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CP-201300139
TXX-13022

Ref. # 10CFR50.59
10CFR72.48

February 18, 2013

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

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT
DOCKET NOS. 50-445 AND 50-446 AND 72-74
10CFR50.59 EVALUATION SUMMARY REPORT 017,
10CFR72.48 EVALUATION SUMMARY REPORT 002, AND
COMMITMENT MATERIAL CHANGE EVALUATION REPORT 011

Dear Sir or Madam:

Please find attached the report required by 10CFR50.59(d)(2) for those activities which were completed or partially completed at Comanche Peak Units 1 and 2 between February 2, 2011, and August 1, 2012, and which were not reported to the Nuclear Regulatory Commission (NRC) in a previous submittal. This report contains a brief description of the changes, tests and experiments implemented or performed pursuant to 10CFR50.59(c), including a summary of the evaluations for each. Items in this report are referenced by their 10CFR50.59 Evaluation Numbers. This report also includes certain activities completed pursuant to 10CFR50.59 after August 1, 2012.

Luminant Generation Company LLC (Luminant Power) did not complete (or partially complete) any evaluations at Comanche Peak Units 1 and 2 required by 10CFR72.48 between February 2, 2011, and August 1, 2012, and which were not reported to the Nuclear Regulatory Commission (NRC) in a previous submittal. Therefore, no summaries of evaluations are required in this report per 10CFR72.48(d)(2) for Comanche Peak Units 1 and 2.

Luminant Power did not make commitment material changes which require reporting for Comanche Peak Units 1 and 2 per the recommendations of Nuclear Energy Institute (NEI) document, "Guideline for Managing NRC Commitments," Revision 2. Therefore, no descriptions are provided for Commitment Material Change Evaluation Report 011.

IE47
NMSS26

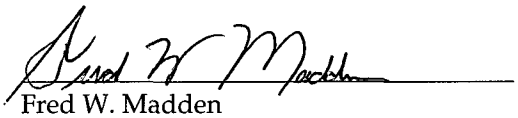
This communication contains no new commitments regarding Comanche Peak Units 1 and 2.

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

Sincerely,

Luminant Generation Company LLC

Rafael Flores

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

Attachment

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

10CFR50.59 Evaluations:

59EV-2001-001255-01-02 (Revised)

59EV-2001-001255-02-01 (Revised)

59EV-2009-000859-01-01

59EV-2010-000011-01-00

59EV-2010-000172-01-02

59EV-2012-000009-01-00

10CFR72.48 Evaluations:

None

CMCE Evaluations:

None

50.59 Evaluation No. - 59EV-2001-001255-01-02 **Unit 1**

Title:

This evaluation for the analog-to-digital upgrade of the replacement of the diesel generator voltage regulator/exciter was revised to incorporate a design modification to address revisions to steady-state voltage tolerance ranges.

Activity Description:

This evaluation originally covered the analog-to-digital upgrade of the replacement of the diesel generator voltage regulator/exciter provided by Siemens/Framatome. The new exciter/voltage regulator uses Siemens' proprietary THYRIPART equipment and software. The principal digital component is the Automatic Voltage Regulator (AVR), a Masterdrive digital control system which improves THYRIPART regulation by producing a digitally-controlled single-phase zero frequency (DC) output. This DC output boosts or bucks the field current as required to provide ±0.5 percent Diesel Generator voltage regulation.

Components of this digital control system are:

(1) Control Board, the brains of the AVR which contains the parameter set for control functions and fault diagnostics.

(2) Operator control panel displays, parameter numbers and values on a LED screen (able to scroll the screen and change parameters with a keypad).

(3) Technology Board which implements the software for open-loop and closed-loop control. (Functional logic can be changed by software, and parameters can be changed from the operator control panel or software.)

(4) Serial communications unit which consists of a Serial Communications Board in the AVR and two remote input/output units (provides interface for digital inputs and outputs from throughout the THYRIPART with the AVR.)

A second digital component is the Siprotec multifunctional relay. The function of this relay is nonsafety-related since the relay trip function is disconnected, by a non-digital safety-related device, when a diesel generator emergency start signal is received.

NOTES

This evaluation was revised to incorporate a design modification to address revisions to steady-state voltage tolerance ranges. The original voltage range was set too tight, resulting in unnecessary tripping of the digital AVR when the diesel generator was operating within design limits.

Summary of Evaluation:

The new upgraded THYRIPART DG field excitation unit serves the same function as the existing analog system. During normal operation, the AVR has two independent closed-loop control systems, the automatic channel which contains the automatic voltage control, the PF/VAR control and all limiters; and the manual channel which provides manual adjustment of field current directly from the control room if the automatic channel mode experiences trouble.

Only one closed-loop control system is in operation at any one time, usually the automatic channel.

The failures of the AVR to control the steady state voltage within specification, i.e., design basis requirements, are sensed by an external non-digital failure monitoring device. If Diesel Generator steady state voltage goes outside the desired limits or other significant faults occur which results in the Diesel Generator voltage exceeding the Technical Specification limits, a non-digital safety-related voltage monitoring device will disconnect the AVR before the voltage goes outside the relay tolerance range allowed by RG 1.9, Rev.3. This non-digital safety-related voltage monitoring device is external to the AVR and will disconnect the AVR via the K604 contactor before the voltage goes outside the tolerance range of 6415V to 7222V (Technical Specification limits of 6480V - 7150V plus relay tolerance of 0.5 percent) with a time delay consistent with RG 1.9, Rev. 3 requirements to allow for expected bus voltage transients due to motor starting.

The THYRIPART magnetics then maintains the Diesel Generator steady state voltage within the Technical Specification limits. In this condition, the Diesel Generator continues to meet Regulatory requirements and requirements of the Chapter 15 accident analysis.

The original voltage tolerance range for the K300 relay settings were the Technical Specification limits of 6480V - 7150V considering the relay tolerance of 0.5 percent, was too narrow, resulting in the AVR being unnecessarily tripped during certain conditions when the diesel generator was operating within design limits. A new upper voltage tolerance limit was developed in accordance with NUREG 1.152 R3, in which voltage limits are defined by safe 6.9 kV and 480 V bus operating limits, and Reg Guide 1.9 requirements.

Another digital component is a multifunction generator protective relay to provide diesel generator non-safety related protection, replacing existing electromechanical relays. This device is Class 1E because of its association with Class 1E wiring/power source. It remains connected to power at all times, but like the existing relays, its diesel generator trip functions are disconnected by an Emergency Start/Run signal, in accordance with FSAR Section 8.3.1.1.11.

The relay function, provided by software/firmware, is non-safety related.

Human-System Interface is through handswitches, meters and indicators, which are similar to existing components. There are no Video Display Unit screen displays. Both operator control panel and the multifunction generator protective relay have LED screens which display parameters and functions, and are scrolled by a keypad. No fundamental HSI changes result from this design.

There are no new accidents, failure modes, or malfunctions created by this change. Prior NRC approval is not required for this proposed plant activity.

50.59 Evaluation No. - 59EV-2001-001255-02-01 **Unit 2**

Title:

This evaluation for the analog-to-digital upgrade of the replacement of the diesel generator voltage regulator/exciter was revised to incorporate a design modification to address revisions to steady-state voltage tolerance ranges.

Activity Description:

This evaluation originally covered the analog-to-digital upgrade of the replacement of the diesel generator voltage regulator/exciter provided by Siemens/Framatome. The new exciter/voltage regulator uses Siemens' proprietary THYRIPART equipment and software. The principal digital component is the Automatic Voltage Regulator (AVR), a Masterdrive digital control system which improves THYRIPART regulation by producing a digitally-controlled single-phase zero frequency (DC) output. This DC output boosts or bucks the field current as required to provide ±0.5 percent Diesel Generator voltage regulation.

Components of this digital control system are:

(1) Control Board, the brains of the AVR which contains the parameter set for control functions and fault diagnostics.

(2) Operator control panel displays, parameter numbers and values on a LED screen (able to scroll the screen and change parameters with a keypad).

(3) Technology Board which implements the software for open-loop and closed-loop control. (Functional logic can be changed by software, and parameters can be changed from the operator control panel or software.)

(4) Serial communications unit which consists of a Serial Communications Board in the AVR and two remote input/output units (provides interface for digital inputs and outputs from throughout the THYRIPART with the AVR.)

A second digital component is the Siprotec multifunctional relay. The function of this relay is nonsafety-related since the relay trip function is disconnected, by a non-digital safety-related device, when a diesel generator emergency start signal is received.

This evaluation was revised to incorporate a design modification to address revisions to steady-state voltage tolerance ranges. The original voltage range was set too tight, resulting in unnecessary tripping of the digital AVR when the diesel generator was operating within design limits.

Summary of Evaluation:

The new upgraded THYRIPART DG field excitation unit serves the same function as the existing analog system. During normal operation, the AVR has two independent closed-loop control systems, the automatic channel which contains the automatic voltage control, the PF/VAR control and all limiters; and the manual channel which provides manual adjustment of field current directly from the control room if the automatic channel mode experiences trouble.

Only one closed-loop control system is in operation at any one time, usually the automatic channel.

The failures of the AVR to control the steady state voltage within specification, i.e., design basis requirements, are sensed by an external non-digital failure monitoring device. If Diesel Generator steady state voltage goes outside the desired limits or other significant faults occur which results in the Diesel Generator voltage exceeding the Technical Specification limits, a non-digital safety-related voltage monitoring device will disconnect the AVR before the voltage goes outside the relay tolerance range allowed by RG 1.9, Rev.3. This non-digital safety-related voltage monitoring device is external to the AVR and will disconnect the AVR via the K604 contactor before the voltage goes outside the tolerance range of 6415V to 7222V (Technical Specification limits of 6480V - 7150V plus relay tolerance of 0.5 percent) with a time delay consistent with RG 1.9, Rev. 3 requirements to allow for expected bus voltage transients due to motor starting.

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Another digital component is a multifunction generator protective relay which provides diesel generator non-safety related protection, replacing existing electromechanical relays. This device is Class 1E because of its association with Class 1E wiring/power source. It remains connected to power at all times, but like the existing relays, its diesel generator trip functions are disconnected by an Emergency Start/Run signal, in accordance with FSAR Section 8.3.1.1.11. The relay function, provided by software/firmware, is non-safety related.

Human-System Interface is through handswitches, meters and indicators, which are similar to existing components. There are no Video Display Unit screen displays. Both operator control panel and the multifunction generator protective relay have LED screens which display parameters and functions, and are scrolled by a keypad. No fundamental HSI changes result from this design.

There are no new accidents, failure modes, or malfunctions created by this change. Therefore prior NRC approval is not required for this proposed plant activity.

50.59 Evaluation No. - 59EV-2009-000859-01-01 **Units 1 and 2**

Title:

This evaluation for computer code upgrade from ANSYS version 5.4 to use ANSYS versions 12.0, 12.1 and 13.0 for seismic analyses.

Activity Description:

Seismic and structural analyses were performed on ancillary equipment provided under 10 CFR 72 in order to demonstrate conformance with UFSAR requirements. Those ancillary equipment that are "special lifting devices" required analyses to demonstrate conformance with the UFSAR Heavy Loads Program per the CoC Condition 5. Other ancillary equipment were required to demonstrate that they would not impact a safety related SSC or function through conformance with the UFSAR requirements for compliance with Position C.2 of RG 1.29 as Seismic Category II components. The required analyses were performed with ANSYS versions 12.0, 12.1 and 13.0. UFSAR Appendix 3.7B(A) described ANSYS version 5.4 as a general purpose finite element program used for seismic analyses and it is the most current version of the program. To use ANSYS versions 12.0, 12.1 and 13.0 for seismic analyses is a change in a methodology described in the UFSAR.

Summary of Evaluation:

The verification problem solutions generated by Holtec using ANSYS versions 12.0, 12.1 and 13.0 were compared to those obtained from ANSYS version 5.4. A total of 24 different verification problems were used in this comparison. The problem solutions were performed over a period of 13 years on several different computers and using three different operating systems. The initial comparison of results found the solutions to be identical for 17 of the verification problems.

An evaluation of the 7 problems that did not match was performed. Additional analyses were performed and input was obtained from ANSYS. The result was that the differences in the problem solutions were determined to be the result of user controlled options.

It is the conclusion of this Evaluation that the use of ANSYS versions 12.0, 12.1 and 13.0 as a computer aided method for performing analysis on a wide range of engineering problems will generate results that are essentially the same as those obtained from ANSYS version 5.4.

50.59 Evaluation No. - 59EV-2010-000011-01-00 **Units 1 and 2**

Title:

This evaluation supports a design modification to replace the Elgar UPS systems in CP1-ECPRLV-15 and CP2-ECPRLV-15 (respectively) with new UPS systems with digital controls.

Activity Description:

Replace the Elgar UPS systems in CP1-ECPRLV-15 and CP2-ECPRLV-15 (respectively) with new UPS systems with digital controls that resolve the maintenance and obsolescence issues. The replacement UPS performs an identical design function as the existing equipment, providing power for instrumentation at the Standby Transfer Panel for the ten minutes required to start diesel generators in the worst-case fire scenario requiring control room evacuation. The 10CFR50.59 Screen performed for the design modification determined the change in human system interface is considered adverse. This evaluation addresses this issue.

Summary of Evaluation:

The replacement UPS systems underwent analysis, review, and testing in accordance with a CPNPP procedure that addresses standards authorized for development of software systems discussed in EPRI TR-102348 R1/NEI 01-01, Guidelines for Licensing Digital Upgrades. The results of this evaluation conclude that the replacement equipment does not result in an increase in operator burden under either emergency or normal conditions. Implementation of this modification has been evaluated to not create malfunctions of equipment such as electrical or HVAC systems previously evaluated in the FSAR. This evaluation concludes no new accidents, failure modes, or malfunctions are created by implementing this modification.

50.59 Evaluation No. - 59EV-2010-000172-01-02 **Units 1 and 2**

Title:

This evaluation supports a design modification for replacing a manual gate valve 1(2)-8402A with a motor operated valve.

Activity Description:

The scope of this design modification includes work associated with replacing manual gate valve 1(2)-8402A with a motor operated valve.

The summary of activities included in this design modification includes the items listed below:

1. Replace 1(2)-8402A with a 3" motor operated gate valve.
2. Install a hand switch with valve position indication on the main control board, under the switch for 1(2)-HCV-0182.
3. Electrical raceway.

This new valve will be controlled at the Control Board with a hand switch of OPEN or CLOSE. The control switch will be used to isolate and bypass HCV-0182 during maintenance and in case of a fire to ensure that the normal charging path is isolated. Replacement of this manual operated valve with a motor operated gate valve will maintain all design and operational functions of the existing valve.

The 50.59 screening performed for the design modification determined the modification changes the human system interface by changing the valve actuator from a manual valve to a motor operated valve. The change in human system interface is considered adverse. This evaluation reviews the change to determine if a license amendment is required.

Summary of Evaluation:

Implementation of the design modification is considered adverse because the change includes a change from a complex manual action outside the control room to a simple action inside the control room in response to a fire in area SB and an additional failure mode that would impact the Chemical and Volume Control system function to maintain programmed water level in the RCS Pressurizer, to provide a boration path, and provide auxiliary pressurizer spray.

Valve 1(2)-8402A is located downstream of the piping connections which provides seal water injection flow to the RCP, and CVCS injection flow to the RCS following an actuation of the SIS. This change will not impact the functions to maintain seal water injection flow to the reactor coolant pumps or provide injection flow to the RCS following actuation of an SIS.

The loss of pressurizer level control, a loss of a path of boration injection and a loss of auxiliary spray are the malfunctions that could credibly occur as a result of the modification of valve 1(2)-8402A. The likelihood of these malfunctions is currently analyzed for Chapter 15 events and Seismic Event. This conservatively bounds the additional failure mode created by the addition of a motor operator to valve 1(2)-8402A.

The following changes to the FSAR assure that the above assumptions are and continue to be complied with.

- Addition of valve 1(2)-8402A to FSAR Table 9.3-6 with the failure modes and actions similar to those listed for CVCS isolation valves 1(2)-8105 and 1(2)-8106.

- Addition of valve 1(2)-8402A to FSAR Section 5A with the failure modes and actions similar to those described for CVCS isolation valves 1(2)-8105 and 1(2)-8106.

In summary, there is a minimal increase in the likelihood of occurrence of malfunctions of the pressurizer level control system, a boration path and auxiliary pressurizer spray system with this modification.

50.59 Evaluation No. - 59EV-2012-000009-01-00 **Units 1 and 2**

Title:

This evaluation is for upgrades to the fuel handling underwater lighting systems by installing high pressure sodium (HPS) lamps.

Activity Description:

Plant design modification upgrades the underwater lighting systems by installing high pressure sodium (HPS) lamps, each containing approximately 36.6 mg of mercury maximum, in the spent fuel pool, the fuel transfer canal, and the wet cask storage pit. This plant modification is needed to improve illumination and reliability of the lighting system while engaged in fuel handling operations, as well as reduce the cost of system maintenance and radwaste.

Of particular concern is an inadvertent release of mercury which could come into contact with the Spent Fuel Pool Cooling and Cleanup System, new or spent fuel assemblies, spent fuel storage racks or various related tools and components. Liquid mercury is known to promote liquid metal embrittlement of steel, resulting in premature intergranular cracking. This evaluation addresses that issue.

Summary of Evaluation:

The increase in the likelihood of the occurrence of a malfunction of an SSC important to safety due to the use of high pressure sodium underwater lighting in the spent fuel pool, the fuel transfer canal, and the wet cask storage pit is minimal based on the assurance that the mercury in the lamps is well contained in normal use and postulated plant events, loss of mercury is unlikely even if the arc tube were broken, adverse effects on the impacted materials is unlikely even if mercury was lost, and viable options exist to deal with lost mercury. Procedures have been revised to address lost parts analysis in the event of damage to a HPS light. Implementation of this plant modification will not affect frequency of occurrence or consequences of an accident. It will not adversely affect the fission product barrier (fuel clad). It does not involve a method of evaluation described in the FSAR. Therefore, this modification may be implemented under the provisions of 10CFR50.59.