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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
5. Letter logged TXX-08047 dated March 6, 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, 4, and 5.

On February 11, 2008, the NRC provided Luminant Power with additional RAIs from the following branches regarding the proposed changes to rated thermal power.

Reactor Systems Branch (follow-up questions)
Electrical Engineering Branch (follow-up questions)

The responses to these questions are provided in Attachment 1 to this letter. Attachment 2 includes a brief description of the modifications listed in Table 1.0-1 of WCAP 16840-P-A submitted in Reference 1.



A001
NRR

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 the following new commitment regarding Comanche Peak Units 1 and 2.

| <u>Number</u> | <u>Commitment</u> |
|---|---|
| 3495809 | The attached pressure and temperature profile will be incorporated into site design drawings and then used as the basis for revising the EQ packages. |

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 April 17, 2008.

Sincerely,

Luminant Generation Company LLC

Mike Blevins

By: Rafael Flores

Rafael Flores
Site Vice President

Attachments 1. Response to Additional Questions
2. Brief Descriptions of Planned SPU Modifications for CPNPP Units 1 and 2 (from Table 1.0-1)

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
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**Response to Additional Questions**

**Reactor Systems Branch**

**NRC Question 1:**
**Explain why the peak Reactor Coolant System (RCS) pressure in the turbine trip analysis (Stretch Power Uprate Licensing Report (SPULR) Table 2.8.5.2.1.2.4-1), in which the first trip is credited, is greater than the peak RCS pressure in the turbine trip overpressure analysis (TXX-08014, dated February 28, 2008), in which the first trip is not credited.**

**CPNPP Response:**
Based on discussions with the NRC during a teleconference on December 20, 2007, the turbine trip overpressure analysis (the SRP 5.2.2 second trip case) was performed using nominal input values for the initial NSSS power, initial pressurizer pressure, reactor coolant flow, and reactor trip setpoint, consistent with a design analysis rather than a safety analysis. Comparisons of the input differences between the second trip case and the first trip case (SPULR/FSAR safety analysis) are provided as follows.

| Input Parameter | Second Trip Case (for SRP 5.2.2) | First Trip Case (for FSAR) |
|---|---|---|
| Initial NSSS Power, % of nominal | **100.0** | **100.6** |
| Initial Pressurizer Pressure, psia | **2250** | **2220** |
| Reactor Vessel Coolant Flow, gpm(1) | 396,400 (MMF) | 382,800 (TDF) |
| Reactor Trip Credited | Overtemperature N-16 | High Pressurizer Pressure |

(1)MMF ° Minimum Measured Flow, TDF ° Thermal Design Flow.

**NRC Question 2:**
**Explain why the high pressurizer pressure trip signal in the turbine trip analysis (SPULR Table 2.8.5.2.1.2.4-1), is generated later than the high pressurizer pressure trip signal in the turbine trip overpressure analysis (TXX-08014, dated February 28, 2008).**

**CPNPP Response:**
The differences in the high pressurizer pressure reactor trip signal times are a result of the different initial conditions that were applied (see above response to RAI 1), particularly the initial pressurizer pressure.

**NRC Question 3:**
**Describe the analyses, and provide the results, that support the high nuclear flux setpoints for operation with inoperable Main Steam Safety Valves (MSSVs) (Table 2.8.4.2-3 of TXX-08014, dated February 28, 2008).**

**CPNPP Response:**
The method that was applied in determining the allowable power levels with inoperable main steam safety valves is described in Westinghouse Nuclear Safety Advisory Letter NSAL-94-001, "Operation at Reduced Power Levels with Inoperable MSSVs," dated January 20, 1994. NASL-94-001 was previously transmitted to the NRC in response to Question 7 of Reactor Systems Branch's Request for Additional Information. The application of the NSAL method involves hand calculations, and the results are presented in Table 2.8.4.2-3 of TXX-08014.

**NRC Question 4:**
**Explain the large difference between the proposed Stretch Power Uprate (SPU) setpoints and the current setpoints (Table 2.8.4.2-3 of TXX-08014, dated February 28, 2008).**

**CPNPP Response:**
The reason for the differences between the proposed SPU setpoints and the current setpoints presented in Table 2.8.4.2-3 of TXX-08014 is because different methods were applied. As noted above in the response to RAI 3, the proposed SPU setpoints were determined by applying the method described in NSAL-94-001, which is considered quite conservative.

**Electrical Engineering Branch (EEEB)**

**NRC Question 1:**
**In its RAI response dated February 21, 2008, the licensee stated (in response to NRC Question 1), "It is, and was our intent, to modify the temperature profiles utilized by the equipment qualification program to bound or reflect any changes that are the result of the SPU LOCA curve. A bounding temperature profile will be incorporated into design drawings and used as an input for EQ packages. The PAOT margin will be recalculated using this revised profile." The licensee's RAI response dated January 10, 2008, provided an SPU LOCA curve and EQ profile curve (Figure E1-1). The two curves appear to continue to overlap or crossover beyond the 24 hour point and diverge after approximately 1.00E+06 seconds. It is not clear which curve is used for supporting adequacy of the EQ life of equipment.**

**Please provide the following information: (1) Clarify the overlap points of the SPU LOCA curve and EQ profile curve to support bounding conditions, (2) Identify the process to be used to modify the temperature profiles utilized by the EQ program to bound (establish necessary margin) any changes that are the result of the SPU LOCA curve, (3) Identify the mission time of EQ components beyond 24 hours.**

**CPNPP Response:**
(1) In the RAI response dated February 21, 2008 it was stated that CPNPP EQ packages would be updated using bounding EQ profiles. In the previous response specific bounding profiles were not provided. In any of our past responses any LOCA profile identified as "proposed" should be disregarded. The following pressure and temperature profile will be incorporated into site design drawings and then used as the basis for revising the EQ packages. There are no overlap points when this profile is compared to the SPU LOCA curves.

EQ profiles

| Time (sec) | Temperature (F) |
|---|---|
| 1.00E-01 | 135.00 |
| 1.00E+00 | 178.00 |
| 1.00E+01 | 256.00 |
| 2.00E+01 | 280.00 |
| 3.00E+03 | 280.00 |
| 1.00E+05 | 171.00 |
| 1.00E+06 | 137.00 |
| 7.82E+06 | 122.00 |
| 1.00E+07 | 121.00 |

| Time (sec) | Pressure (psia) |
|---|---|
| 1.00E-01 | 16.60 |
| 1.00E+00 | 22.50 |
| 1.00E+01 | 49.60 |
| 2.00E+01 | 64.70 |
| 3.00E+03 | 64.70 |
| 1.00E+04 | 50.00 |
| 1.00E+05 | 28.80 |
| 1.00E+06 | 22.50 |
| 2.59E+06 | 21.50 |
| 1.00E+07 | 20.50 |

These pressure and temperature profiles will completely envelope the LOCA EQ envelope changes resulting from SPU.

(2) The bounding temperature profile will be incorporated into site-specific environmental drawings. These drawings will be used as the basis for changes to the temperature profiles utilized by EQ packages. Within each effected EQ package, the site-specific temperature profile will be compared to the qualified temperature profile documented within the test report(s) used to establish equipment qualification. Margin will be determined by a comparison of the site-specific requirements to the tested conditions.

(3) The post accident operating time (PAOT) utilized by CPNPP remains unchanged as a result of SPU. The PAOT is 100 days. As part of the package update process all PAOT margins will be recalculated, in packages affected by the temperature profile change.

**NRC Question 2:**
**In the letter dated January 10, 2008, the licensee stated (in response to NRC Question 3), "As described in LAR section 2.3.1.2.2, for the Unit 1 HELB small temperature increase, a component specific evaluation determined the equipment is qualified. However, the Unit 2 HELB temperature evaluation is ongoing and is expected to be completed by April 15, 2008."**

**Please provide the requisite analysis/evaluation to enable the NRC staff to complete its safety evaluation.**

**CPNPP Response:**
The Unit 2 HELB temperature evaluation has been completed. In the case of Unit 2, the results of the SPU calculation indicate that the HELB temperature in the Main Steam penetration areas reach a maximum of 334.4 F. A Main Steam penetration area profile, which bounds both Units 1 and 2, has been developed.

Typical HELB Temperature Profile for Superpipe Area

| Time (sec) | Temperature (F) |
|---|---|
| 1 | 325 |
| 110 | 340 |
| 155 | 340 |
| 160 | 275 |
| 180 | 275 |
| 215 | 305 |
| 285 | 340 |
| 315 | 340 |
| 350 | 212.45 |
| 700 | 212.45 |

The bounding profile will be incorporated into site-specific environmental drawings. These drawings will be used as input to revise the temperature profiles used by the EQ packages. Within each effected EQ package, the site-specific temperature profile will be compared to the qualified temperature profile documented within the test report(s) used to establish equipment qualification. Margin will be determined by a comparison of the site-specific requirements to the tested conditions.

**NRC Question 3:**
**In its RAI response dated February 21, 2008, the licensee stated (in response to NRC Question 3), "The changes that will be introduced by the replacement of the main transformers are small from the grid perspective."**

**The NRC staff considers that the changes in main transformer size and impedance can significantly impact the available short circuit current in the plant auxiliary system when the unit is on line and the auxiliaries are powered from the unit auxiliary transformers. Please confirm that studies have been completed to verify that available short circuit currents, for the minimum specified main transformer impedance, are within the rating of the plant auxiliary switchgear.**

**CPNPP Response:**
CPNPP specified a transformer impedance value that would not increase the available short-circuit currents for the plant auxiliary systems. This assures that the minimum transformer impedance is within the rating of the plant auxiliary switchgear.

The final studies on short-circuit of the non-safety buses impacted by the transformer change will be completed through station procedures that implement the CPNPP design modification process prior to the new transformer installation during 2RF11 for Unit 2 (October 2009) and 1RF14 for Unit 1 (March 2010) using actual transformer tested impedances.

**NRC Question 4:**
**In the license amendment request (LAR) Enclosure 1 (WCAP 16840-P), Section 2.2.2.6.2, the following analysis is provided for the RCP motors, "For hot loop conditions, a stator winding temperature rise of 68.2°C is compared to class B insulation. For cold loop conditions a stator winding temperature rise of 106°C is compared to class F insulation requirements."**

**Please provide the following information: (1) Confirm the insulation class of RCP motors and verify the adequacy of the insulation to withstand higher operating temperatures, (2) Confirm the requisite evaluations have been completed to verify the adequacy of cables and containment penetrations associated with the RCP motors operating at higher currents.**

**CPNPP Response:**
The Comanche Peak Reactor Coolant Pump Motor stators, both the originals and spares, were wound using a Class F insulation system. The stator windings are thermally rated at Class F but designed to operate at Class B temperature rises during hot loop operation. The stator was designed not to exceed Class F temperature rise limits during cold loop operation.

The evaluations of the AC Distribution System addresses the specific items reviewed associated with the Reactor Coolant Pump motor load changes. The appropriate calculations including cable sizing and electrical equipment sizing calculations were reviewed and verified adequate for higher RCP motor current. Some relay setting changes will be required as a result of motor load changes and will be completed through the CPNPP design modification process.

**NRC Question 5:**
**In the LAR, Enclosure 1 (WCAP 16840-P), Section 2.2.4.2.2, it is stated that, for the Auxiliary Feedwater System, the feedline break analysis requires a minimum flow of 430 gpm compared to the current requirement of 400 gpm. This is approximately 7.5% increase and considered within the rating of the pump and motor. The CPNPP FSAR Table 8.3-1 provides a nameplate rating of 700 HP for the Auxiliary Feedwater Pump and indicates that KW loading on the Emergency Diesel Generator (EDG) is based on *actual demand.***

**Provide the following information: (1) Confirm that the EDG loading calculations, fuel oil consumption and associated test procedures, if applicable, have been revised to accommodate the increase in EDG loading, (2) Generically, for most pumps and motors, it is stated in the LAR that there are no changes in pump flow rates even though the SPU will result in requiring higher decay heat removal capability during all postulated conditions. This implies that the pumps will be running for a longer duration to remove decay heat. Confirm that EDG fuel oil consumption calculation, if load dependant, has been revised for extended pump operation.**

**CPNPP Response:**
(1) As stated in LR Section 2.2.4.2.2, the increased flow is related to the turbine driven AFW pump, not the motor driven AFW pumps. The loading on the motor driven AFW pump motors are not affected by the SPU. Therefore, this does not impact EDG loading.

(2) The increase in decay heat associated with implementation of the power uprate has negligible effect on the required operating times for decay heat removal equipment in general and on AFW and RHR equipment in particular.

During plant cooldown scenarios, the AFW system is required to cooldown the RCS to RHR entry conditions (350°F) and the RHR system is required to continue the cooldown to cold shutdown conditions. The AFW system is designed to accomplish the cooldown to RHR entry conditions assuming an initial four hour hold at no-load conditions and a subsequent 50° F/hr cooldown rate. Hence, the design (required) operating time for AFW in a cooldown scenario is a total of approximately nine (9) hours. Calculations performed for SPU confirm the continued ability of the AFW system to fulfill this requirement. The required operating time at SPU conditions, while slightly longer than the pre-uprate case, is bounded by the overall design time. RHR entry conditions have not changed due to SPU and neither have RHR and support system operating characteristics (flow rates, temperature limits, etc.). The increased decay heat associated with SPU results in a slight increase in the time required to cooldown from 350°F to cold shutdown. However, the RHR system would continue to operate subsequent to reaching CSD conditions, both pre- and post-SPU, in accordance with Technical Specification requirements. Thus, the required operating time of the RHR (and support) system is not changed due to SPU.

EDG fuel oil storage requirements are based on seven (7) days of continuous operation at rated load and hence are not affected by SPU. The EDG fuel oil consumption calculation and thus the fuel storage requirements, are based on Regulatory Guide 1.137, Rev. 1 and ANSI-N195 (1976) and are independent of any specific design basis event scenario. EDG loading for these scenarios is below the full rated load capability of the EDG.

**NRC Question 6:**
**In the LAR, Enclosure 1 (WCAP 16840-P), Section 2.3.5.2.1, related to Loss of Ventilation during SBO, it is stated that the turbine-driven auxiliary feedwater pump area temperature is expected to reach 131.1°F during a Station Blackout event.**

**Confirm whether or not the feedwater pump has any electrical components local to the pump. If yes, confirm the components are qualified for the expected environment.**

**CPNPP Response:**
The turbine-driven auxiliary feedwater pumps are located in rooms 1-074 in Unit 1 and 2-074 in Unit 2. Both rooms 1-074 and 2-074 contain electrical equipment that is environmentally qualified. The areas contain the following types of components:

- Rosemont transmitters
- Fisher Electro Pneumatic Transducers
- NAMCO limit switches
- Limitorque motor actuators
- ITT Barton Pressure Switches

The environmental qualification packages document that the components are qualified for temperatures in excess of 131.1 F.

## ADDITIONAL QUESTIONS

**NRC Additional Question 1:**
**Name of manufacturer of the TDAFWP pump (typically Terry Turbine)?**

**CPNPP Response:**
Turbine is: Terry
Pump is: DRESSER RAND

**NRC Additional Question 2:**
**Does the TDAFWP have electronic speed sensor/control system local to the governor valve? If yes, can this control system function at the postulated temperatures {typically, qualified for operation at 104 degrees F or 120 degrees F for short term (few hours)}?**

**CPNPP Response:**
Beyond the mechanical/hydraulic governor there are no safety related components. The mechanical governor and governor valve are stand alone components driven by steam pressure.

There is a speed sensor on the turbine which sends speed indication to three locations - the control room, the remote shutdown panel, and local in the TDAFW room. The speed sensor has no controlling function, hence no safety related function and is therefore is not qualified for operation at 104 degrees F or 120 degrees F for short term.

Also, there is an manual/auto station on the main control board. It sends a 4/20 mA signal to an I/P in the TDAFW room. It is converted to an air signal which feeds into the mechanical governor. This control function is not used during accidents. The turbine runs at a constant speed during an accident and flow is controlled with the FCV going to the SG. During an SI the speed indication is no longer available and speed continues to be at the default speed.

**Brief Descriptions of Planned SPU Modifications for CPNPP Units 1 and 2 (from Table 1.0-1)**

1. **NSSS setpoints, settings, scaling**
The modifications include changes to setpoints and settings in the Rod Control System, Pressurizer Water Level Program, Steam Dump Control and Turbine Bypass Systems as a result of safety analyses performed at SPU conditions and are delineated in section 2.4.1.

2. **Pipe support modifications**
A total of nine pipe support modifications (all related to the feedwater system in Unit 1, two in the safeguards building and 7 in the turbine building) are required due to SPU conditions. The support modifications are minor in nature and involve the installation of one new pipe support (on a 3/4 inch drain line) and additional items such as increasing existing weld sizes, adding gussets, reinforcing existing support frame members, etc.. There are no piping modifications for U2.

   The changes are required to support operations at uprated power levels and are delineated in section 2.2.2.2

3. **HP Turbine Upgrade**
This modification entails the installation of a new HP Turbine and changes to flow parameters in the primary water system due to generator rerate and alarm settings.

   The changes are required to support operations at uprated power levels and are delineated in section 2.5.1.2.2

4. **Turbine Digital Controls and Voltage Regulator Setpoints**
This modification entails changes to the Turbine Digital Control System; changes to the Generator/TVR Digital Control System, installation of a new 50 MW load rejection button and the recalibration and re-spanning of the MSR steam supply flow transmitters 1-FT-6584 (1-RBO1P015) and 1-FT-6585 (1-RBO2P015).

   The changes are required to support operations at uprated power levels and are delineated in section 2.5.1.2.2

5. **Heater Drain Pump Rotating Element**
This modification entails the replacement of the Heater Drain Pump 3rd stage impellers to permit higher flows and the replacement of the 3rd point heater drain vent line AOVs w/ 8" pipe spool piece. The HI-HI level in the FWHTR 3A and 3B will be increased. The Heater Drain Pump Motors will also be replaced with 2000 HP motors.

   The changes are required to support operations at uprated power levels and are delineated in section 2.5.5.4

6. **Main Generator Hydrogen Coolers Replacement**
This modification entails the installation of new generator H2 coolers designed for 107F TPCW.

   The changes are required to support operations at uprated power levels and are delineated in section 2.3.3

7. **Iso-Phase Bus Duct Coolers Replacement**
   This modification entails the replacement of the existing Isophase Bus Duct Coolers with 40,000 cfm units along with inspection ports / test ports for fan sizing and flexible links.

   The changes are required to support operations at uprated power levels and are delineated in section 2.3.3

8. **Turbine Plant Cooling Water (TPCW) modifications for Main Generator Exciter Air Coolers**
   This modification entails the installation of new Exciter Air Cooler with larger capacity units and the removal of 4 flow orifices (1-FE-3067, 1FE-3068, 1-FE-3120. and 1-FE-3092) and installation of Annubars.

   The changes are required to support operations at uprated power levels and are delineated in section 2.3.3.

9. **BOP Setpoints, Settings, Scaling**
   The following modifications are required as a result of the evaluation of the impact of the new SPU process parameters on BOP instrumentation:
   A. Replacement of process indication scale plates and rebanding
   B. Recalibration and rescaling of transmitters
   C. Redesign of the FW suction pressure trip logic
   D. Changes to the pressure switch setpoints

   The changes are required to support operations at uprated power levels and are delineated in sections 2.3.3 and 2.4.1

10. **Main Step Up Transformers Replacement**
    This modification entails the replacement of the Unit 2 Main Transformers in the 2RF11 Fall 2009 Outage. Design to include interface, fire protection and sump changes.

    The change is an enhancement, not essential for uprate operation and is delineated in section 2.3.3.