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Ref: 10CFR50.90

CPSES-200601734
Log # TXX-06146
File # 00236

August 31, 2006

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NOS. 50-445 AND 50-446
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
RELATED TO LICENSE AMENDMENT REQUEST 05-007,
REVISION TO TECHNICAL SPECIFICATION 5.6.6 REGARDING
PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)
TAC NOS. MC9500 AND MC9501

REF: 1) TXU Power letter, logged TXX-05198, from Mike Blevins to the
U. S. Nuclear Regulatory Commission, dated December 16, 2005.

Dear Sir or Madam:

In Reference 1, TXU Generating Company LP (TXU Power) submitted a proposed amendment which would revise the CPSES Technical Specifications (TS) requirements consistent with the NRC-approved Revision 0 to Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-419, "Revise PTLR Definition and References in ISTS 5.6.6, RCS PTLR."

Based on questions provided by Mr. Mohan Thadani of the NRC in an email dated June 23, 2006, TXU Power hereby provides additional information regarding LAR 05-007. The NRC questions and TXU Power's response immediately following each question are provided in Attachment 1 to this letter. Enclosure 1 of this letter contains an updated 'sample' PTLR. Enclosure 2 of this letter contains the non-proprietary version of document WCAP-16346, "Comanche Peak Units 1 and 2 Heatup and Cooldown Limit Curves for Normal Operation" as requested by NRC staff.

A member of the **STARS** (Strategic Teaming and Resource Sharing) Alliance

Callaway • Comanche Peak • Diablo Canyon • Palo Verde • South Texas Project • Wolf Creek

DO29

This communication contains no new or revised commitments.

Should you have any questions, please contact Mr. Bob Kidwell at (254) 897-5310.

In accordance with 10CFR50.91(b), TXU Power is providing the State of Texas with a copy of this proposed amendment.

I state under penalty of perjury that the foregoing is true and correct.

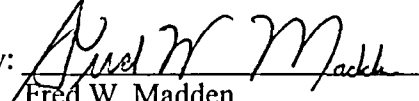
Executed on August 31, 2006

Sincerely,

TXU Generation Company LP

By: TXU Generation Management Company LLC
Its General Partner

Mike Blevins

By: 
Fred W. Madden
Director, Regulatory Affairs

RJK

Attachment 1. TXU Power Response to Request for Additional Information

Enclosures 1. Sample Pressure and Temperature Limits Report (PTLR)
2. WCAP-16346-NP; "Comanche Peak Units 1 and 2 Heatup and
Cooldown Limit Curves for Normal Operation"

c - B. S. Mallett, Region IV (w/o Encl)
M. C. Thadani, NRR (w/o Encl)
Resident Inspectors, CPSES (w/o Encl)

Ms. Alice Rogers (w/o Encl)
Bureau of Radiation Control
Texas Department of Public Health
1100 West 49th Street
Austin, Texas 78756-3189

ATTACHMENT 1 to TXX-06146

**TXU POWER RESPONSE TO
REQUEST FOR ADDITIONAL INFORMATION**

**LICENSE AMENDMENT REQUEST 05-007
REVISION TO TECHNICAL SPECIFICATION 5.6.6 REGARDING
PRESSURE AND TEMPERATURE LIMITS REPORT (PTLR)
COMANCHE PEAK UNITS 1 AND 2
TXU GENERATION COMPANY, LP
TAC NOS. MC9500 AND MC9501**

Question 1

The PTLR attached to your submittal is labeled as a "sample." Please confirm whether you have an active PTLR and provide the actual PTLR that you intend to use for this application.

Response:

Comanche Peak currently uses the Pressure Temperature Limits Report for each unit; however, the current reports merely contain the information relocated from the affected Technical Specifications. The content is not consistent with GL 96-03 nor are the reported values based on the approved methodology of WCAP-14040-NP-A Revision 4.

The sample PTLR, attached to the License Amendment Request, and re-submitted as part of the responses to these Questions, is intended to be formally issued as the CPSES PTLR upon approval of License Amendment Request 05-007. A single PTLR will be issued to bound both CPSES units.

Question 2

Generic Letter (GL) 96-03 requires that: (1) a PTLR shall identify both the limiting adjusted reference temperature (ART) values and limiting materials at the 1/4t and 3/4t locations and (2) a PTLR for pressurized water reactors (PWRs) shall identify the reactor pressure vessel's (RPV's) limiting reference temperature (RTPTS) value in accordance with Title 10 of Code of Federal Regulations Part 50, 50.61. Please revise your PTLR to include the limiting ART values and limiting materials at the 1/4t and 3/4t locations for Unit 2. Further, the RPVs' limiting RTPTS values for both units shall also be included in the PTLR. Lastly, it appears that you propose to use one set of pressure-temperature (P/T) limits to bound those for both units. If this is the case, a footnote on PTLR Figures 2-1 and 2-2 to indicate this approach would clarify your intention.

Response:

- (1) The revised PTLR, attached to these responses, identifies the limiting ART value and material at the 1/4t and 3/4t locations for each reactor vessel.
- (2) The RTPTS values and bases for each unit are included in the revised PTLR, attached to these responses.
- (3) An appropriate notation to include the suggested information has been added to Figures 2-1 and 2-2 of the revised PTLR, included with these responses.

Question 3

The title for Figure 2-2 contains an editorial error. The word "Heatup" in the title should be revised to "Cooldown."

Response:

The title has been corrected in the revised PTLR, included with these responses.

Question 4

This is the first time that you adopted a specific P/T limit methodology to generate the proposed P/T limits for Comanche Peak Units 1 and 2. The staff needs to review Reference 4 of the PTLR, i.e., WCAP-16346-NP, "Comanche Peak Units 1 and 2 Heatup and Cooldown Limit Curves for Normal Operation," to verify that the methodology of WCAP-14040-NP-A, Revision 4, has been implemented appropriately.

Response:

WCAP-16346-NP is enclosed to facilitate the review of this License Amendment Request.

ERX-05-00x, Draft Rev. B

S A M P L E

COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)

PRESSURE AND TEMPERATURE LIMITS REPORT

(APPLICABLE UP TO 36 EFPY)

Month 200x

Prepared: _____
Engineer
Safety Analysis

Date: _____

Approved: _____
Manager
Safety Analysis Manager

Date: _____

Approved: _____
Manager
Technical Programs Manager

Date: _____

**Pressure and Temperature Limits Report for Comanche Peak Steam Electric Station
(Applicable Up To 36 EFPY)**

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Pressure and Temperature Limits Report for Comanche Peak Steam Electric Station
(Applicable Up To 36 EFPY)

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Pressure and Temperature Limits Report for Comanche Peak Steam Electric Station
(Applicable Up To 36 EFPY)

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(Applicable Up To 36 EFPY)**

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**Pressure and Temperature Limits Report for Comanche Peak Steam Electric Station
(Applicable Up To 36 EFPY)**

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1.0 INTRODUCTION

This report presents the Reactor Coolant System (RCS) Pressure and Temperature (P/T) limits for Comanche Peak Steam Electric Station (CPSES) Unit 1 and Unit 2 in accordance with the requirements of Technical Specification 5.6.6. A description of the Low Temperature Overpressure Protection (LTOP) System power-operated relief valve (PORV) setpoints is also provided in this report. In addition, the requirements of the reactor vessel material surveillance program are discussed.

The following two Technical Specification Limiting Conditions of Operation (LCO) are addressed in this report:

LCO 3.4.3 RCS Pressure and Temperature (P/T) Limits

LCO 3.4.12 Low Temperature Overpressure Protection (LTOP) System

The analytical methods used to determine the RCS pressure and temperature limits are described in Reference 1. The methods used to develop the LTOP System PORV setpoints are also described in Reference 1.

This report covers CPSES Unit 1 and Unit 2 operation for 36 Effective Full Power Years (EFPY).

**Pressure and Temperature Limits Report for Comanche Peak Steam Electric Station
(Applicable Up To 36 EFPY)**

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2.0 OPERATING LIMITS

RCS P/T Limits

The RCS P/T limits presented in this report consist of the RCS (except the pressurizer) temperature rate-of-change limits and P/T limits during heatup, cooldown, inservice leak and hydrostatic testing, and criticality. The P/T limits for both CPSES units are based on the approved methodology presented in Reference 1.

The RCS P/T limits are based on the results of the evaluations of the most recently analyzed reactor vessel specimen capsules as presented in References 2 and 3 for Units 1 and 2, respectively. The more limiting material is used to develop RCS P/T limits that bound both CPSES units.

The RCS P/T limits calculated for selected heatup and cooldown rates for CPSES Unit 1 and Unit 2 are extracted from Reference 4.

LTOP System

The LTOP System acts as a backup to the reactor operators to mitigate RCS pressurization transients at low temperatures so the integrity of reactor coolant pressure boundary (RCPB) is not compromised by violating the pressure and temperature limits of Appendix G of 10 CFR 50. The reactor vessel is the limiting RCPB component for demonstrating such protection.

The LTOP System provides reduced setpoints for the pressurizer Power-Operated Relief Valves (PORVs) as a function of the RCS temperature. The methodology used to select the setpoint pressures is described in Reference 1. Allowances for instrument uncertainties have been included in the development of these setpoints.

The LTOP System PORV setpoints for CPSES Unit 1 (with the replacement $\Delta 76$ steam generators) are extracted from Reference 6. The LTOP System PORV setpoints developed for CPSES Unit 1 (with the original D4 steam generators) and Unit 2 are extracted from Reference 5.

**Pressure and Temperature Limits Report for Comanche Peak Steam Electric Station
(Applicable Up To 36 EFPY)**

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REACTOR VESSEL MATERIAL SURVEILLANCE PROGRAM

The reduction in toughness that results from neutron radiation is measured as an increase in the Nil Ductility Reference Temperature (RT_{NDT}) and reduction of the upper-shelf energy of reactor vessel bellline materials, including welds. At CPSES, these quantities were predicted at 36 EFPY using the methods of WCAP-14040-NP-A, Revision 4 [1]. The predictions showed that the materials in the Unit 1 and Unit 2 reactor vessels responded similarly to neutron irradiation but at 36 EFPY, the plate material in the Unit 1 bellline was most limiting. Forecast properties of the limiting material were used to establish P/T limits for heatup and cooldown curves and LTOP setpoints.

The reactor vessel specimen capsules are withdrawn when the projected neutron fluence would exceed one-times the projected end-of-life vessel fluence and less than two-times the projected end-of-life vessel fluence, in accordance with Reference 5.

For Unit 1, the required specimen capsules U and Y have been withdrawn and evaluated [2]. The third required specimen capsule, Capsule X, was withdrawn during 1RF11 in the fall of 2005, with a fluence within the range of one-times to two-times the 52 EFPY Peak Fluence [2], but has not yet been evaluated. Two of the standby capsules (Capsules V and W) were withdrawn in 1RF09 and stored for later evaluation, if necessary. The third standby capsule was withdrawn during 1RF11 in the fall of 2005 and stored for later evaluation, if necessary. Because all reactor vessel surveillance capsules have been withdrawn and stored, a capsule removal schedule is not required for Unit 1.

For Unit 2, the required specimen capsules U and X have been withdrawn and evaluated [3]. The third required specimen capsule, Capsule W, is scheduled to be withdrawn during 2RF11 in the spring of 2010, with a fluence within the range of one-times to two-times the 54 EFPY Peak Fluence [3]. The schedule for the third capsule withdrawal differs from the specific recommendations contained in Reference 3, but satisfies the requirements of Reference 5 based on an expected end-of-life fluence corresponding to the 54 EFPY Peak Fluence. Two of the standby capsules (Capsules V and Y) were withdrawn in 2RF07 and stored for later evaluation, if necessary. The third standby capsule is scheduled to be withdrawn during 2RF11

Pressure and Temperature Limits Report for Comanche Peak Steam Electric Station
(Applicable Up To 36 EFPY)

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in the spring of 2010 and stored for later evaluation, if necessary.

2.1 RCS Temperature Rate-of-Change Limits (LCO 3.4.3)

2.1.1 Maximum Heatup Rate

The RCS heatup rate limit is 100°F in any 1-hour period.

2.1.2 Maximum Cooldown Rate

The RCS cooldown rate limit is 100°F in any 1-hour period.

2.1.3 Maximum Temperature Change During Inservice Leak and Hydrostatic Testing

During inservice leak and hydrostatic testing operations above the heatup and cooldown limit curves, the RCS temperature change limit is 10°F in any 1-hour period.

2.2 P/T Limits for Heatup, Cooldown, Inservice Leak & Hydrostatic Testing, and Criticality (LCO 3.4.3)

The limiting materials and adjusted reference temperatures at the 1/4t and 3/4t locations for each unit's reactor vessel are extracted from Reference 4 and are presented in Table 2-4. The limiting reference temperatures for pressurized thermal shock (RT_{PTS}) values for each unit's reactor vessel were previously docketed in accordance with 10CFR50.61 and are extracted from References 8 and 9 for presentation in Table 2-4. Analyses of the withdrawn surveillance capsules from the Unit 1 and Unit 2 reactor vessels have confirm the similarity between the two vessels in irradiated and non-irradiated material properties. The results of these surveillance capsule evaluations have confirmed that the early projections for CPSES vessel materials were conservative. In addition, the majority of the irradiation-induced shift in vessel material properties occurs early in life. Therefore, with substantial margin to the RT_{PTS} screening criteria, the conservative fluence projections for the CPSES vessel materials, and the absence of a significant change in the projected values of RT_{PTS} , the Pressurized Thermal Shock reports have not been revised.

**Pressure and Temperature Limits Report for Comanche Peak Steam Electric Station
(Applicable Up To 36 EFPY)**

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2.2.1 P/T Limits for Heatup, Inservice Leak & Hydrostatic Testing, and Criticality

The P/T limits for heatup, inservice leak & hydrostatic testing, and criticality, based on the limiting material from the Unit 1 and Unit 2 reactor vessels, are specified in Figure 2-1.

2.2.2 P/T Limits for Cooldown

The P/T limits for cooldown, based on the limiting material from the Unit 1 and Unit 2 reactor vessels, are specified in Figure 2-2.

2.3 LTOP System Setpoints (LCO 3.4.12)

The nominal PORV setpoints for use with the Low Temperature Overpressure (LTOP) System are shown in Table 2-1 and Table 2-2. The PORV setpoints in Table 2-1 are applicable to Unit 1 with the replacement (Model $\Delta 76$) steam generators. The PORV setpoints in Table 2-2 are applicable to *Unit 1 with original (Model D4) steam generators and for Unit 2 with original (Model D5) steam generators*. The replacement steam generator design has a larger RCS volume and a larger primary-to-secondary heat transfer area than the original steam generator designs.

2.4 Reactor Vessel Material Surveillance Program

A withdrawal schedule for Unit 1 is not necessary, because all Unit 1 surveillance capsules have been withdrawn from the reactor vessel. The reactor vessel material surveillance capsule withdrawal schedule for Unit 2 is provided in Table 2-3.

**Pressure and Temperature Limits Report for Comanche Peak Steam Electric Station
(Applicable Up To 36 EFPY)**

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3.0 REFERENCES

1. "Methodology used to Develop Cold Overpressure Mitigating System Setpoints and RCS Heatup and Cooldown Limit Curves," WCAP-14040-NP-A, Revision 4, May, 2004.
2. "Analysis of Capsule Y from the TU Electric Company Comanche Peak Unit 1 Reactor Vessel Radiation Surveillance Program," WCAP-15144-NP, Revision 0, January, 1999.
3. "Analysis of Capsule X from the TU Energy Comanche Peak Unit 2 Reactor Vessel Radiation Surveillance Program," WCAP-16277-NP, Revision 0, September, 2004.
4. "Comanche Peak Units 1 and 2 Heatup and Cooldown Limit Curves for Normal Operation," WCAP-16346-NP, Revision 0, October 2004.
5. ASTM E 185-82, A Standard Practice for Conducting Surveillance Tests for Light-Water Cooled Nuclear Power Reactor Vessels, E706 (IF).≡
6. COMS Setpoints for Unit 1 RSG (Later)
7. COMS Setpoints for Unit 1 and Unit 2 OSG (Later)
8. "Evaluation of Pressurized Thermal Shock for Comanche Peak Unit 1," WCAP-13437, docketed via TXU Electric letter logged TXX-92516, December 28, 1992.
9. "Evaluation of Pressurized Thermal Shock for Comanche Peak Unit 2," WCAP-14345, docketed via TXU Electric letter logged TXX-95243, dated September 19, 1995.

**Pressure and Temperature Limits Report for Comanche Peak Steam Electric Station
(Applicable Up To 36 EFPY)**

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**Table 2-1: Limiting Materials and Reference Temperatures for CPSES Unit 1 and
Unit 2 Reactor Vessels**

Unit	Limiting Material	Adjusted Reference Temperature (ART)		Reference Temperature – Pressurized Thermal Shock (RT-PTS)
		1/4t	3/4t	
1	R-1107-1, Intermediate Shell Plate	92°F	80°F	100°F
2	R-3807-2, Intermediate Shell Plate	84°F	69°F	94°F

**Table 2-2: PORV Setpoints for Low Temperature Overpressure (LTOP) System For
Unit 1 Replacement Steam Generators - Applicable Up To 36 EFPY**

Adjusted RCS Temperature (°F)	PORV #1 Setpoint (psig)	PORV #2 Setpoint (psig)
70	425	573
380	425	573
470	2335	2335

**Pressure and Temperature Limits Report for Comanche Peak Steam Electric Station
(Applicable Up To 36 EFPY)**

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**Table 2-3: PORV Setpoints for Low Temperature Overpressure (LTOP) System For
Unit 1 Original Steam Generators and Unit 2 with Original Steam
Generators - Applicable Up To 36 EFPY**

Adjusted RCS Temperature (°F)	PORV #1 Setpoint (psig)	PORV #2 Setpoint (psig)
70	450	580
380	450	580
470	2335	2335

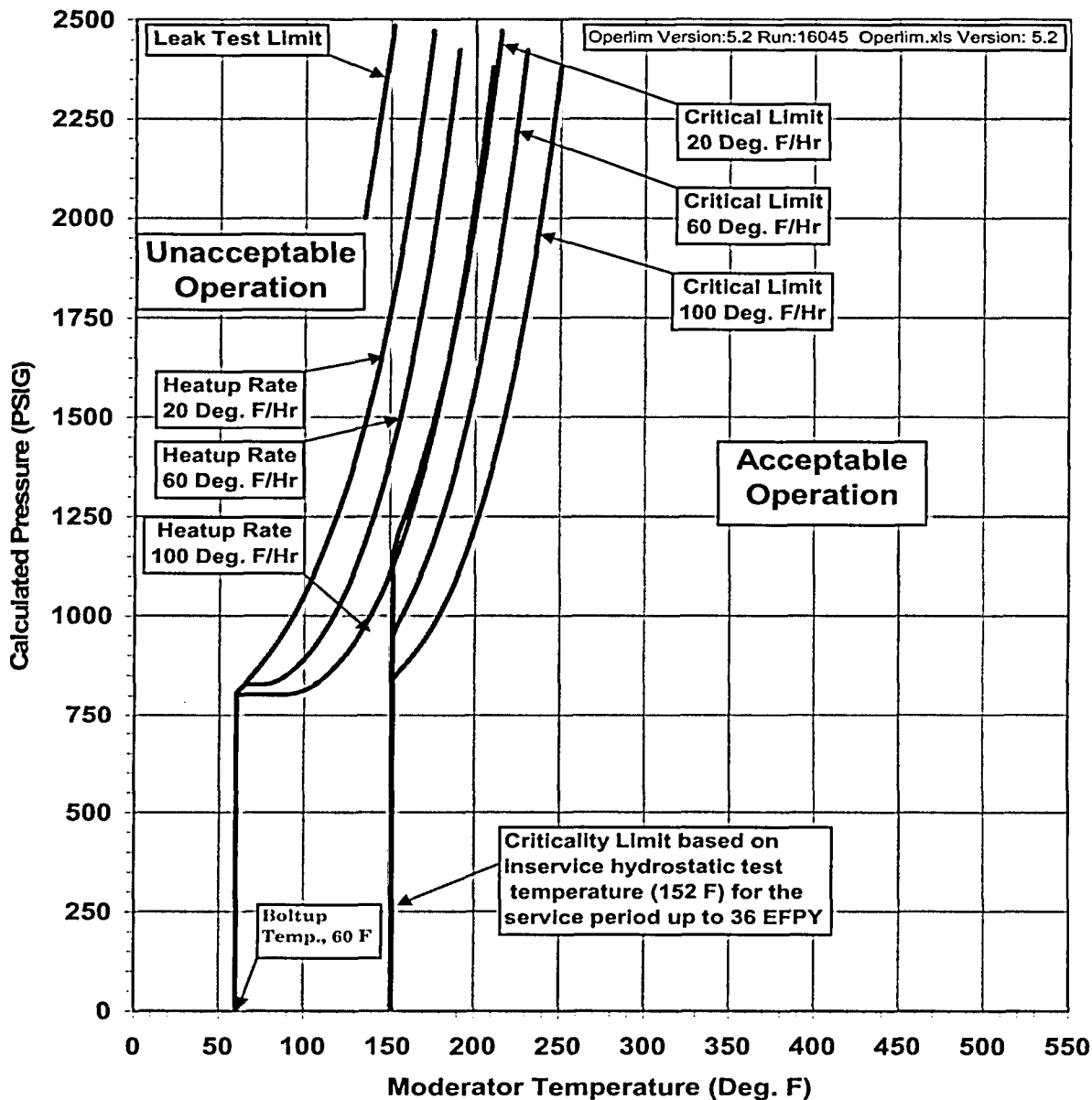
**Table 2-4: Unit 2 Reactor Vessel Material Surveillance Program - Withdrawal
Schedule**

<u>CAPSULE NUMBER</u>	<u>VESSEL LOCATION</u>	<u>LEAD FACTOR</u>	<u>WITHDRAWAL TIME</u>	<u>WITHDRAWAL OUTAGE</u>
U	58.5°	3.93	1 st Refueling	1 st Refueling
X	238.5°	4.15	8.83 EFPY	2RF07
W	121.5°	4.11	13 EFPY	2RF11
Z	301.5°	4.11	Standby	2RF11
V	61.0°	3.87	Standby	2RF07
Y	241.0°	3.87	Standby	2RF07

Pressure and Temperature Limits Report for Comanche Peak Steam Electric Station
(Applicable Up To 36 EFPY)

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Figure 2-1 Reactor Coolant System Heatup Limitations for CPSES Unit 1 and Unit 2 -
Applicable for the First 36 EFPY



Pressure and Temperature Limits Report for Comanche Peak Steam Electric Station
(Applicable Up To 36 EFPY)

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Figure 2-2 Reactor Coolant System Cooldown Limitations for CPSES Unit 1 and Unit 2 -
Applicable for the First 36 EFPY

