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U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555
ATTN: David B. Matthews, Director
Division of New Reactor Licensing

SUBJECT: COMANCHE PEAK NUCLEAR POWER PLANT, UNITS 3 AND 4
DOCKET NUMBERS 52-034 AND 52-035
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION NO. 5981
(SECTION 12.3-12.4)

Dear Sir:

Luminant Generation Company LLC (Luminant) submits herein the response to Request for Additional Information (RAI) No. 5981 (CP RAI #225) for the Combined License Application for Comanche Peak Nuclear Power Plant Units 3 and 4. The RAI addresses zinc injection into the reactor coolant system.

Should you have any questions regarding this response, please contact Don Woodlan (254-897-6887, Donald.Woodlan@luminant.com) or me.

There are no commitments in this letter.

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

Executed on September 16, 2011.

Sincerely,

Luminant Generation Company LLC

Rafael Flores for

Attachment: Response to Request for Additional Information No. 5981 (CP RAI #225)

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NRO

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RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Comanche Peak, Units 3 and 4

Luminant Generation Company LLC

Docket Nos. 52-034 and 52-035

RAI NO.: 5981 (CP RAI #225)

SRP SECTION: 12.03-12.04 - Radiation Protection Design Features

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 8/15/2011

QUESTION NO.: 12.03-12.04-12

Title 10 of the Code of Federal Regulations (10 CFR), Part 20, "Standards for Protection Against Radiation," Section1101(b) "Radiation protection programs" requires that Occupational Radiation Exposures (ORE) be maintained as low as is reasonably achievable (ALARA) as defined in 10 CFR 20.1003, "Definitions", that is, making every reasonable effort to maintain exposure as low as possible. The guidance contained in Regulatory Guide (RG) 8.8 "Information Relevant for Ensuring that Occupational Radiation Exposures at Nuclear Power Stations is Reasonably Achievable," RG 1.206 Subsection C.I.12.3 "Radiation Protection Design Features" and Standard Review Plan Section 12.3-12.4 "Radiation Protection Design Features," state that control of Reactor Coolant System chemistry maintains ORE ALARA. 10 CFR 20.1406(b) "Minimization of contamination" requires licensees to describe design feature to reduce contamination of the facility, facilitate eventual decommissioning, and minimize, to the extent practicable, the generation of radioactive waste.

As noted in "Audit Report: June 23 - 24, 2009, "Health Physics Audit of the Comanche Peak Nuclear Power Plant, Units 3 and 4 Combined License Application" dated December 14th, 2009, ADAMS Accession Number ML092730382, Luminant stated that one of the ALARA design features specified in COL application Part 2, FSAR, Chapter 12, that would be implemented, was the zinc injection program.

US-APWR DCD Tier 2 Subsection 12.1.2.1 "General Design Considerations for Keeping Exposures ALARA" states that the US-APWR design supports the use of Zinc injection as one of the possible methods to reduce radiation exposure. Mitsubishi Heavy Industries (MHI), the applicant for the US-APWR DCD has stated that while the standard design does ensure that zinc injection can be employed and includes provisions for future implementation by applicants, the zinc injection system is not directly a part of the standard certified design, and no specific equipment is included for zinc injection in the standard certified design. Industry literature documents the impact zinc injection has on reducing ORE and reducing facility contamination.

Comanche Peak Nuclear Power Plant (CPNPP) Units 3 & 4 combined license (COL) FSAR Chapter 12 "Radiation Protection" does not state whether the applicant intends to use zinc injection, nor does CPNPP COL FSAR Chapter 9 "Auxiliary Systems" describe the locations of components, piping and interfaces to plant systems, of the zinc injection system, nor does CPNPP COL FSAR Section 12.3 "Radiation Protection Design Features" describe the use of the zinc injection components for ORE.

Please revise and update CPNPP COL FSAR Chapter 9 and Chapter 12 "Radiation Protection" to describe the use of zinc injection at CPNPP, and to include the description of the locations of components, piping and interfaces of the zinc injection system to plant systems described in the CPNPP COL FSAR Chapter 9, or provide the specific alternative approaches used and the associated justification.

ANSWER:

FSAR Sections 5.2, 9.3, and 12.3 have been revised to include information describing the zinc injection system.

Impact on R-COLA

See marked-up FSAR Revision 2 pages 5.2-1, 5.2-2, 9.3-2, and 12.3-1.

Impact on S-COLA

None.

Impact on DCD

None.

5.2 INTEGRITY OF REACTOR COOLANT PRESSURE BOUNDARY

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

5.2.1.1 Compliance with 10 CFR 50, Section 50.55a

STD COL 5.2(11) Replace the third sentence of the second paragraph in DCD Subsection 5.2.1.1 with the following.

The licensee uses ASME Code editions and addenda that is the same as those specified in the US-APWR DCD Table 5.2.1-1 and DCD Subsection 3.9.10, Reference 3.9-13.

5.2.1.2 Compliance with Applicable Code Cases

Replace the third paragraph in DCD Subsection 5.2.1.2 with the following.

STD COL 5.2(1)
STD COL 5.2(2)
STD COL 5.2(3)

The licensee uses no Code Cases listed in Regulatory Guide (RG) 1.84 beyond those listed in the referenced DCD. The use of Code Cases including those listed in RG 1.147 is identified in the inservice inspection (ISI) program (Subsection 5.2.4 and Section 6.6). The use of Code Cases including those listed in RG 1.192 is identified in the inservice testing (IST) program (Subsection 3.9.6 and 5.2.4).

5.2.3.2.1 Chemistry with Reactor Coolant

STD COL 5.2(12) Replace the second sentence of the third paragraph with the following.

The reactor coolant chemistry control program is based on the latest effective version of the EPRI Water Chemistry Guidelines.

CP SUP 5.2(1) Add the following at the end of the eighth paragraph. RCOL2_12.03-12.04-12

The CPNPP Units 3 and 4 design incorporates this option with a target concentration of 5 ppb. (Subsection 9.3.4.2.3.3) RCOL2_12.03-12.04-12

5.2.4.1 Inservice Inspection and Testing Program

STD COL 5.2(4) Replace the first sentence of the fourth paragraph in DCD Subsection 5.2.4.1 with the following.

The implementation milestones for the ISI program and the IST program are provided in Table 13.4-201.

Add the following text after the first sentence of the fifth paragraph in DCD Subsection 5.2.4.1.

The boric acid corrosion control program (BACCP) includes procedures for determining the principal locations where leakage may cause degradation of the primary pressure boundary by boric acid corrosion. Procedures for controlling leakage include provisions to detect and locate small leaks using on-line leakage monitoring and/or visual inspection. Leakage that is below allowable Technical Specification limits is detected by indication and trending of on-line leakage detection data gathered from containment sump level and flow monitoring, containment air cooler condensate flow rate monitoring, containment airborne particulate radioactivity monitoring, humidity, temperature, and pressure monitoring of the containment atmosphere, and observing gross leakage from changes in the reactor coolant inventory. If a trend indicates reactor coolant leakage, operators are trained to take action to identify possible leak locations.

In addition, the following visual inspections are routinely conducted in order to identify leakage.

- Visual inspection of accessible and observable components during system walkdowns (including walkdowns conducted early in the outage to ensure evidence of RCS leakage, such as boric acid deposits at the leakage sites, is not disturbed prior to engineering evaluation).
- Visual inspections during plant outages (including bare metal inspection of specific components that have higher risk of corrosion).

The BACCP also contains methods for conducting examinations, performing engineering evaluations to establish the impact on the reactor coolant pressure boundary when leakage is located, and establishing corrective actions to prevent recurrences of this type of corrosion.

The carbon dioxide gas is supplied from the carbon dioxide gas cylinders located close to the equipment if practical or in the compressed gas farm. The carbon dioxide gas cylinders in the gas farm supply carbon dioxide gas to both units.

Miscellaneous Gases

Other gases for the oxygen gas analyzer and the automatic gas analyzers are supplied from gas cylinders located close to the analyzers.

Figure 9.3.1-201 shows the Hydrogen and Nitrogen Gas Supply Configuration.

9.3.1.2.2.3 Compressed Gas System

STD COL 9.3(1) Replace the content of DCD Subsection 9.3.1.2.2.3 with the following.

The compressed gas system consists of gas sources as described in Subsection 9.3.1.2.1.3 and the distribution headers, distribution piping, and the associated valves and instrumentation.

9.3.2.2.5 Steam Generator Blowdown Sampling System

CP CDI Replace the phrase “waste water system” in the third paragraph of DCD Subsection 9.3.2.2.5 with “existing waste water management Pond C.”

9.3.3 Equipment and Floor Drainage Systems

CP CDI Throughout DCD Subsection 9.3.3, replace “waste water system (WWS)” with “existing waste water management Pond C.”

CP SUP 9.3(1) Add the following after Subsection 9.3.4.2.3.2. RCOL2_12.03-12.04-12

9.3.4.2.3.3 Zinc Injection System

A soluble zinc (Zn) compound depleted of Zn-64 is injected into the reactor coolant to reduce radiation fields within the primary system. The zinc injection system consists of a tank, pumps, piping, a check valve, and a manual isolation valve. The system injects into the common charging pump suction line between the seal water heat exchanger and the discharge from the volume control tank. The system maintains a target Zn concentration of 5 ppb with a limiting value of 10 ppb.

12.3 RADIATION PROTECTION DESIGN FEATURES

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

12.3.1.1.1.2 Balance of Plant Equipment

Add the following information at the end of DCD Subsection 12.3.1.1.1.2.

STD COL 12.3(6)
STD COL 12.3(7)
STD COL 12.3(8)

N. Mobile Liquid Waste Processing System

The mobile liquid waste processing system is located in the Auxiliary Building, and treats the effluent prior to discharging it to the waste monitor tank. This system is designed to comply with SRP Section 12.3-12.4, RG 1.206 and RG 1.69. As described in Subsection 11.2.1.6, provisions are included to mitigate contamination, and the system complies with 10 CFR 20.1406. The mobile liquid waste processing system is located in a radiation zone III area. Shield walls are provided for the system in order to allow the surrounding area to maintain a radiation zone III designation.

CP SUP 12.3(1)

O. Zinc Injection System RCOL2_12.03-12.04-12

Injecting a soluble zinc (Zn) solution depleted of Zn-64 into the reactor coolant system (RCS) limits corrosion products by depositing zinc on the inner surface of RCS components. This reduces occupational radiation exposure by reducing the portion of the source term derived from the irradiation of erosion and corrosion products such as Co-60. (Subsection 9.3.4.2.3.3)

12.3.1.2.1.1 Radiation Zoning

STD COL 12.3(4) Replace the fourth sentence of the fourth paragraph in DCD Subsection 12.3.1.2.1.1 with the following.

Site radiation zones for plant arrangement plan under normal operation/shutdown conditions are shown in Figure 12.3-1R (COL information provided on Sheet 1 of 34).
