PMComanchePeakPEm Resource

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Sent: Monday, October 05, 2009 1:21 PM
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Cc: Otto, Ngola; ComanchePeakCOL Resource
Subject: Comanche Peak RCOLA - Section 12.3-4 - RAI # 119
Attachments: RAI 3318 (RAI 119).doc

The NRC staff has identified that additional information is needed to continue its review of the combined license application. The NRC staff's request for additional information (RAI) is contained in the attachment. Luminant is requested to inform the NRC staff if a conference call is needed.

The response to this RAI is due within 35 calendar days of October 5, 2009

Note: If changes are needed to the safety analysis report, the NRC staff requests that the RAI response include the proposed changes.

thanks,

Stephen Monarque
U. S. Nuclear Regulatory Commission
NRO/DNRL/NMIP
301-415-1544

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Request for Additional Information (RAI) No. 3318

RAI # 119

10/5/2009

Comanche Peak Units 3 and 4
Luminant Generation Company, LLC.
Docket No. 52-034 and 52-035
SRP Section: 12.03-12.04 - Radiation Protection Design Features
Application Section: SRP 12.3-12.4

QUESTIONS for Health Physics Branch (CHPB)

12.03-12.04-2

NEI 07-03A notes that each COL applicant will demonstrate compliance with 10 CFR 20.1602 by including in their application a description of each Very High Radiation Area (VHRA) and associated additional administrative controls for restricting access to each Very High Radiation Area. In accordance with the provisions of NEI 07-03A Revision 0 Section 12.5.4.4 Access Control, site specific information that the applicant will provide to supplement the template, and which will be reviewed separately by the NRC staff, includes:

- Providing a description of each Very High Radiation Area (VHRA)
- Providing the reasons for accessing each VHRA
- Providing the anticipated frequency of accessing each of the Very High Radiation Areas, including a description of the additional administrative controls to be employed for restricting access to each Very High Radiation Area as required by 10 CFR 20.1602, consistent with the guidance of RG 8.38, 'Control of Access to High and Very High Radiation Areas in Nuclear Power Plants,' Revision 1 (May 2006).
- Provision of drawings that show the location of each Very High Radiation Area in plant layout diagrams in FSAR Section 12.3-4.
- Provision of detailed drawings for each Very High Radiation Area in FSAR Sections 12.3-4 that indicate physical barriers sufficient to thwart undetected entry, or an explanation of how such barriers to the Very High Radiation Areas will be verified in the final design of the facility.

In accordance with the requirements of 10 CFR 20.1602, the guidance of RG 8.38 and the provisions of NEI Template 07-03A Rev. 0, the applicant is requested to revise and update the FSAR to provide the information noted, above, or describe and justify the specific alternate approaches employed.

12.03-12.04-3

10 CFR 20.1501 requires that radiation protection instrumentation be periodically calibrated. NUREG-0800, Standard Review Plan (SRP) Section 12.3-12.4 and RG 1.206 C.III subsection C.I.12.5.2 note that the applicant is to provide the criteria for selection and the method of calibration of portable and laboratory radiation protection instrumentation. NEI 07-03 12.5.4.1 Radiological Surveillance notes that instruments are calibrated prior to initial use and at least annually thereafter. The US-APWR DCD FSAR Tier 2 section 12.3.4 describes Area and Airborne Radioactivity Monitoring Instrumentation and notes that procedures for the calibration of Portable Personnel Monitors and Radiation Survey Instruments are to be provided by the COL applicant. NEI 07-03 and NEI 07-08 do not specify any criteria for the selection or calibration of portable radiation protection instrumentation.

In accordance with the requirements of 10 CFR 20.1501, and the intent of the guidance provided in RG 1.206 and SRP Section 12.3-12.4, the applicant is requested to revise and update the FSAR to describe the methods of selection and calibration of portable radiation protection instrumentation, or describe and justify the specific alternate approaches employed.

12.03-12.04-4

10 CFR Part 50, Appendix A, General Design Criteria (GDC) GDC 61 and GDC 63 requires that facilities for waste be designed to ensure adequate safety. Generic Letter 81-38 provides guidance regarding considerations for interim waste storage facilities. 10 CFR 20.1801 requires licensees to secure from unauthorized removal or access, additional materials that are in storage in controlled or unrestricted areas. The US-APWR FSAR Tier 2 Section 12.2.3 COL 12.2(1) notes that the applicant is responsible for identifying any additional sources of radiation that are not identified in FSAR Tier 2 Section 12.2.1. Comanche Peak Nuclear Power Plant (CPNPP) FSAR 12.2.1.1.10 notes that CPNPP, Units 3 and 4 waste will be stored in an Interim Radioactive Waste Storage Facility, to be constructed outside the plant structures. The stated intent of the applicant is to use this COL submittal process as the approval mechanism for the additional storage facility; however, the applicant has not provided any design information consistent with GDC 61 and GDC 63, or the guidance of Generic Letter 81-38 that will allow the NRC staff to determine that the storage facility provided will assure a reasonable assurance of safety.

In accordance with the requirements of 10 CFR 20.1801, GDC 61 and 63, and the intent of the guidance provided in SRP Section 12.3-12.4 and Generic Letter 81-38, the applicant is requested to revise and update the FSAR to describe the design features of the Interim Radioactive Waste Facility, or describe and justify the specific alternate approaches employed.

12.03-12.04-5

The dose limits to the construction workers are reviewed by the NRC staff against the Regulation 10 CFR 20.1301, which states in (a)(1) “The total effective dose equivalent to individual members of the public from the licensed operation does not exceed 0.1 rem (1 mSv) in a year”. CPNPP FSAR Chapter 12.4.1.9.4.1 Direct Radiation and Environmental Report Part 3 - Environmental Report, Section 4.5 'Radiation Exposure to Construction Workers,' notes that the refueling water storage tanks are the principal contained sources that could contribute to direct radiation exposure at the construction site. These sections of the FSAR and ER evaluate the potential radiological dose impacts to construction workers at the CPNPP resulting from the operation of CPNPP, Units 1 and 2. They note that CPNPP Units 1 and 2 have a general area monitoring program that monitors various points inside the protected area. They state that the limiting cumulative dose rate is 0.001 mrem/hr from the protected area fence thermo-luminescent dosimeter (TLD) readings for 2006. However, these sections fail to account for doses from other sources such as: the current Interim Waste Storage for CPNPP, Units 1 and 2, shipment/receipt of CPNPP, Units 1 and 2 outage support equipment and materials, movement of radioactive materials during CPNPP, Units 1 and 2 outages and other radioactive material storage areas of CPNPP, Units 1 and 2. Some of these areas have dose rate limits at the restricted area fence boundary as high as 0.5 mrem/hr. Since some of the construction work is located at the Waste Water Treatment Facility adjacent to CPNPP, Units 1 and 2, dose sources may be located closer to some Construction Workers than the assumed 1000 ft distance to the Independent Spent Fuel Storage Installation Facility, or the protected area fence surrounding CPNPP, Units 1 and 2. Since neither the CPNPP, FSAR Section 12.4 or the CPNPP Environmental Report Chapter 3, Section 4.5 describes the location of the TLDs used to determine the construction worker dose estimates, it is not clear if the reported values are bounding for all of the onsite construction workers.

The applicant is requested to revise and update the CPNPP FSAR Section 12.4 to:

- Describe all of the sources that may be a source of exposure to construction workers.
- Provide a figure that depicts the location of the fence TLDs used to perform the construction worker dose estimates.

Alternately, the applicant may describe and justify the use of different approach.

12.03-12.04-6

CPNPP COL FSAR section 12.4.1.9 provides a description of the potential sources of exposure to construction workers. The dose limits to the workers are reviewed by the staff against the standards of 10 CFR 20.1301. 10 CFR 20.1301 (a)(1) states "The total effective dose equivalent to individual members of the public from the licensed operation does not exceed 0.1 rem (1 mSv) in a year".

1. The CPNPP COL FSAR subsection 12.4.1.9.4.3 discusses sources of exposure from effluents to site construction workers, but the FSAR does not include potential exposure to liquid effluents from Units 1 & 2 while workers are performing liquid waste effluent discharge piping connections.

   The applicant is requested to revise and update the COL FSAR subsection 12.4.1.9.4.3 to describe this potential source of exposure. The revision information should include the potential contribution to construction worker exposure and provide sufficient information to demonstrate that the standards of 10 CFR 20.1301 are met concerning the estimated dose to construction workers due to the liquid waste effluent discharge piping connection between the operating Units, 1 and 2 and proposed Units 3 and 4. Alternately, the applicant could describe and justify the use of different approach.

2. The CPNPP COL FSAR subsection 12.4.1.9 discusses sources of exposure from operating reactors, other than CPNPP, Units 1 and 2, to site construction workers. It notes that construction work from low power testing at less than 5 percent power at CPNPP, Unit 3, is not expected to present a significant source of exposure to the construction workers. However, there is no discussion of the controls or reviews that are required prior to operation of one of the units at a power level greater than 5 percent while construction work is still in progress, nor does it address the condition of operation of CPNPP, Unit 4, while construction work is still in progress.

   The applicant is requested to revise and update the COL FSAR subsection 12.4.1.9 to describe the controls and reviews that are required prior to exceeding 5 percent power at either CPNPP, Units 3 or 4, while construction workers are on site. The revision information should include the potential contribution to construction worker exposure from both units, and provide sufficient information to demonstrate that the standards of 10 CFR 20.1301 are met, concerning the estimated dose to construction workers due to operation of Units 3 and 4. Alternately, the applicant may describe and justify the use of different approach.

3. 10 CFR 20.1101(a) & (b) note that the licensee is have a radiation protection program, sufficient to ensure compliance with 10 CFR Part 20, and to use sound radiation protection principles, to the extent practical, to achieve doses to members of the public that are ALARA. The CPNPP Environmental Report Part 3, Section 4.5 notes that actions to reduce worker exposure could include monitoring and the use of work plans to reduce construction worker exposure.

   The applicant is requested to revise and update the COL FSAR subsection 12.4.1.9 to describe the Construction Worker ALARA program. The revision

information should include the implementation milestone dates, and provide sufficient information to demonstrate that the standards of 10 CFR 20.1101(a), (b), 1301 and 1302 are met, concerning maintaining dose to construction workers ALARA. Alternately, the applicant may describe and justify the use of different approach.

12.03-12.04-7

10 CFR 20.1406 requires a program for minimizing contamination of the facility and the environment and facilitation of the eventual decontamination of the facility. Regulatory Guide 4.21, 'Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning,' Appendix A-3 “Facilitating Decommissioning” notes that Plans and procedures to facilitate decommissioning should include comprehensive video records of the equipment layout in areas where radiation fields are expected to be high following operations and further notes that construction records should include global positioning system readings that pinpoint all buried component locations, particularly components in the site environs. NEI Template 08-08 “Generic FSAR Template Guidance for Life-Cycle Minimization of Contamination” endorses the guidance of EPRI report TR-1016099 “Groundwater Protection Guidelines for Nuclear Power Plants – Public Edition”. TR-1016099 notes in several locations that photographs taken during the construction phase that show foundations, pipes, conduits and other below grade structures should be used as part of the site conceptual model. Contrary to the guidance provided in the noted documents, COL FSAR Chapter 12 does not describe the intended practices with respect to documentation actual structures located below grade or in high radiation areas of the plant.

The applicant is requested to revise and update the FSAR Chapter 12.3 to describe the methods that will be used to provide as built construction details needed to support the continual maintenance of the Conceptual Site Model for groundwater movement, and the facility decommissioning efforts, or the applicant may describe and justify the use of different approach.

12.03-12.04-8

10 CFR 20.1001(b) states in part: (b) It is the purpose of the regulations in this part to control the receipt, possession, use, transfer, and disposal of licensed material by any licensee in such a manner that the total dose to an individual (including doses resulting from licensed and unlicensed radioactive material and from radiation sources other than background radiation) does not exceed the standards for protection against radiation prescribed in the regulations in this part. . . ."

For the purposes of the NRC staff's review of radiation protection program elements for an applicant for a combined license (COL), a large percentage of the many anticipated construction workers are considered to be members of the public for the purposes of exposure control, estimates of dose, training, and dosimetry. Public dose is as defined in 10 CFR 20.1003, which notes that it includes the dose received by a member of the public from exposure to ". . . any other source of radiation under the control of a licensee, . . ." exclusive of occupational, background, or medical administrations.

NUREG-1736 provides further guidance, noting the limits for public dose from licensed activities, including dose from transient activities (i.e., dose in any one hour) and cumulative activities over a year, and further notes that this regulation is applicable to all NRC licensees whose activities may result in exposure to members of the public.

In addressing the requirements of 10 CFR 20.1101, NUREG-1736 also notes that the licensee must have a written radiation protection program to reduce exposure, including to members of the public, with such review to be performed at least annually.

Based on the foregoing, the applicant is requested to revise and update FSAR Chapter 12.4 to further describe information regarding the origin and justification for exposure resulting from licensee related activities, such as construction related radiography and other uses of radioactive materials, and the radiation program elements associated with maintaining Construction Worker doses ALARA consistent with NUREG-1736, or describe the specific alternate approaches and the associated justification.