB-5200 and ISTB-5221.

### 3.3 Licensee's Proposed Alternative Testing

In its letter dated May 14, 2009, the licensee stated that:

To meet the operational readiness requirements for these pumps, a test can be performed that demonstrates the pump can meet its intended safety functions. This test would 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 have velocity-based vibration readings that are satisfactory. Differential pressure measurement is not required to show adequate pump performance. Differential pressure measurement creates additional radiation exposure to personnel (ALARA) because the sump is potentially contaminated. Pumping 50 gpm or more to the Waste Holdup Tank demonstrates that adequate head was developed to overcome system resistance with greater confidence that the ASME OM Code requirements, for operational readiness have been met. The required head to pump to the Waste Holdup Tank is greater than the required head to discharge to the Floor Drain Tank which is the normal lineup.

The proposed test consists of the following. [The discharge of the sump pumps will be aligned to the Waste Holdup Tank]. The sump will be filled to a

predetermined level and the pump will operate until the automatic low-level cutoff switch actuates. The sump will be pumped down rapidly (approximately 50 seconds) by one pump. Suction pressure will vary as sump level changes; therefore, the 2 minute stabilization time and differential pressure measurements are not achievable. The test will require pumping the same quantity of fluid along a repeatable system path while measuring flow and vibration. A baseline reference shall be established for flow and vibration [ ]. Alert and Required Action Limits for vibration will be established and maintained as per Table ISTB-5200-1 for vertical line shaft centrifugal pumps. The acceptance criteria for flow will be greater than the design flow of 50 gpm. The flowrate delivered will be trended for detecting pump degradation and to ensure the SBSPs have adequate design margin.

Pump flow rate will be measured using a portable ultrasonic flow measurement instrument. Potential variations in system resistance that could affect the repeatability of the test will be procedurally controlled to assure that valve line-ups are verified and other pumps are not contributing additional flow sources.

### 3.4 NRC Staff Evaluation

The SBSPs detect and mitigate passive failures in the emergency core cooling system and containment spray system following a loss-of-coolant accident and prevent flooding of the safety-related systems.

ISTB-5221 requires that testing be performed where either pump flow or differential pressure is set and the other parameters measured, recorded, and compared to its reference value. Deviations between the measured value and the reference value are symptoms of pump degradation. In the present design, there is no recirculation line from the discharge header back to the sumps and there are no installed on-line pressure and flow instruments on the pump suction or discharge. Imposing the Code-required test would result in significant hardship for the licensee because it would require major piping modifications and installation of on-line pressure and flow instruments in potentially contaminated sump areas. Therefore, the licensee proposes to control the test procedure and establish a repeatable system pressure profile such that pump degradation can be determined through flow rate and vibration measurements.

The proposed alternative test requires each pump to start at the proper level switch actuation, discharge a quantity of water to the Waste Holdup Tank, and to shut off at the proper low-level switch. Flow rate will be measured using a portable ultrasonic flow measurement device. The flow path to the Waste Holdup Tank will be procedurally controlled to assure proper valve line-up and that no other pumps are contributing flow to the system so that repeatability of the test can be assured. The flow path to the Waste Holdup Tank has a greater system resistance due to piping configuration and, therefore, testing by using the flow path to the Waste Holdup Tank is a more stringent test to verify the design flow rate of 50 gpm.

Reductions in flow rate can be attributed to either degradation of the pump or the discharge check valves. Degradation of the discharge check valves could result in a change of the flow rate. The test procedure is also used to perform open and closed tests of the discharge check

valves. Therefore, failure to meet the flow requirement or trends of degradation in flow will result in evaluation of the condition or repair of the pumps or discharge check valves.

The NRC staff finds that the proposed alternative test provides a reasonable level of assurance that the SBSPs will perform their intended safety function, and imposing the Code-required test would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety. The proposed alternative is, therefore, acceptable.

#### 4.0 CONCLUSION

Based on the above evaluation, the NRC staff has determined that compliance with the Code requirements for the SBSPs would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety, and that the proposed alternative would provide reasonable assurance of pump operability. Therefore, Relief Request P-2 is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the second 10-year IST program interval.

All other requirements of the ASME OM Code for which relief has not been specifically requested remain applicable, including a third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: Y. Huang

Date: July 23, 2009

R. Flores

- 2 -

The NRC safety evaluation is enclosed. If you have any questions, please contact Balwant K. Singal at 301-415-3016 or by e-mail at Balwant.Singal@nrc.gov.

Sincerely,

*/RA/*

Michael T. Markley, Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-445 and 50-446

Enclosure:  
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**ADAMS Accession No: ML091620548** SE memo dated 4/28/09 \*with suggested comments

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