

VISTRA ENERGY



Timothy A. Hope
Manager, Regulatory Affairs
Luminant
P.O. Box 1002
6322 North FM 56
Glen Rose, TX 76043
o 254.897.6370

CP-201800310
TXX-18034

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Ref 10 CFR 50.46(a)(3)(ii)

6/19/2018

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT
DOCKET NOS. 50-445 AND 50-446
ANNUAL REPORT OF CHANGES IN PEAK CLADDING TEMPERATURE

- REFERENCES:
1. Letter logged TXX-12146, dated October 18, 2012, from Rafael Flores of Luminant Power to the NRC regarding "30-Day Report for Significant Change in Peak Clad Temperature"
 2. Letter logged TXX-14058, dated April 22, 2014, from Rafael Flores of Luminant Power to the NRC regarding "30-Day Report for Significant Change in Peak Clad Temperature"

Dear Sir or Madam:

Pursuant to 10CFR50.46(a)(3)(ii), Vistra Operations Company LLC (Vistra OpCo) hereby submits the attached peak cladding temperatures (PCT) for Comanche Peak Nuclear Power Plant (CPNPP), Units 1 and 2. The Large-Break Loss-of-Coolant-Accident (LBLOCA) and Small-Break Loss-of-Coolant Accident (SBLOCA) analyses for Units 1 and 2 were performed for CPNPP with the approved Westinghouse methodologies listed in Technical Specification 5.6.5. Per Reference 1, Vistra OpCo previously submitted information regarding fuel pellet thermal conductivity with fuel burnup in the Westinghouse Best Estimate LBLOCA analysis methodology for CPNPP Units 1 and 2. Also, per Reference 2, Vistra OpCo submitted information regarding an evaluation of revised Heat Transfer Multiplier Distributions, changes to Grid Blockage Ratio and Porosity, and application of a corrected Burst Strain in the Westinghouse Best Estimate LBLOCA analysis methodology for CPNPP Unit 2 and its effect on Peak Cladding Temperature (PCT).

Vistra OpCo has reviewed the notification of 10CFR50.46 reporting information pertaining to the Emergency Core Cooling System (ECCS) Evaluation Model changes that were implemented by Westinghouse for 2017. The review concludes that the effect of additional changes to, or errors in, the Evaluation Models on the limiting transient PCT were not significant for 2017.

ADD2
NRR

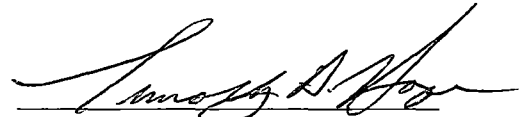
This report of the ECCS Evaluation Model changes provides an update on an annual basis. Attachment 1 provides an assessment of the specific changes and enhancements to the Westinghouse Evaluation Models for 2017.

Attachment 2 provides the calculated LBLOCA and SBLOCA PCT margin allocations in effect for the 2017 Comanche Peak Units 1 and 2 Evaluation Models. There were no changes, error corrections, or enhancements to the 1985 Westinghouse Small Break Loss-of-Coolant Accident Evaluation Model with NOTRUMP. The PCT values determined in the LBLOCA analysis of record, combined with all of the PCT allocations, remain well below the 10CFR50.46 regulatory limit of 2200 degrees Fahrenheit. Therefore, CPNPP Units 1 and 2 are in compliance with 10CFR50.46 requirements and no other action is required.

This communication contains no new commitments regarding CPNPP Units 1 and 2.

Should you have any questions, please contact Ken Vehstedt at (254) 897-6296.

Sincerely,



Timothy A. Hope

- Attachments
1. Assessments of Specific Changes and Enhancements to the Westinghouse Evaluation Models
 2. CPNPP Units 1 and 2 Peak Cladding Temperatures

c - Kriss Kennedy, Region IV
Margaret M. O'Banion, NRR
Resident Inspectors, Comanche Peak

GENERAL CODE MAINTENANCE

Background

Various changes have been made to enhance the usability of codes and to streamline future analyses. Examples of these changes include modifying input variable definitions, units and defaults; improving the input diagnostic checks; enhancing the code output; optimizing active coding; and eliminating inactive coding.

These changes represent Discretionary Changes that will be implemented on a forward-fit basis in accordance with Section 4.1.1 of WCAP-13451.

Affected Evaluation Model(s)

1996 Westinghouse Best-Estimate Large Break LOCA Evaluation Model
2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM
1981 Westinghouse Large Break LOCA Evaluation Model with BASH
1985 Westinghouse Small Break LOCA Evaluation Model with NOTRUMP

Estimated Effect

The nature of these changes leads to an estimated Peak Cladding Temperature (PCT) impact of 0°F.

COMANCHE PEAK UNIT 2 CYCLE 17 PBOT/PMID VIOLATIONS

Background

The Comanche Peak Unit 2 Cycle 17 reload core design resulted in several violations of the PBOT/PMID box used in the Large Break LOCA analysis. These violations were evaluated for Comanche Peak Unit 2 Cycle 17 operation.

This item represents a change in plant configuration or associated set points, distinguished from an evaluation model change in Section 4 of WCAP-13451.

Affected Evaluation Model(s)

2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM

Estimated Effect

The impact of the PBOT/PMID violations for Comanche Peak Unit 2 Cycle 17 was determined via a plant-specific evaluation to be 0°F.

ERROR IN THE UPPER PLENUM FLUID VOLUME CALCULATION

Background

An error was found in the fluid volume calculation in the upper plenum where the support column outer diameter was being used instead of the inner diameter. The correction of this error lead to a reduction in the upper plenum fluid volume used in the Appendix K Large Break LOCA and Small Break LOCA analyses. The corrected values represent a less than 1% change in the total RCS fluid volume and will be incorporated on a forward-fit basis, based on the evaluated impact on the current licensing basis analysis results.

These changes represent a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

Affected Evaluation Model(s)

1981 Westinghouse Large Break LOCA Evaluation Model with BASH.

1985 Westinghouse Small Break LOCA Evaluation Model with NOTRUMP

Estimated Effect

The differences in the upper plenum fluid volume are relatively minor and have been evaluated to have a negligible effect on large and small break LOCA analysis results, leading to an estimated PCT impact of 0°F.

COMANCHE PEAK UNIT 1 CYCLE 20 PBOT/PMID VIOLATION

Background

The Comanche Peak Unit 1 Cycle 20 reload core design resulted in several violations of the PBOT/PMID box used in the Large Break LOCA Analysis. These violations were evaluated for Comanche Peak Unit 1 Cycle 20 operation.

This item represents a change in plant configuration or associated set point, distinguished from an evaluation model change in Section 4 of WCAP-13451.

Affected Evaluation Model(s)

2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM

Estimated Effect

The impact of the PBOT/PMID violation for Comanche Peak Unit 1 Cycle 20 was determined via a plant-specific evaluation to be 0°F.

INCONSISTENT APPLICATION OF NUMERICAL RAMP APPLIED TO THE ENTRAINED LIQUID / VAPOR INTERFACIAL DRAG COEFFICIENT

Background

A numerical ramp which was used to account for the disappearance of the entrained liquid phase was applied to the entrained liquid / vapor interfacial drag coefficient. The numerical ramp was applied such that the interfacial drag coefficient used in the solution of the entrained liquid and vapor momentum equations was not consistent. WCOBRA/TRAC was updated to apply the numerical ramp prior to usage of the interfacial drag coefficient in the momentum equations, such that a consistent interfacial drag coefficient was used in the entrained liquid and vapor momentum equations.

This item represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

Affected Evaluation Model(s)

1996 Westinghouse Best Estimate Large Break LOCA Evaluation Model
2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM

Estimated Effect

Based on the code validation results, the impact of correcting the error is estimated to have a 0°F impact on PCT.

INAPPROPRIATE RESETTING OF TRANSVERSE LIQUID MASS FLOW

Background

In the WCOBRA/TRAC routine which evaluates the mass and energy residual error of the time step solution, the transverse liquid mass flow is reset as the liquid phase disappears. The routine is updated to remove the resetting of the transverse liquid mass flow since the routine is to only evaluate the residual error based on the time step solution values.

This item represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

Affected Evaluation Model(s)

1996 Westinghouse Best Estimate Large Break LOCA Evaluation Model
2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM

Estimated Effect

Based on the code validation results and limited applicability of the logic removed, correcting the error is estimated to have a 0°F impact on PCT.

STEADY-STATE FUEL TEMPERATURE CALIBRATION METHOD

Background

In the Automated Statistical Treatment of Uncertainty Method (ASTRUM) Best-Estimate (BE) Large-Break Loss-of-Coolant Accident (LBLOCA) Evaluation Model (EM), the steady-state fuel pellet temperature calibration method involves solving for the hot gap width (AGFACT) to calibrate the fuel temperature for each fuel rod. In some infrequent situations, small non-conservatism can occur in the calibration process such that the resulting fuel pellet temperature will be slightly lower than intended and outside the acceptable range defined by Table 12-6 of WCAP-16009-P/NP-A [1].

This issue has been evaluated to estimate the impact on ASTRUM BE LBLOCA analysis results. The resolution of this issue represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

Affected Evaluation Model(s)

2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM

Estimated Effect

A review of licensing basis analyses concluded that the potential non-conservatism in the fuel pellet temperature calibration did not occur for the limiting analysis cases. Therefore, an estimated PCT impact of 0°F is assigned for 10 CFR 50.46 reporting purposes.

Reference(s)

1) WCAP-16009-P/NP-A, "Realistic Large-Break LOCA Evaluation Methodology Using the Automated Statistical Treatment Of Uncertainty Method (ASTRUM)," January 2005.

**Westinghouse LOCA Peak Clad Temperature Summary for ASTRUM
Best Estimate Large Break**

Plant Name: Comanche Peak Unit 1
Utility Name: Luminant
Revision Date: 2/1/2018

Analysis Information

EM:	ASTRUM (2004)	Analysis Date:	7/27/2007	Limiting Break Size:	Guillotine
FQ:	2.5	FdH:	1.6		
Fuel:	OFA	SGTP (%):	10		
Notes:					

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1492	1	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1. Evaluation of Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown	122	2	(a)
2. Revised Heat Transfer Multiplier Distributions	-6	3	
3. Error in Burst Strain Application	21	4	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1. None	0		
C. 2017 ECCS MODEL ASSESSMENTS			
1. None	0		
D. OTHER			
1. None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	PCT = 1629		

References

1. WCAP-16762-P, Revision 1, "Best-Estimate Analysis of the Large-Break Loss-of-Coolant Accident for the Comanche Peak Nuclear Power Plant Unit 1 Using the ASTRUM Methodology," March 2009.
2. LTR-LIS-12-410, "Comanche Peak Units 1 and 2, 10 CFR 50.46 Notification and Reporting for Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown," September 20, 2012.
3. LTR-LIS-13-359, "Comanche Peak Units 1 and 2 10 CFR 50.46 Report for Revised Heat Transfer Multiplier Distributions," July 2013.
4. LTR-LIS-14-43, "Comanche Peak Units 1 and 2 10 CFR 50.46 Report for the HOTSPOT Burst Strain Error Correction," January 2014.

Notes:

- (a) This evaluation credits peaking factor burndown, see Reference 2.

Westinghouse LOCA Peak Clad Temperature Summary for ASTRUM Best Estimate Large Break

Plant Name: Comanche Peak Unit 1
Utility Name: Luminant **Cycle 20**
Revision Date: 2/1/2018

Analysis Information

EM: ASTRUM (2004) **Analysis Date:** 7/27/2007 **Limiting Break Size:** Guillotine
FQ: 2.5 **FdH:** 1.6
Fuel: OFA **SGTP (%):** 10
Notes:

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1492	1	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1. Evaluation of Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown	122	3	(a)
2. Revised Heat Transfer Multiplier Distributions	-6	4	
3. Error in Burst Strain Application	21	5	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1. PBOT/PMID Violation	0	2	
C. 2017 ECCS MODEL ASSESSMENTS			
1. None	0		
D. OTHER			
1. None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	PCT = 1629		

References

1. WCAP-16762-P, Revision 1, "Best-Estimate Analysis of the Large-Break Loss-of-Coolant Accident for the Comanche Peak Nuclear Power Plant Unit 1 Using the ASTRUM Methodology," March 2009.
2. LTR-LIS-17-322, "10 CFR 50.46 Reporting Text and LBLOCA PCT Rackup Update for the Evaluation of the Comanche Peak Unit 1 Cycle 20 PBOT/PMID Violations," September 2017.
3. LTR-LIS-12-410, "Comanche Peak Units 1 and 2, 10 CFR 50.46 Notification and Reporting for Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown," September 20, 2012.
4. LTR-LIS-13-359, "Comanche Peak Units 1 and 2 10 CFR 50.46 Report for Revised Heat Transfer Multiplier Distributions," July 2013.
5. LTR-LIS-14-43, "Comanche Peak Units 1 and 2 10 CFR 50.46 Report for the HOTSPOT Burst Strain Error Correction," January 2014.

Notes:

(a) This evaluation credits peaking factor burndown, see Reference 3.

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Small Break

Plant Name: Comanche Peak Unit 1
Utility Name: Luminant
Revision Date: 2/1/2018

Analysis Information

EM: NOTRUMP **Analysis Date:** 6/8/2007 **Limiting Break Size:** 4 inch
FQ: 2.5 **FdH:** 1.6
Fuel: OFA **SGTP (%):** 10
Notes:

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1013	1	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1. None	0		
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1. None	0		
C. 2017 ECCS MODEL ASSESSMENTS			
1. None	0		
D. OTHER			
1. None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	PCT = 1013		

References

1. WCAP-16840-P, "Comanche Peak Nuclear Power Plant Stretch Power Uprate Licensing Report," August 2007. (Results are included in TXX-07107, "Comanche Peak Steam Electric Station (CPSES), Docket Nos. 50-445 and 50-446, Submittal of the CPSES Units 1 and 2 Large and Small Break LOCA Analyses," July 31, 2007.)

Notes:

None

Westinghouse LOCA Peak Clad Temperature Summary for ASTRUM Best Estimate Large Break

Plant Name: Comanche Peak Unit 2
Utility Name: Luminant
Revision Date: 2/1/2018

Analysis Information

EM: ASTRUM (2004) **Analysis Date:** 7/27/2007 **Limiting Break Size:** Guillotine
FQ: 2.5 **FdH:** 1.6
Fuel: OFA **SGTP (%):** 10
Notes:

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1632	1	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1. Evaluation of Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown	190	2	(a)
2. Revised Heat Transfer Multiplier Distributions	-17	3	
3. Changes to Grid Blockage Ratio and Porosity	24	4	
4. Error in Burst Strain Application	21	5	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1. None	0		
C. 2017 ECCS MODEL ASSESSMENTS			
1. None	0		
D. OTHER			
1. None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	PCT = 1850		

References

1. WCAP-16763-P, Revision 1, "Best-Estimate Analysis of the Large-Break Loss-of-Coolant Accident for the Comanche Peak Nuclear Power Plant Unit 2 Using the ASTRUM Methodology," March 2009.
2. LTR-LIS-12-410, "Comanche Peak Units 1 and 2, 10 CFR 50.46 Notification and Reporting for Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown," September 20, 2012.
3. LTR-LIS-13-359, "Comanche Peak Units 1 and 2 10 CFR 50.46 Report for Revised Heat Transfer Multiplier Distributions," July 2013.
4. LTR-LIS-13-472, "Comanche Peak Units 1 and 2 10 CFR 50.46 Reports for Changes to Grid Blockage Ratio and Porosity," October 2013.
5. LTR-LIS-14-43, "Comanche Peak Units 1 and 2 10 CFR 50.46 Report for the HOTSPOT Burst Strain Error Correction," January 2014.

Notes:

- (a) This evaluation credits peaking factor burndown, see Reference 2.

Westinghouse LOCA Peak Clad Temperature Summary for ASTRUM Best Estimate Large Break

Plant Name: Comanche Peak Unit 2
Utility Name: Luminant **Cycle 16**
Revision Date: 2/1/2018 **Retired**

Analysis Information

EM: ASTRUM (2004) **Analysis Date:** 7/27/2007 **Limiting Break Size:** Guillotine
FQ: 2.5 **FdH:** 1.6
Fuel: OFA **SGTP (%):** 10
Notes:

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1632	1	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1. Evaluation of Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown	190	3	(a)
2. Revised Heat Transfer Multiplier Distributions	-17	4	
3. Changes to Grid Blockage Ratio and Porosity	24	5	
4. Error in Burst Strain Application	21	6	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1. PBOT & PMID Evaluation	0	2	
C. 2017 ECCS MODEL ASSESSMENTS			
1. None	0		
D. OTHER			
1. None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	PCT = 1850		

References

1. WCAP-16763-P, Revision 1, "Best-Estimate Analysis of the Large-Break Loss-of-Coolant Accident for the Comanche Peak Nuclear Power Plant Unit 2 Using the ASTRUM Methodology," March 2009.
2. LTR-LIS-15-317, "LBLOCA PCT Rackup Sheet Update for the Evaluation of the Comanche Peak Unit 2 Cycle 16 PBOT/PMID Violations," September 2015.
3. LTR-LIS-12-410, "Comanche Peak Units 1 and 2, 10 CFR 50.46 Notification and Reporting for Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown," September 20, 2012.
4. LTR-LIS-13-359, "Comanche Peak Units 1 and 2 10 CFR 50.46 Report for Revised Heat Transfer Multiplier Distributions," July 2013.
5. LTR-LIS-13-472, "Comanche Peak Units 1 and 2 10 CFR 50.46 Reports for Changes to Grid Blockage Ratio and Porosity," September 2013.
6. LTR-LIS-14-43, "Comanche Peak Units 1 and 2 10 CFR 50.46 Report for the HOTSPOT Burst Strain Error Correction," January 2014.

Notes:

- (a) This evaluation credits peaking factor burndown, see Reference 3.

Westinghouse LOCA Peak Clad Temperature Summary for ASTRUM Best Estimate Large Break

Plant Name: Comanche Peak Unit 2 **Cycle 17**
Utility Name: Luminant
Revision Date: 2/1/2018

Analysis Information

EM: ASTRUM (2004) **Analysis Date:** 7/27/2007 **Limiting Break Size:** Guillotine
FQ: 2.5 **FdH:** 1.6
Fuel: OFA **SGTP (%):** 10
Notes:

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	632	1	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1. Evaluation of Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown	190	3	(a)
2. Revised Heat Transfer Multiplier Distributions	-17	4	
3. Changes to Grid Blockage Ratio and Porosity	24	5	
4. Error in Burst Strain Application	21	6	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1. PBOT/PMID Violation	0	2	
C. 2017 ECCS MODEL ASSESSMENTS			
1. None	0		
D. OTHER			
1. None	0		
 LICENSING BASIS PCT + PCT ASSESSMENTS PCT = 1850			

References

1. WCAP-16763-P, Revision 1, "Best-Estimate Analysis of the Large-Break Loss-of-Coolant Accident for the Comanche Peak Nuclear Power Plant Unit 2 Using the ASTRUM Methodology," March 2009.
2. LTR-LIS-17-124, "10 CFR 50.46 Reporting Text and LBLOCA PCT Rackup Update for the Evaluation of the Comanche Peak Unit 2 Cycle 17 PBOT/PMID Violations," March 2017.
3. LTR-LIS-12-410, "Comanche Peak Units 1 and 2, 10 CFR 50.46 Notification and Reporting for Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown," September 20, 2012.
4. LTR-LIS-13-359, "Comanche Peak Units 1 and 2 10 CFR 50.46 Report for Revised Heat Transfer Multiplier Distributions," July 2013.
5. LTR-LIS-13-472, "Comanche Peak Units 1 and 2 10 CFR 50.46 Reports for Changes to Grid Blockage Ratio and Porosity," September 2013.
6. LTR-LIS-14-43, "Comanche Peak Units 1 and 2 10 CFR 50.46 Report for the HOTSPOT Burst Strain Error Correction," January 2014.

Notes:

(a) This evaluation credits peaking factor burndown, see Reference 3.

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Small Break

Plant Name: Comanche Peak Unit 2
Utility Name: Luminant
Revision Date: 2/1/2018

Analysis Information

EM: NOTRUMP **Analysis Date:** 6/8/2007 **Limiting Break Size:** 4 inch
FQ: 2.5 **FdH:** 1.6
Fuel: OFA **SGTP (%):** 10
Notes:

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1210	1	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1. None	0		
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1. None	0		
C. 2017 ECCS MODEL ASSESSMENTS			
1. None	0		
D. OTHER			
1. None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	PCT = 1210		

References

1. WCAP-16840-P, "Comanche Peak Nuclear Power Plant Stretch Power Uprate Licensing Report," August 2007. (Results are included in TXX-07107, "Comanche Peak Steam Electric Station (CPSES), Docket Nos. 50-445 and 50-446, Submittal of the CPSES Units 1 and 2 Large and Small Break LOCA Analyses," July 31, 2007.)

Notes:

None