

August 9, 2000

Mr. C. Lance Terry  
Senior Vice President  
& Principal Nuclear Officer  
TXU Electric  
Attn: Regulatory Affairs Department  
P. O. Box 1002  
Glen Rose, Texas 76043

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION, UNITS 1 AND 2 - REQUEST  
TO REVISE REACTOR PRESSURE VESSEL SURVEILLANCE PROGRAM  
CAPSULE WITHDRAWAL SCHEDULE (TAC NOS. MA8497 AND MA8498)

Dear Mr. Terry:

By letter dated March 21, 2000, TXU Electric (the licensee) submitted its revised reactor pressure vessel surveillance capsule withdrawal schedule for Comanche Peak Steam Electric Station (CPSES), Units 1 and 2. The revised reactor pressure vessel surveillance capsule withdrawal schedule was based on the American Society for Testing and Materials (ASTM) E 185-70 recommendations. The purpose of the licensee's submittal was to provide more effective surveillance capsule withdrawal schedules for CPSES, Units 1 and 2. Specifically, proposed withdrawal schedules were prepared to reflect the delay in withdrawing the second capsule in Unit 2, delay in withdrawing the third capsule for both units, and deletion of the requirement to withdraw a fourth capsule from both units for the duration of their current, respective, operating licenses.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the licensee's submittal, referenced above, and noted that the proposed withdrawal and testing schedules of the capsules are in accordance with the recommendations of ASTM E 185-70. The NRC staff has independently verified that the proposed withdrawal schedules for the reactor pressure vessel surveillance capsules comply with the requirements of Title 10 of the *Code of Federal Regulations*, Part 50, Appendix H. The NRC staff's safety evaluation is enclosed.

Sincerely,  
**/RA/**

Robert A. Gramm, Chief, Section 1  
Project Directorate IV & Decommissioning  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-445 and 50-446

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO REACTOR PRESSURE VESSEL SURVEILLANCE PROGRAM

CAPSULE WITHDRAWAL SCHEDULE

FACILITY OPERATING LICENSE NOS. NPF-87 AND NPF-89

TXU ELECTRIC

COMANCHE PEAK STEAM ELECTRIC STATION, UNITS 1 AND 2

DOCKET NOS. 50-445 AND 50-446

1.0 INTRODUCTION

By letter dated March 21, 2000, TXU Electric (the licensee) submitted its revised reactor pressure vessel (RPV) surveillance capsule withdrawal schedule for Comanche Peak Steam Electric Station (CPSES), Units 1 and 2. The revised RPV surveillance capsule withdrawal schedule was based on the American Society for Testing and Materials (ASTM) E 185-70 recommendations. The purpose of the licensee's submittal was to provide more effective surveillance capsule withdrawal schedules for CPSES, Units 1 and 2. Specifically, proposed withdrawal schedules were prepared to reflect the delay in withdrawing the second capsule in Unit 2, delay in withdrawing the third capsule for both units, and deletion of the requirement to withdraw a fourth capsule from both units for the duration of their current, respective, operating licenses.

2.0 BACKGROUND

The RPV surveillance programs for CPSES, Units 1 and 2, were implemented to monitor the radiation-induced changes in the mechanical and impact properties of the RPV materials. The surveillance program for CPSES, Units 1 and 2, are discussed in the Pressure and Temperature Limits Report for each of the units, dated July 1999. This surveillance program was established in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix H.

Appendix H to 10 CFR Part 50, "Reactor Vessel Material Surveillance Program Requirements," requires licensees to monitor changes in the fracture toughness properties of ferritic materials in the reactor vessel beltline region of light water nuclear power reactors. Appendix H states that the design of the surveillance program and the withdrawal schedule must meet the requirements of the edition of ASTM E 185 that is current on the issue date of the American Society of Mechanical Engineers (ASME) Code to which the reactor vessel was purchased. Later editions of ASTM E 185 may be used, including those editions through 1982.

The RPV surveillance program for each of the CPSES units was initially established in accordance with ASTM E 185-70, which was the edition of the ASTM standard that was in

effect on the issue date of Section III of the ASME Boiler and Pressure Vessel Code (1971), to which the CPSES, Units 1 and 2, reactor vessels were fabricated. The original "withdrawal strategy" called for removing four of the six installed surveillance capsules in each of the CPSES units.

The surveillance capsule withdrawal schedule and testing criteria for ASTM E 185-70 recommends that sets of specimens be withdrawn at three or more separate times. It specifically recommends that one of the data points obtained shall correspond to the neutron exposure of the reactor vessel at no greater than 30 percent of its design life. There is no specific requirement for when the data point shall be obtained for the second capsule, and the third data point obtained shall correspond to the neutron exposure of the reactor vessel near the end of its design life.

### 3.0 EVALUATION

For the revised program, the licensee has opted to continue to use the ASTM E 185-70 standard in determining the number of capsules to be withdrawn and the schedule for withdrawing and testing the capsules of the CPSES, Units 1 and 2, RPV surveillance program. As stated previously, ASTM E 185-70 recommends that three capsules are to be withdrawn at three or more separate times.

#### CPSES, Unit 1

The estimated peak end of life (EOL) fluence for CPSES, Unit 1, is  $3.04 \times 10^{19}$  neutrons per square centimeter ( $n/cm^2$ ). Currently, the licensee has withdrawn two capsules for CPSES, Unit 1. The first capsule (Capsule U) was removed and tested from the vessel at 0.9 effective full power years (EFPY) with an accumulated neutron fluence of  $3.7 \times 10^{18} n/cm^2$ . This meets the recommendation of ASTM E 185-70 for the first capsule to be withdrawn and tested. As stated above, ASTM E 185-70 recommends that one of the data points obtained shall correspond to the neutron exposure of the reactor vessel at no greater than 30 percent of its design life. The second capsule (Capsule Y) was removed and tested from the vessel at 6.25 EFPYs. This meets the ASTM E 185-70 recommendation of the second capsule to be withdrawn and tested, since there is no specific requirement for when the data point shall be obtained for the second capsule. Finally, the third capsule (Capsule X) is scheduled to be withdrawn and tested at 13 EFPY, which will also meet the recommendation of ASTM E 185-70 for the third capsule. The recommendation of ASTM E 185-70 for the third capsule is that the third data point obtained shall correspond to the neutron exposure of the reactor vessel near the end of its design life. In addition, the licensee has a standby capsule (Capsule V) for CPSES, Unit 1.

The NRC staff has concluded that the proposed capsule withdrawal and testing schedule for the capsules of the CPSES, Unit 1, RPV surveillance program is in accordance with the recommendations of ASTM E 185-70 without the need to withdraw additional surveillance capsules, beyond the third capsule. The NRC staff has also concluded that the proposed withdrawal schedule for the capsules of the CPSES, Unit 1, RPV surveillance program complies with the requirements of 10 CFR Part 50, Appendix H.

## CPSES, Unit 2

The estimated peak EOL fluence for CPSES, Unit 2, is  $3.04 \times 10^{19}$  n/cm<sup>2</sup>. Currently, the licensee has withdrawn one capsule for CPSES, Unit 2. The first capsule (Capsule U) was removed from the RPV and tested at 0.9 EFPY with an accumulated neutron fluence of  $3.28 \times 10^{18}$  n/cm<sup>2</sup>. This meets the recommendation of ASTM E 185-70 for the first capsule to be withdrawn and tested. As stated above, ASTM E 185-70 recommends that one of the data points obtained shall correspond to the neutron exposure of the reactor vessel at no greater than 30 percent of its design life. The second capsule (Capsule X) is scheduled to be removed from the RPV and tested at 8 EFPY. This will meet the ASTM E 185-70 recommendation for the second capsule to be withdrawn and tested, since there is no specific requirement for when the data point shall be obtained for the second capsule. Finally, the third capsule (Capsule W) is scheduled to be withdrawn and tested at 14 EFPYs, which will also meet the recommendation of ASTM E 185-70 for the third capsule. The recommendation of ASTM E 185-70 for the third capsule is that the third data point obtained shall correspond to the neutron exposure of the reactor vessel near the end of its design life. In addition, the licensee has two standby capsules (Capsules Y and V) for CPSES, Unit 2.

The NRC staff has concluded that the proposed capsule withdrawal and testing schedule for the capsules of the CPSES, Unit 2, RPV surveillance program is in accordance with the recommendations of ASTM E 185-70 without the need for withdrawal of additional surveillance capsules, beyond the third capsule. The NRC staff has also concluded that the proposed withdrawal schedule for the capsules of the CPSES, Unit 2, RPV surveillance program complies with the requirements of 10 CFR Part 50, Appendix H.

## 4.0 CONCLUSION

Based on the NRC staff's review of the licensee's submittal, the NRC staff found that the revised withdrawal schedules, for the CPSES, Units 1 and 2, RPVs, satisfy the requirements of Appendix H to 10 CFR Part 50, and are therefore acceptable to the NRC staff.

## 5.0 REFERENCES

1. Letter from Mr. C. L. Terry (TXU) to NRC Document Control Desk, "Comanche Peak Steam Electric Station, Docket Nos. 50-445 and 50-446, Revision to the Reactor Vessel Material Surveillance Program Withdrawal Schedule," dated March 21, 2000.
2. *Code of Federal Regulations*, Title 10, Part 50, Appendix H, "Reactor Vessel Material Surveillance Program Requirements," dated January 1998.
3. American Society for Testing and Materials, "Standard Recommended Practice for Surveillance Tests for Nuclear Reactor Vessels," ASTM E 185-70.
4. NUREG-1511, "Reactor Pressure Vessel Status Report," dated December 1994.

Principal Contributor: M. Khanna

Date: August 9, 2000

Comanche Peak Steam Electric Station

cc:

Senior Resident Inspector  
U.S. Nuclear Regulatory Commission  
P. O. Box 2159  
Glen Rose, TX 76403-2159

Regional Administrator, Region IV  
U.S. Nuclear Regulatory Commission  
611 Ryan Plaza Drive, Suite 400  
Arlington, TX 76011

Mrs. Juanita Ellis, President  
Citizens Association for Sound Energy  
1426 South Polk  
Dallas, TX 75224

Mr. Roger D. Walker  
Regulatory Affairs Manager  
TXU Electric  
P. O. Box 1002  
Glen Rose, TX 76043

George L. Edgar, Esq.  
Morgan, Lewis & Bockius  
1800 M Street, N.W.  
Washington, DC 20036-5869

Honorable Dale McPherson  
County Judge  
P. O. Box 851  
Glen Rose, TX 76043

Office of the Governor  
ATTN: John Howard, Director  
Environmental and Natural  
Resources Policy  
P. O. Box 12428  
Austin, TX 78711

Arthur C. Tate, Director  
Division of Compliance & Inspection  
Bureau of Radiation Control  
Texas Department of Health  
1100 West 49th Street  
Austin, TX 78756-3189

Jim Calloway  
Public Utility Commission of Texas  
Electric Industry Analysis  
P. O. Box 13326  
Austin, TX 78711-3326