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CP-200800213
Log # TXX-08025

Ref. # 10CFR50.90

February 26, 2008

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

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION
DOCKET NOS. 50-445 AND 50-446
SUPPLEMENT TO LICENSE AMENDMENT REQUEST (LAR) 07-004
REVISION TO THE OPERATING LICENSE AND TECHNICAL SPECIFICATION 1.0, "USE AND APPLICATION" TO REVISE RATED THERMAL POWER FROM 3458 MWT TO 3612 MWT. (TAC NOS. MD6615 AND MD6616)

REFERENCES:
1. Letter logged TXX-07106 dated August 28, 2007 from Mike Blevins to the NRC submitting License Amendment Request (LAR) 07-004, proposing revisions to the Operating Licenses and to Technical Specifications 1.0, "USE AND APPLICATION" to revise rated thermal power from 3458 MWT to 3612 MWT

2. Letter logged TXX-08008 dated January 10, 2008 from Mike Blevins to the NRC submitting a supplement to License Amendment Request (LAR) 07-004

3. Letter logged TXX-08013 dated January 31, 2008 from Mike Blevins to the NRC submitting a supplement to License Amendment Request (LAR) 07-004

4. Letter logged TXX-08031 dated February 21, 2008 from Mike Blevins to the NRC submitting a supplement to License Amendment Request (LAR) 07-004

Dear Sir or Madam:

Per Reference 1, Luminant Generation Company LLC (Luminant Power) requested changes to the Comanche Peak Steam Electric Station, herein referred to as Comanche Peak Nuclear Power Plant (CPNPP), Units 1 and 2 Operating Licenses and to Technical Specification 1.0, "USE AND APPLICATION" to revise rated thermal power from 3458 MWT to 3612 MWT. Luminant Power supplemented that request by responding to NRC Requests for Additional Information (RAI) per References 2, 3, and 4.

Reference 4 identified that responses to Mechanical and Civil Engineering Branch questions 12, 13, and 14 contain proprietary information and would be provided under separate cover letter. This letter provides the response to these questions in Attachment 1.

A001
NRR

Attachment 1 contains information proprietary to Westinghouse Electric Company LLC, and is supported by an affidavit signed by Westinghouse, the owner of the information. Attachment 2 is the non-proprietary version of Attachment 1. The enclosed affidavit sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b) (4) of Section 2.390 of the Commissions' regulations. Accordingly, it is respectfully requested that the information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations.

The proprietary information transmitted in this letter is consistent with the proprietary information originally transmitted in Reference 1, and includes the following:

Question 12: Table 12c, Table 12d, Table 2.2.2.5-10, and Table 2.2.2.5-11

Question 13: Table 2.2.3-4, Table 2.2.3-5, and Table 2.2.3-6

Question 14: Bracketed text

Proprietary information is indicated in [brackets], followed by a superscript code. The codes are defined as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

Correspondence with respect to the copyright or proprietary aspects of Attachment 1 or the supporting Westinghouse affidavit should reference CAW-08-2388 and should be addressed to J. A. Gresham, Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company LLC, P.O. Box 355, Pittsburgh, Pennsylvania 15230-0355.

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

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

Should you have any questions, please contact Mr. J. D. Seawright at (254) 897-0140.

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

Executed on February 26, 2008.

Sincerely,

Luminant Generation Company LLC

Mike Blevins

By: Fred W. Madden
Director, Oversight & Regulatory Affairs

Attachment - 1 Response to Request for Additional Information (Proprietary)
2 Response to Request for Additional Information (Non-Proprietary)
3 Westinghouse authorization letter CAW-08-2384 with accompanying affidavit, Proprietary Information Notice and Copyright Notice.

c - E. E. Collins, Region IV
B. K. Singal, NRR
Resident Inspectors, Comanche Peak

Ms. Alice Rogers
Environmental & Consumer Safety Section
Texas Department of State Health Services
1100 West 49th Street
Austin, Texas 78756-3189

ATTACHMENT 2 TO TXX-08025

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION MECHANICAL AND CIVIL ENGINEERING BRANCH (EMCB)

NRC Question 12:

The SPULR notes that various ASME Class 1 components have failed to meet the primary plus secondary stress intensity requirement of 3Sm (ASME Section III, Paragraph NB-3222.2) but have been found acceptable as they have met alternate subparagraphs of ASME Code, Section III, Subsection NB.

a) For these components discuss the basis that allows usage of each of the alternate subparagraphs quoted in the SPULR.
b) Provide summaries of the evaluations which show that the special rules and requirements for exceeding 3Sm as provided by the alternate subparagraphs have been met.
c) Show values in tables where reference to notes is made without the provision of values, including Tables 2.2.2.5-10 and 2.2.2.5-11.
d) For tables containing structural integrity values only at SPU conditions, include similar values at current licensing conditions.

For the above 12a through 12d requests, include components from the following tables:

- **Reactor Vessel and Supports Tables 2.2.2.3-1 and 2.2.2.3-2**
- **Control Rod Drive Mechanism Table 2.2.2.4-1**
- **SGs and Supports Table 2.2.2.5-10 and Table 2.2.2.5-11**
- **Pressurizer and Supports Table 2.2.2.7-2**
- **Reactor Pressure Vessel Internals and Core Supports Table 2.2.3-6**

Response 12

Note that the responses to RAI 12 are grouped by component as listed in the above bullets. Each response section begins on a new page.

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Table 12a

Maximum Range of Stress Intensity and Cumulative Fatigue Usage Factors for CPSES Unit 1

Location	Maximum Range of Stress intensity		Cumulative Fatigue Usage Factor	
	Pre-SPU (ksi)	SPU (ksi)	Pre-SPU	SPU
CRDM Housings	63.4 $< 3S_m = 69.9$	63.4 $< 3S_m = 69.9$	0.174 < 1.0	0.174 < 1.0
Closure Head/Flange	64.0 $< 3S_m = 80.1$	64.0 $< 3S_m = 80.1$	0.081 < 1.0	0.081 < 1.0
Vessel Flange	50.3 $< 3S_m = 80.1$	50.3 $< 3S_m = 80.1$	0.045 < 1.0	0.045 < 1.0
Closure Studs	94.9 $< 2.7S_m = 99.6$	94.9 $< 2.7S_m = 99.6$	0.594 < 1.0	0.594 < 1.0
Vessel Wall Transition	56.3 $< 3S_m = 80.1$	56.3 $< 3S_m = 80.1$	0.022 < 1.0	0.022 < 1.0
Outlet Nozzles and Support Pads	Outlet Nozzle Safe End 44.4 $< 3S_m = 52.3$ Outlet Nozzle 75.4 $< 3S_m = 80.1$ Support Pad 46.4 $< 3S_m = 80.1$	Outlet Nozzle Safe End 44.4 $< 3S_m = 52.3$ Outlet Nozzle 75.4 $< 3S_m = 80.1$ Support Pad 46.4 $< 3S_m = 80.1$	Outlet Nozzle 0.328 < 1.0 Support Pad 0.025 < 1.0	Outlet Nozzle 0.328 < 1.0 Support Pad 0.025 < 1.0
Inlet Nozzles and Support Pads	Inlet Nozzle Safe End 42.0 $< 3S_m = 52.3$ Inlet Nozzle 66.7 $< 3S_m = 80.1$ Support Pad 61.4 $< 3S_m = 80.1$	Inlet Nozzle Safe End 42.0 $< 3S_m = 52.3$ Inlet Nozzle 66.7 $< 3S_m = 80.1$ Support Pad 61.4 $< 3S_m = 80.1$	Inlet Nozzle 0.112 < 1.0 Support Pad 0.030 < 1.0	Inlet Nozzle 0.112 < 1.0 Support Pad 0.030 < 1.0
Core Support Pads (Lower Radial Keys)	43.2 $< 3S_m = 80.1$ (Wall) 43.2 $< 3S_m = 69.9$ (Pad)	43.2 $< 3S_m = 80.1$ (Wall) 43.2 $< 3S_m = 69.9$ (Pad)	0.117 < 1.0	0.117 < 1.0
Bottom Head to Shell Juncture	41.8 $< 3S_m = 80.1$	41.8 $< 3S_m = 80.1$	0.012 < 1.0	0.012 < 1.0
Bottom-Mounted Instrumentation tube (BMI)	70.1[(1)] $> 3S_m = 69.9$ 68.6[(1)] $< 3S_m = 69.9$	70.1[(1)] $> 3S_m = 69.9$ 68.6[(1)] $< 3S_m = 69.9$	0.409 < 1.0	0.409 < 1.0

Note:

1. The maximum range of stress intensity for the BMI tube is justified by using simplified elastic-plastic analysis methods per Subsection NB-3228.3 of the ASME B&PV Code. The maximum range excluding thermal bending was determined to be 68.6 ksi in the original stress report.

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Table 12b
Maximum Range of Stress Intensity and Cumulative Fatigue Usage Factors for CPSES Unit 2

Location	Maximum Range of Stress intensity		Cumulative Fatigue Usage Factor	
	Pre-SPU (ksi)	SPU (ksi)	Pre-SPU	SPU
CRDM Housings	$59.0 < 3S_m = 69.9$	$59.0 < 3S_m = 69.9$	$0.184 < 1.0$	$0.192 < 1.0$
Closure Head/Flange	$55.7 < 3S_m = 80.1$	$55.7 < 3S_m = 80.1$	$0.041 < 1.0$	$0.041 < 1.0$
Vessel Flange	$50.3 < 3S_m = 80.1$	$50.3 < 3S_m = 80.1$	$0.045 < 1.0$	$0.045 < 1.0$
Closure Studs	$94.9 < 2.7S_m = 99.6$	$94.9 < 2.7S_m = 99.6$	$0.594 < 1.0$	$0.594 < 1.0$
Vessel Wall Transition	$56.3 < 3S_m = 80.1$	$56.3 < 3S_m = 80.1$	$0.022 < 1.0$	$0.022 < 1.0$
Outlet Nozzles and Support Pads	Outlet Nozzle Safe End $44.4 < 3S_m = 52.3$ Outlet Nozzle $75.4 < 3S_m = 80.1$ Support Pad $46.4 < 3S_m = 80.1$	Outlet Nozzle Safe End $44.4 < 3S_m = 52.3$ Outlet Nozzle $75.4 < 3S_m = 80.1$ Support Pad $46.4 < 3S_m = 80.1$	Outlet Nozzle $0.399^{(2)} < 1.0$ Support Pad $0.023 < 1.0$	Outlet Nozzle $0.369^{(2)} < 1.0$ Support Pad $0.027 < 1.0$
Inlet Nozzles and Support Pads	Inlet Nozzle Safe End $42.0 < 3S_m = 52.3$ Inlet Nozzle $66.7 < 3S_m = 80.1$ Support Pad $61.4 < 3S_m = 80.1$	Inlet Nozzle Safe End $42.0 < 3S_m = 52.3$ Inlet Nozzle $66.7 < 3S_m = 80.1$ Support Pad $61.4 < 3S_m = 80.1$	Inlet Nozzle $0.112 < 1.0$ Support Pad $0.028 < 1.0$	Inlet Nozzle $0.115 < 1.0$ Support Pad $0.032 < 1.0$
Core Support Pads (Lower Radial Keys)	$43.2 < 3S_m = 80.1$ (Wall) $43.2 < 3S_m = 69.9$ (Pad)	$43.2 < 3S_m = 80.1$ (Wall) $43.2 < 3S_m = 69.9$ (Pad)	$0.155^{(2)} < 1.0$	$0.117^{(2)} < 1.0$
Bottom Head to Shell Juncture	$41.8 < 3S_m = 80.1$	$41.8 < 3S_m = 80.1$	$0.012 < 1.0$	$0.012 < 1.0$
Bottom-Mounted Instrumentation tube (BMI)	$70.1^{(1)} > 3S_m = 69.9$ $68.6^{(1)} < 3S_m = 69.9$	$70.1^{(1)} > 3S_m = 69.9$ $68.6^{(1)} < 3S_m = 69.9$	$0.668^{(2)} < 1.0$	$0.489^{(2)} < 1.0$

Notes:

1. The maximum range of stress intensity for the BMI tube is justified by using simplified elastic-plastic analysis methods per Subsection NB-3228.3 of the ASME B&PV Code. The maximum range excluding thermal bending was determined to be 68.6 ksi in the original stress report.
2. The cumulative usage factor for the SPU is less than the pre-SPU value because of corrections made to the pre-SPU usage calculation.

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Response to 12 a, b, c, and d for the Control Rod Drive Mechanism Table 2.2.2.4-1

Response to 12a and 12b – Control Rod Drive Mechanisms

Discuss the various ASME Class 1 components that have failed to meet the NB-3222.2 primary plus secondary stress intensity requirement of $3S_m$ but have been found acceptable as they have met alternate subparagraphs of Subsection NB.

The primary plus secondary stress intensities in Table 2.2.2.4-1 which exceed the $3S_m$ limit were not impacted by the uprate. Those values are justified in the analysis of record (AOR) in the following manner.

According to paragraph NB-3228.5, the $3S_m$ limit on the range of primary plus secondary stress intensity (NB-3222.2) may be exceeded provided that the requirements of (a) through (f) are met.

(a) The range of primary plus secondary membrane plus bending stress intensity, excluding thermal bending stresses, shall be $\leq 3S_m$. According to the AOR, the primary plus secondary membrane plus bending stress intensity is less than $3S_m$ with thermal bending removed.

(b) The value of S_a used for entering the design fatigue curve is multiplied by the K_e, as specified in NB-3228.5(b). The K_e factor was calculated and applied in the AOR.

(c) The rest of the fatigue evaluation stays the same as required in NB-3222.4, except that the procedure of NB-3227.6 need not be used. This requirement was followed in the fatigue analysis performed in the AOR.

(d) The component meets the thermal ratcheting requirement of NB-3222.5. The thermal ratcheting requirement was shown to be satisfied in the AOR.

(e) The temperature does not exceed those listed in Table NB-3228.5(b)-1 for the various classes of materials. Table NB-3228.5(b)-1 gives an allowable temperature of 800°F for austenitic stainless steel. The maximum primary coolant temperature during normal/upset condition transients is approximately 627°F, which is well within the limit of 800°F.

(f) The material shall have a specified minimum yield strength to specified minimum tensile strength ratio of less than 0.80. The pressure housing material has a maximum ratio of 0.43, which is less than the limiting ratio.

Based on the above discussions, it is concluded that all of the primary plus secondary stress intensity range criteria for upset conditions (including seismic stresses) are satisfied.

Response to 12c and 12d – Control Rod Drive Mechanisms

See response to Question 19 provided in Reference 4 (TXX-08031).

Response to 12 a, b, c, and d for the Steam Generators and Supports Table 2.2.2.5-10 and Table 2.2.2.5-11

Response to 12a – Steam Generators and Supports

Two components exceeded the criteria where

$$| Pm + Pb + Q | > 3S_m .$$

and a plastic analysis was performed. Those components are the divider plate and the tube-to-tubesheet weld. Code requirements are

(a) In evaluating stresses for comparison with the remaining stress limits, the stresses are calculated on an elastic basis;

(b) In lieu of satisfying the specific requirements of NB-3221.2, NB-3222.2, NB-3222.5 and NB-3227.3 at a specific location, the structural action is calculated on a plastic basis and the design shall be considered to be acceptable, if shakedown occurs (as opposed to continuing deformation) and if the deformations which occur prior to shakedown do not exceed specified limits;

(c) In evaluating stresses for comparison with fatigue allowables, the numerically maximum principal total strain range which occurs after shakedown shall be multiplied by one-half of the Young's modulus of the material (Table I-6.0) at the mean value of the temperature of the cycle.

The following discussion is for those two components that were qualified using plastic analysis per NB-3228.1 of the Code.

Divider Plate:

The divider Plate is not part of the pressure boundary. Deformation of the tubesheet and channel head are the principal cause of the divider plate stresses. Therefore, those transients with a pressure in the primary chamber or a large primary-to-secondary pressure drop across the tubesheet produce the most severe deformations and the highest stresses.

Since the $3S_m$ limit was exceeded for some primary-plus-secondary stress intensity ranges, a plastic analysis was performed for all transients which were part of a stress range greater than $3S_m$. Test conditions involved in stress ranges greater than $3S_m$ were evaluated plastically.

Per paragraph NB-3228.1 of the Code, the $3S_m$ limit can be exceeded if a plastic analysis is performed and shakedown is demonstrated. Since the divider plate loading originates from imposed deformations derived from the tubesheet and channel head displacements, the amount by which it can deform is limited by these displacements. Therefore the shakedown does occur.

Since deformation is strictly limited by the extent that the tubesheet displaces, and this maximum displacement is within acceptable limits, criterion NB-3228.1(b) is met.

Fatigue analysis was done and the strains in the divider plate for the transients were considered. Strains were calculated and the fatigue calculations were done with strains as stipulated in NB-3228.1(c). All strains were calculated based on the plastic analysis.

Tube/ Tubesheet Weld:

Stresses from transient not exceeding the 3Sm limit were calculated on an elastic basis.

The tube is captured within the tubesheet. There are no significant temperature gradients occurring in the vicinity of the tube-to-tubesheet weld. Therefore, the requirements of Code paragraph NB-3222.5 (Thermal Stress Ratchet) are implicitly satisfied.

Stresses were calculated in accordance with the requirements of NB-3228.1(c). All strains were calculated based on the plastic analysis results.

Response to 12b – Steam Generators and Supports

The following components were analyzed using the simplified elastic-plastic analysis approach of NB-3228.3.

1) Tubes
2) Main Feedwater Nozzle,
3) Steam Nozzle,
4) Support Ring.

Per NB-3228.3(b), simplified elastic-plastic analysis criteria, the $3S_m$ limit on the range of primary-plus-secondary stress intensity (3222.2) may be exceeded provided that the requirements of (a) through (f) are met. The criteria is listed below along with how it is satisfied within the analysis performed.

NB-3228.3 (a) The range of primary-plus-secondary membrane plus bending stress intensity, excluding thermal bending stresses, shall be $\leq 3S_m$.

For the components that were evaluated using the simplified elastic-plastic methodology, the primary-plus-secondary membrane plus bending stress intensity excluding thermal bending compared to the allowable limit ($3S_m$) meet that criteria and is less than the allowable stress intensity of $3S_m$. This requirement is therefore met for the components listed as not initially meeting the $3S_m$ limit with thermal bending considered.

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NB-3228.3 (b) The value of S_a used for entering the design fatigue curve is multiplied by the factor K_e, ...

The K_e factor as defined for this requirement is calculated for all stress ranges that exceed the $3S_m$ limit. S_a is multiplied by the K_e factor and this product is used to enter the design fatigue curve. This is done for all components where a simplified-elastic plastic analysis is performed.

NB-3228.3 (c) The rest of the fatigue evaluation stays the same as required in NB-3222.4, except that the procedure of NB-3227.6 need not be used.

The fatigue analysis for all components is performed per the Code. Where $3S_m$ is exceeded, the alternating stress (S_a) used to enter the fatigue curve is multiplied by K_e and the fatigue usage for that combination is calculated. Otherwise there is no change to the Code methodology used to calculate the fatigue usage factor for the components.

NB-3228.3 (d) The component meets the thermal ratcheting requirement of NB-3222.5.

The components listed as applying the simplified elastic-plastic analysis methodology meet this condition either because the component is not subject to internal steady state pressure loading or because the stress has been shown to meet the Code requirements for thermal stress ratchet.

NB-3228.3 (e) The temperature does not exceed those listed I the above table for the various classes of Code materials.

Since the maximum temperatures specified in the table of "m" and "n" parameters for various classes of Code materials, Item (b) above, is 700 and 800 degrees F, and none of the steam generator components exceed 700 degrees F, this requirement is met for all steam generator components.

NB-3228.3 (f) The material shall have a minimum specified yield strength to minimum specified ultimate strength ratio of less than 0.80.

Steam generator materials used within the Comanche Peak unit 2 steam generators have a minimum specified yield strength to minimum specified ultimate strength ratio less than 0.70 for the range of materials and temperatures. This is less than the maximum of 0.80 required by the Code. Therefore, this requirement is met for all of the components considered.

Response to 12c and 12d – Steam Generators and Supports

The following tables (12c, 12d, 2.2.2.5-10 and 2.2.2.5-11) are provided in response to Request for Additional Information 12c and 12d. Please note in Table 2.2.2.5-10 there are no values available for Note (1) for divider plate and tube-to-tubesheet weld. See response to 12a for further explanation.

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Table 12c
Comanche Peak Unit 1 Design / Uprate Evaluation Summary Primary-Side Components

Component	Load Condition	Stress Category	Location	Stress (ksi) / Fatigue	Allowable (ksi) / Fatigue	Ratio = Stress ÷ Allowable	Notes (1)
Divider Plate	Normal, Upset, Test	$P_m + P_b + Q$	Fillet	---	---	---	(2)
		Fatigue	Fillet	[ ] a,c	1.00	[ ] a,c	
		Fatigue	Drain Hole	---	---	---	(3)
Tubesheet	Normal, Upset, Test	$P_m + P_b + Q$	Tubesheet Center-Secondary Surface	[ ] a,c	115.00	[ ] a,c	(4)
		Fatigue	Tubesheet -Secondary Surface	[ ] a,c	1.00	[ ] a,c	
	Normal, Upset, Test	$P_m + P_b + Q$	Upper Shell junction, Inside Surface	[ ] a,c	115.00	[ ] a,c	(4)
		Fatigue	Upper Shell junction, Inside Surface	[ ] a,c	1.00	[ ] a,c	
	Normal, Upset, Test	$P_m + P_b + Q$	Lower Shell junction, Inside Surface	[ ] a,c	115.00	[ ] a,c	(4)
		Fatigue	Lower Shell junction, Inside Surface	[ ] a,c	1.00	[ ] a,c	
Tube to Tubesheet Weld	Normal, Upset, Test	$P_m + P_b + Q$	Weld Root	---	---	---	(2)
		Fatigue	Weld Root	[ ] a,c	1.00	[ ] a,c	
Tubes	Normal, Upset, Test	$P_m + P_b + Q$	Section A-A, Tubesheet Secondary Surface	[ ] a,c	79.90	[ ] a,c	
		Fatigue	Section A-A, Tubesheet Secondary Surface	[ ] a,c	1.00	[ ] a,c	
Blowdown Pipe	Normal, Upset, Test	$P_m + P_b + Q$	----	---	---	---	(5)
		Fatigue	---	---	---	---	(5)

Notes (Table 12a):

(1) The stress analyses of the Replacement Steam Generator components showed that the stresses and fatigue usages calculated for the baseline analysis are also applicable for the Uprate Condition. Therefore, effect of Uprate is insignificant.
(2) Exceeded 3Sm limit for primary-to-secondary stress intensity range. Per NB-3228.1 of the ASME Code, Section III, the 3Sm limit can be exceeded if plastic analysis is performed and shakedown is established. Fatigue analysis is performed based on plastic analysis.
(3) Not Applicable. This divider plate does not have a drain hole.
(4) Based on Test Allowable - 2Sy.
(5) Replacement Steam Generator Design does not have a blowdown pipe. There is a blowdown passageway in the tubesheet.

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Table 12d
Comanche Peak Unit 1 Design / Uprate Evaluation Summary Secondary-Side Components

Component	Load Condition	Stress Category	Location	Stress (ksi) / Fatigue	Allowable (ksi) / Fatigue	Ratio = Stress ÷ Allowable	Notes (1)
Main Feedwater Nozzle	Normal, Upset, Test	$P_m + P_b + Q$	ASN 6, Inside Surface	[ ] a,c	90.00	[ ] a,c	
		Fatigue	ASN 14, Inside Surface	[ ] a,c	1.00	[ ] a,c	
Auxiliary Feedwater Nozzle	Normal, Upset, Test	$P_m + P_b + Q$	ASN 11 Inside Surface	[ ] a,c	90.00	[ ] a,c	
		Fatigue	ASN 10 Inside Surface	[ ] a,c	1.00	[ ] a,c	
Feedring and Spray Nozzles	Normal, Upset, Test	$P_m + P_b + Q$	Feedring ASN 6	[ ] a,c	47.10	[ ] a,c	(2)
		Fatigue	Feedring ASN 7	[ ] a,c	1.00	[ ] a,c	
	Normal, Upset, Test	$P_m + P_b + Q$	Spray Nozzle ASN 3	[ ] a,c	69.90	[ ] a,c	
		Fatigue	Spray Nozzle ASN 2	[ ] a,c	1.00	[ ] a,c	
	Normal, Upset, Test	Pm + Pb + Q	Feedring to Spray Nozzle Weld ASN 4	[ ] a,c	78.00	[ ] a,c	
		Fatigue	Feedring to Spray Nozzle Weld ASN 4	[ ] a,c	1.00	[ ] a,c	
Secondary Manway Studs	Normal, Upset, Test	$P_m + P_b + Q$	Stud ASN 7	[ ] a,c	76.68	[ ] a,c	
		Fatigue	Stud ASN 7	[ ] a,c	1.00	[ ] a,c	
Steam Nozzle	Normal, Upset, Test	$P_m + P_b + Q$	ASN 3	[ ] a,c	90.00	[ ] a,c	
		Fatigue	ASN3	[ ] a,c	1.00	[ ] a,c	
	Normal, Upset, Test	Fatigue	Fillet Weld - Horizontal Section	[ ] a,c	1.00	[ ] a,c	
		Fatigue	Fillet Weld - Diagonal Section	[ ] a,c	1.00	[ ] a,c	
		Fatigue	Fillet Weld - Vertical Section	[ ] a,c	1.00	[ ] a,c	

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Component	Load Condition	Stress Category	Location	Stress (ksi) / Fatigue	Allowable (ksi) / Fatigue	Ratio = Stress ÷ Allowable	Notes (1)
Support Ring	Normal, Upset, Test	$P_m + P_b + Q$	ASN 9	[ ] a,c	57.66	[ ] a,c	(2)
		Fatigue	ASN 9	[ ] a,c	1.00	[ ] a,c	
Wrapper Support System	Normal, Upset, Test	$P_m + P_b + Q$	Lwrapper Support Lug to Shell Weld	[ ] a,c	56.10	[ ] a,c	
		Fatigue	Lwrapper Support Lug to Shell Weld	[ ] a,c	1.00	[ ] a,c	

Note (Table 1b):

(1) The stress analyses of the Replacement Steam Generator components showed that the stresses and fatigue usages calculated for the baseline analysis are also applicable for the Uprate Condition. Therefore, effect of Uprate is insignificant.

(2) Exceeded 3Sm limit for primary-to-secondary stress intensity range. Therefore, simplified elastic-plastic analysis was performed per NB-3228.5 of the ASME Code, per NB-3228.5 of the ASME Code, Section III. Fatigue analysis is performed based on elastic-plastic analysis.

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Table 2.2.2.5-10
Comanche Peak Unit 2 Uprate Evaluation Summary Primary Side Components

Component	Load Condition	Stress Category	Stress (ksi) / Fatigue		Allowable (ksi) / Fatigue	Comments
			Baseline	Uprate[4]		
Divider Plate	Normal/Upset	$\mid P_m+P_b+Q \mid$ - (Section 1, OS)	(1)	(1)	69.9	
	Fatigue	Fillet	[ ] a,c	[ ] a,c	1.0	(6)
		Fillet	[ ] a,c	[ ] a,c	1.0	(5)
		Drain Hole	[ ] a,c	[ ] a,c	1.0	(6)
		Drain Hole	[ ] a,c	[ ] a,c	1.0	(5)
Tubesheet	Normal/Upset	$\mid P_m+P_b+Q \mid$ - (TS $_{\text{Center-Upper Surface}}$) [2]	[ ] a,c	[ ] a,c	122.0	Test Allowable ($2S_y$)
	Fatigue	Tubesheet - Center-Upper Surface	[ ] a,c	[ ] a,c	1.0	(6)
		Tubesheet - Center-Upper Surface	[ ] a,c	[ ] a,c	1.0	(5)
	Normal/Upset	$\mid P_m+P_b+Q \mid$ - Upper Shell Junction - IS	[ ] a,c	[ ] a,c	122.0	
	Fatigue	Upper Shell Junction -- IS	[ ] a,c	[ ] a,c	1.0	(6)
		Upper Shell Junction -- IS	[ ] a,c	[ ] a,c	1.0	(5)
	Normal/Upset	$\mid P_m+P_b+Q \mid$ - Lower Shell Junction – "A" – IS	[ ] a,c	[ ] a,c	90.0	
	Fatigue	Lower Shell Junction – "A" – IS	[ ] a,c	[ ] a,c	1.0	(6)
		Lower Shell Junction – "A" – IS	[ ] a,c	[ ] a,c	1.0	(5)

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Table 2.2.2.5-10 (cont.)
Comanche Peak Unit 2 Uprate Evaluation Summary Primary Side Components

Component	Load Condition	Stress Category	Stress (ksi) / Fatigue		Allowable (ksi) / Fatigue	Comments
Tube-to-Tubesheet Weld	Normal/Upset	$\mid P_m+P_b+Q \mid$ - Weld Root)[3]	(1)	(1)	77.80	
	Fatigue	Weld Root – Section 1	[ ] a,c	[ ] a,c	1.00	(6)
		Weld Root – Section 1	[ ] a,c	[ ] a,c	1.00	(5)
Tubes	Normal/Upset	$\mid P_m+P_b+Q \mid$ - Section B-B [3]	[ ] a,c	[ ] a,c	79.8	(3)
	Fatigue	Section B-B	[ ] a,c	[ ] a,c	1.0	(6)
		Section B-B	[ ] a,c	[ ] a,c	1.0	(5)
Blowdown Pipe	Normal/Upset	Pm + Pb + Q - Weld Location - C	[ ] a,c	[ ] a,c	90.00	
	Fatigue	Radial Direction	[ ] a,c	[ ] a,c	1.00	(6)
		Radial Direction	[ ] a,c	[ ] a,c	1.00	(5)
		Hoop Direction	[ ] a,c	[ ] a,c	1.00	(6)
		Hoop Direction	[ ] a,c	[ ] a,c	1.00	(5)

Notes:

1 Exceeded $3S_m$ limit for primary-to-secondary stress intensity range. Per NB-3228.1 of the Code Reference, the $3S_m$ limit can be exceeded if a plastic analysis is performed and shakedown is established. Fatigue analysis is performed based on the plastic and elastic analysis results.
2 Based on Test Allowable $2S_y$.
3 Exceeds $3S_m$. Simplified elastic-plastic analysis was done and K_e factors were used in the fatigue calculation.
4 The uprate evaluation includes the effect due to the Low Temperature Overpressure Protection (LTOP) System.. The baseline analysis does not include COMS effect.
5 w LTOP.
6 w/o LTOP.

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Table 2.2.2.5-11
Comanche Peak Unit 2 Uprate Evaluation Summary Secondary Side Components

Component	Load Condition	Stress Category	Stress (ksi) / Fatigue		Allowable (ksi)/ Fatigue	Comments
			Baseline	Uprate		
Main Feedwater Nozzle	Normal / Upset	$\| P_m + P_b + Q \|$ - Section G-G - OS	[ ] a,c	[ ] a,c	51.90	(1)
	Fatigue	Section G-G - OS	[ ] a,c	[ ] a,c	1.0	FW Temp. = 390 °F
		Section D-D - IS:	≤ [ ] a,c	[ ] a,c	1.0	FW Temp. = 390 °F
Auxiliary Feedwater Nozzle	Normal / Upset	Section A-A – IS	[ ] a,c	[ ] a,c	90.0	(Sections D-D, F-F, G-G, and H-H) (1)
	Fatigue	Section A-A – IS	[ ] a,c	[ ] a,c	1.0	
Secondary Manway Bolts	Normal / Upset	$\| P_m + P_b + Q \|$ - Bolt IS	[ ] a,c	[ ] a,c	85.5	
	Fatigue	Bolt	[ ] a,c (2)	[ ] a,c (3)	1.0	
Secondary Manway Studs/Nuts	Normal / Upset (4)	$\| P_m + P_b + Q \|$	[ ] a,c	[ ] a,c	86.9	
	Fatigue	Stud	[ ] a,c	[ ] a,c	1.0	
Steam Nozzle	Normal Upset	$\| P_m + P_b + Q \|$ - Section A-A	[ ] a,c	[ ] a,c	90.0	
	Fatigue	Section A-A – IS	[ ] a,c	[ ] a,c	1.0	
	Normal / Upset	$\| P_m + P_b + Q \|$ - Insert Fillet Weld (horizontal section)	[ ] a,c	[ ] a,c	78.0	(1)
	Fatigue	Fillet Weld – Horizontal Section	[ ] a,c	[ ] a,c	1.0	Adjusted for pre-uprate operation
		Fillet Weld – Diagonal Section	[ ] a,c	[ ] a,c	1.0	
		Fillet Weld – Vertical Section	[ ] a,c	[ ] a,c	1.0	

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Table 2.2.2.5-11 (cont.)
Comanche Peak Unit 2 Uprate Evaluation Summary Secondary Side Components

Component	Load Condition	Stress Category	Stress (ksi) / Fatigue		Allowable (ksi)/ Fatigue	Comments
			Baseline	Uprate		
Support Ring	Normal / Upset	$\| P_m + P_b + Q \|$ - Support Ring	[ ] a,c	[ ] a,c	56.10	(1)
	Fatigue	Support ring - IS	[ ] a,c	[ ] a,c	1.0	
Wrapper Support System	Normal/ Upset	$\| P_m + P_b + Q \|$	n/a	n/a		No impact from uprate
	Fatigue	All Support Components	< [ ] a,c	< [ ] a,c	1.0	No impact from uprate

Notes:

1. Simplified elastic-plastic analysis was performed to show qualification per the requirements of NB-3228.3 of the Code.
2. Fatigue usage shown is for a 20-year replacement schedule.
3. Fatigue usage shown is for an 18-year replacement schedule.
4. Enveloping stress, after uprate, is due to the Secondary Hydro Test transient which is unaffected by the uprate and remains enveloping.

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Response to 12 a, b, c, and d for the Pressurizer and Supports Table 2.2.2.7-2

Response to 12a and 12b – Pressurizer

The following six criteria were considered in evaluating the components listed as not meeting the $3S_m$ stress limit. Each of the criteria is listed followed by a brief discussion about why the criterion was met for those components in question. Fatigue analysis for all of the affected components proceeded according to the Code with the exception that the affected stress ranges were multiplied by the K_e factor calculated per NB-3228.3 (b).

While the stress intensity range failed to meet 3Sm initially, it was shown to meet the $3S_m$ limit once the thermal bending stress was removed and is therefore acceptable.

In all cases, the requirements (a) through (f), which require a simplified elastic-plastic analysis, were met as discussed below.

NB-3228.3 (a) The range of primary-plus-secondary membrane plus bending stress intensity, excluding thermal bending stresses, shall be $\leq 3S_m$.

For the components that were evaluated using the simplified elastic-plastic methodology, the primary-plus-secondary membrane plus bending stress intensity excluding thermal bending compared to the allowable limit ($3S_m$) are shown to be less than 1.0. This requirement is therefore met for the components listed as not initially meeting the $3S_m$ limit with thermal bending considered.

NB-3228.3 (b) The value of S_a used for entering the design fatigue curve is multiplied by the factor K_e, ...

The K_e factor as defined for this requirement is calculated for all stress ranges that exceed the $3S_m$ limit. S_a is multiplied by the K_e factor and this product is used to enter the design fatigue curve. This is done for all components where a simplified-elastic plastic analysis is performed.

NB-3228.3 (c) The rest of the fatigue evaluation stays the same as required in NB-3222.4, except that the procedure of NB-3227.6 need not be used.

The fatigue analysis for all components is performed per the Code. Where $3S_m$ is exceeded, the alternating stress (S_a) used to enter the fatigue curve is multiplied by K_e and the fatigue usage for that combination is calculated. Otherwise there was no change to the methodology used to calculate the fatigue usage factor for the components.

NB-3228.3 (d) The component meets the thermal ratcheting requirement of NB-3222.5. The components listed as applying the simplified elastic-plastic analysis methodology meet this condition because the stress has been shown to meet the Code requirements for thermal stress ratchet.

NB-3228.3 (e) The temperature does not exceed those listed in the above table for the various classes of Code materials.

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Since the maximum temperatures specified in the table of "m" and "n" parameters for various classes of Code materials, Item (b) above, is 700 and 800 degrees F, and none of the pressurizer components exceed 700 degrees F, this requirement is met for all pressurizer components.

NB-3228.3 (f) The material shall have a minimum specified yield strength to minimum specified ultimate strength ratio of less than 0.80.

Pressurizer materials used within the Comanche Peak pressurizers have a minimum specified yield strength to minimum specified ultimate strength ratio less than 0.70 for the range of materials and temperatures. This is less than the maximum of 0.80 required by the Code. Therefore, this requirement is met for all of the components considered.

Response to 12c – Pressurizer

Since values are present in Table 2.2.2.7-2 for the pressurizer, this does not apply.

Response to 12d – Pressurizer

There was no change between the stresses produced by SPU and current licensing conditions for the pressurizer. Therefore, adding an extra column with identical numbers to Tables 2.2.2.7-2 and 2.2.2.7-3 is not necessary.

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Response to 12 a, b, c, and d for the Reactor Pressure Vessel Internals and Core Supports Table 2.2.3-6

Response to 12a and 12b – Reactor Pressure Vessel Internals and Core Supports

Table 2.2.3-6 states that for the case of the Core Barrel Outlet Nozzle Section A-A, which exceeded the code allowable limit of 3Sm, the "simplified elastic-plastic analysis was performed to calculate fatigue strength, as allowed by ASME, B&PV Code, Section III, NG 3228.3. These conditions have been met and the fatigue usage is less than 1.0."

Summary of the evaluation which shows that the special rules for exceeding 3Sm as provide by (a) through (f) of Subparagraph 3228.3 have been met is as shown below:

According to Section NG-3228.3, the $3S_m$ limit may be exceeded, provided that the following requirements listed in that section are met.

(a) The range of primary plus secondary membrane plus bending stress intensity, excluding thermal bending stresses, shall be less than $3S_m$.

The stress intensity is 24,426 psi < $3S_m$ = 34,440 psi

(b) The value of S_a used for entering the design fatigue curve is multiplied by the factor, K_c, where:

$$K_c = 1.0 \text{ for } S_n \leq 3S_m$$

$$K_c = 1.0 + \frac{1-n}{n(m-1)}\left(\frac{S_n}{3S_m} - 1\right) \text{ for } 3S_m < S_n \leq 3mS_m$$

$$K_c = \frac{1}{n} \text{ for } S_n \geq 3mS_m$$

where: n = 0.3 and m = 1.7 for stainless steel.

Since the stress intensity (S_n) was determined as 51,803 psi, the value of K_c to be used in the fatigue analysis is:

$$K_c = 1.0 + 3.333\left(\frac{51{,}803}{34{,}440} \quad 1\right) = 2.68$$

(c - f) The cumulative fatigue usage will be determined here using the K_c value where necessary, and must have a value below 1.0. The nozzle meets thermal ratcheting requirements. The maximum temperature will remain below 800°F.

Also, 304 stainless steel has adequate yield strength to ultimate strength ratio.

Cumulative Usage Factor

$$U = U_1 + U_2 + U_3 + U_4 + U_5 + U_6 + U_7$$

$$U = 0.385 + 0.032 + 0.0006 + 0.0004 + 0.013 + 0.05 + 0.002 = 0.483$$

Response to 12c and 12d – Reactor Pressure Vessel Internals and Core Supports

See the response to Question 13 for appropriately revised tables

NRC Question 13:

For RPV internals, the FIV analyses results are shown in Tables 2.2.3-4 and 2.2.3-5 of the SPULR. Table 2.2.3-6 shows a summary of component stresses and fatigue usage factors.

a) Verify whether the reported values in Tables 2.2.3-4, 2.2.3-5 and 2.2.3-6 are for both CPSES units and confirm that the reported values are for SPU conditions. Also, provide corresponding values at current conditions.

b) Table 2.2.3-5 provides a material endurance limit for the guide tubes of 101.5 x10^{-6} in/in strain. This material endurance limit appears to be very low. Provide the material for the guide tubes and the source that shows this material endurance limit or the source that is used to derive it.

Response 13)

The values reported in Tables 2.2.3-4, 2.2.3-5 and 2.2.3-6 are for both the Comanche Peak Units 1 and 2 for the stretch power uprate program conditions. The titles of these Tables are revised to include this explanation.

The current analysis of record values column was added to these tables as requested. The revised Tables are as given below:

Table 2.2.3-4
Comanche Peak Units 1 and 2 – SPU Program Conditions
Lower Internal Critical Component Stresses Due to FIV

Component	Current Maximum Alternating Stress psi	Maximum Alternating Stress psi	ASME Code Endurance Limit(1) (high-cycle fatigue) psi
Core Barrel Flange	[ ] a,c	[ ] a,c	23,700
Core Barrel Girth Weld	[ ] a,c	[ ] a,c	23,700

Note:
1. Basis is ASME Code section NB-3222 and Figure I-9.2.2, Curve A and Table I-9.2.2.

Table 2.2.3-5 Comanche Peak Units 1 and 2 – SPU Program Conditions Upper Internals Critical Component Strains Due to FIV			
Component	**Current Mean Strain in/in x 10^{-6}**	**Uprated Mean Strain in/in x 10^{-6}**	**Endurance Limit Strain in/in x 10^{-6}**
Guide Tubes	17.29	[ ] a,c	101.5

The measured strains during the hot functional test are for the 150-inch 17x17 guide tube (304 Stainless Steel) design, which can conservatively be used for the Comanche Peak Units 1 and 2 96-inch 17x17 guide tube. The reason for this conservatism is that the longer guide tube would deflect more than the shorter guide tube resulting in larger strains and stresses. Guide tube endurance limit strain of 101.5 (in/inx10^{-6}) was established at point of failure with prototype guide tube in a laboratory fatigue test.

It is important to note that the core (fuel assemblies) is not present during the hot functional testing. Guide tube test results show that the strain measurements of the guide tubes without the core during hot functional testing are more than the measurements with the core present.

Table 2.2.3-6
Comanche Peak Units 1 and 2 – SPU Program Conditions
Reactor Internal Components Stresses and Fatigue Usage Factors

Component	**Current Stress Intensity (ksi) S.I. = (P_m + P_b + Q)**	**SPU Stress Intensity (ksi) S.I. = (Pm + Pb + Q)**	**Allowable S.I. (3 S_m) ksi**	**Fatigue Usage**
Upper Core Plate	[ ](3) a,c	[ ]a,c	48.6	[ ] a,c
Lower Support Plate	[ ] a,c	[ ]a,c	48.3	[ ] a,c
Lower Core Plate	[ ](3) a,c	[ ]a,c	48.6	[ ] a,c
Lower Support Columns	[ ] a,c	[ ]a,c	48.3	[ ] a,c
Core Barrel Outlet Nozzle: Section A-A Section B-B	 [ ](1) a,c [ ]a,c	 [ ](1) a,c [ ] a,c	 34.4 49.2	 [ ] a,c [ ] a,c
Baffle-Former Bolts(2)	--	--	--	--

Notes:

1) Exceeded 3 Sm limit, simplified elastic-plastic analysis was performed to calculate fatigue strength, as allowed by ASME, B&PV Code, Section III, NG 3228.3. These conditions have been met and the fatigue usage is less than 1.0.

2) The basis of the baffle-former bolt qualification is a fatigue test. The evaluation of the revised loads consisted of demonstrating that the loads associated with SPU are acceptable for the plant design life. Therefore, it is concluded that the baffle-former bolts are structurally adequate for the SPU RCS conditions.

3) The current upper and lower core plate stress intensities are based on two-dimensional analysis. The upper and lower core plate analysis for the Comanche Peak Units 1 and 2 SPU project are based on three-dimensional finite element models with update heating rates that supersede those used in the current upper and lower core plate analyses.

The Comanche Peak Units 1 and 2 reactor internal components were designed and built prior to the implementation of Subsection NG of the ASME Code Section III; therefore, no plant-specific ASME Code stress report was written for the reactor internals components. The Comanche Peak Units 1 and 2 reactor internal components were analyzed to meet the intent of the ASME Code, Section III 1971 Edition with Addenda through Summer 1973 criteria. But based on the previous evaluations and current practices, the guidelines in Subsection NG of the ASME Code were used for this evaluation.

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NRC Question 14:

Tables 2.2.2.5-5, 2.2.2.5-6 and 2.2.2.5-7 of the SPULR contain summaries of the FIV analyses results for the CPSES, Unit 1 SG tubes.

a) Provide similar summaries for CPSES, Unit 2.

b) Include FIV analyses summaries for the steam dryer, dryer supports and flow-reflector with respect to the fluid-elastic instability, acoustic loads and vortex shedding due to the SPU higher steam flow for both CPSES units. If FIV analysis for the dryer, supports and flow reflector has not been performed or FIV is not thought to be a concern for these components, provide an acceptable justification.

Response 14a for Unit 2 SG Tubes

The FIV analysis for the Comanche Peak Unit 2 Model D-5 steam generators was completed in 1981 and does not contain the same degree of detail as the Unit 1 replacement steam generators, completed in 2007. The Unit 2 Model D-5 analysis looked at the outermost tube because it contained relatively large unsupported spans, and the largest preheater and downcomer cross flow velocities are present at the outside of the tube bundle.

The process used for the uprate modifies the original (baseline) FIV results using a ratio of a function of density and velocity for the uprate versus the baseline case calculated for each of the PCWG Cases. The maximum ratio for any of the Cases is then conservatively used to arrive at the final results. If a ratio is found to be less than 1.0, no change from the baseline condition is made.

The following is a comparison of the results calculated for the Unit 2 uprate.

Parameter	Baseline	Uprate
Maximum stability ratio	[ ] a,c	[ ] a,c
Tube displacement	[ ] a,c mil RMS	---
	[ ] a,c mils Peak	[ ] a,c mils Peak
FIV tube stress	< [ ] a,c psi	< [ ] a,c psi
FIV tube wear (40 yrs)	< [ ] a,c mils	< [ ] a,c mils

Actual wear at AVBs was also reviewed based on CMOA reported results for the previous two outages. Again using the ratios derived based on thermal-hydraulic parameter changes, it was determined that based on the 95% confidence growth reported, the increase in wear is on the order of 6% through-wall and is acceptable post uprate.

Response 14b for Unit 2 SG Tubes

Flow loadings, including those associated with fluid-elastic instability, vortex shedding or acoustic type loadings are considered to be not significant in the analysis of the steam generator (SG) dryer and dryer supports and other steam generator internals. There are no existing conditions in the piping systems connected to RCS loop and components e.g. Main Steam Lines, as potential source for flow induced acoustic resonances or system vibration to adversely impact any of the RCS components such as steam generator internals. For example, there are no long cantilever branch lines or branch lines with heavy unsupported valves. Further there is no history of vibration problems in these lines at CPNPP, nor at other 4 loop Westinghouse-designed reactors. In-service experience has revealed no such phenomenon related to PWR and with the SPU increased flow conditions these effects will be monitored through existing plant loose monitoring procedures, in-service inspections and system walkdowns for plant vibration assessment as reasonably achievable following SPU, as provided in Response to RAI # 16 & 17.

The two Westinghouse SG models operating at CPNPP Units 1 and 2 do not use steam flow reflectors in the design. As a result, steam flow reflector FIV is not possible. Steam velocities and densities through the dryer region of the steam generator are relatively modest for CPNPP Units 1 and 2. These factors combined with a significant dryer clearance from the SG steam outlet nozzle indicate a low potential for flow induced vibration (FIV) concerns and cyclical acoustic type pressure loads for the dryers and supports for both units. Also, a history of SG operating experience with the same or similar type dryers and supports structures has shown FIV of this region not to be of concern.

Operating BWR plants have reported FIV related issues in the steam dryer region. However, flow characteristics through a BWR steam dome are significantly different from those of a typical PWR SG, such as those operating at CPNPP Units 1 and 2. Figure 1 illustrates a general steam dryer, steam dome and outlet nozzle flow path comparison between the two types of CPNPP SGs and a BWR plant. In a BWR plant, localized regions near the steam outlet nozzles may be continually exposed to steam flows in excess of 100 ft/s largely due to flow redirection. Steam flows of this nature may generate a concern for FIV related issues, with a potential for significant stresses in the steam dryers and support structures.

The steam velocities and densities through the dryer region of the CPNPP Units 1 and 2 steam generators show relatively low FIV potential, with a maximum of approximately 4.0 ft/s and 1.9 lbm/ft^3 respectively for the two CPNPP Units under the SPU dryer flow conditions. Also, clearances between the dryer top and SG steam exit nozzle are 30 inches or more with no other major components near the steam exit and a direct steam flow path existing to the SG steam outlet nozzle as indicated in Figure 14 b. These low steam velocities and densities combined with significant dryer clearances indicate a low potential for FIV concerns and cyclic acoustic type pressure loads for the dryers and support structure components in the CPNPP Units 1 and 2 steam generators.

Industry experience of PWR steam generators at roughly 28 domestic plants operating 92 steam generators with the same or similar types of dryer and support structures as those in service at CPNPP Units 1 and 2 have no reported operational failures or issues related to FIV. Many of these units have been visually inspected and found not to have any indication of FIV induced degradation of the steam dryers. This strong performance database of operating plant history is aligned with the Westinghouse expectation that FIV evaluation of the steam dryer region is not a concern within the operational bounds of the CPNPP Units 1 and 2 SPU.

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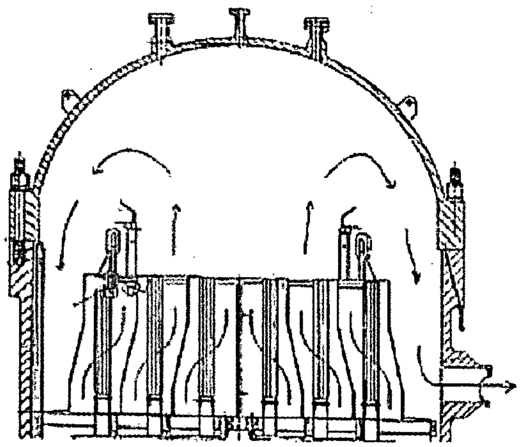
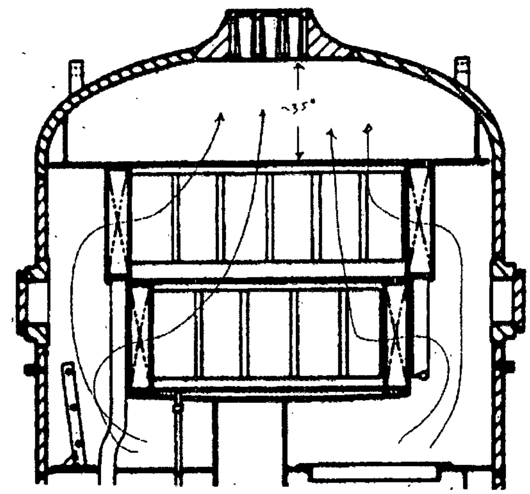
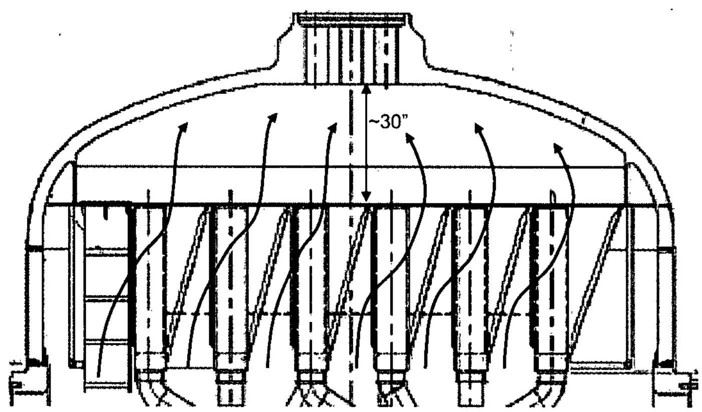


Typical BWR



CPNPP Unit 2 SG - Westinghouse Model D5



CPNPP Unit 1 SG - Westinghouse Model Delta-76

Figure 14 b -- CPNPP Unit 1 and 2 SG vs Typical BWR Generalized Steam Flow Comparison

ENCLOSURE TO TXX-08025

Westinghouse

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Proj letter ref WPT-17116 P-Attachment

Our ref: CAW-08-2388

February 20, 2008

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Subject: "Request for Additional Information Mechanical and Civil Engineering Branch (EMCB)" (Proprietary)

The proprietary information for which withholding is being requested in the above-referenced report is further identified in Affidavit CAW-08-2388 signed by the owner of the proprietary information, Westinghouse Electric Company LLC. The affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying affidavit by Luminant.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference this letter, CAW-08-2388 and should be addressed to J. A. Gresham, Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company LLC, P.O. Box 355, Pittsburgh, Pennsylvania 15230-0355.

Very truly yours,

J. A. Gresham, Manager
Regulatory Compliance and Plant Licensing

Jon Thompson (NRC O-7E1A)

Enclosures

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

ss

COUNTY OF ALLEGHENY:

Before me, the undersigned authority, personally appeared J. A. Gresham, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

J. A. Gresham, Manager
Regulatory Compliance and Plant Licensing

Sworn to and subscribed before me
this 20th day of February, 2008

Notary Public

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Sharon L. Markle, Notary Public
Monroeville Boro, Allegheny County
My Commission Expires Jan. 29, 2011
Member, Pennsylvania Association of Notaries

(1) I am Manager, Regulatory Compliance and Plant Licensing, in Nuclear Services, Westinghouse Electric Company LLC (Westinghouse), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Westinghouse "Application for Withholding" accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.

(ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitutes Westinghouse policy and provides the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

There are sound policy reasons behind the Westinghouse system which include the following:

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, it is to be received in confidence by the Commission.

(iv) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(v) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in "brackets" in "Request for Additional Information Mechanical and Civil Engineering Branch (EMCB)" (Proprietary), for submittal to the Commission, being transmitted by Luminant Power letter and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information is a response to the NRC Mechanical and Civil Engineering Branch Request for Additional Information dated January 30, 2008. The proprietary information as submitted for use by Westinghouse for Comanche Peak Nuclear Power Plant Units 1 and 2 is expected to be applicable for other licensee submittals in response to certain NRC requirements for justification of stretch power uprating.

This information is part of that which will enable Westinghouse to:

(a) Provide information in support of plant power uprate licensing submittals.

(b) Provide customer specific response to NRC requests for information.

(c) Provide licensing support for customer submittals.

Further this information has substantial commercial value as follows:

(a) Westinghouse plans to sell the use of similar information to its customers for purposes of meeting NRC requirements for licensing documentation associated with power uprate licensing submittals.

(b) Westinghouse can sell support and defense of the use of the technology to its customer in the licensing process.

(c) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar calculations and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

Proprietary Information Notice

Transmitted herewith are proprietary and/or non-proprietary versions of documents furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

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