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November 7, 2011

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
SUPPLEMENTAL RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION NO. 5854 (SECTION 11.2)

Dear Sir:

As a result of an October 5, 2011 call with the NRC staff, Luminant Generation Company LLC (Luminant) submits herein supplemental information for the response to RAI No. 5854 (CP RAI #224) for the Combined License Application for Comanche Peak Nuclear Power Plant Units 3 and 4. The supplemental information addresses the design of the evaporation pond.

Should you have any questions regarding the supplemental information, 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 November 7, 2011.

Sincerely,

Luminant Generation Company LLC

RDB for

Rafael Flores

Attachment: Supplemental Response to Request for Additional Information No. 5854 (CP RAI #224)

D09D
NRO

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SUPPLEMENTAL 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.: 5854 (CP RAI #224)

SRP SECTION: 11.02 - Liquid Waste Management System

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 8/9/2011

QUESTION NO.: 11.02-18

The staff's review of FSAR Section 11.2 and of the applicant's responses to related RAIs on the evaporation pond found that design information on site-specific sample points and locations was not fully described. These site-specific sample points, that ensure that representative samples of the evaporation pond are taken before its contents are transferred to the SCR via the CPNPP Units 1 and 2 circulating water return line, are planned to be located during the "detailed design." In FSAR Section 11.2, please describe the "detailed design" information on the site-specific sample points and locations; discuss the operational program and applicable procedures and NRC guidance; and identify the sample points and locations on a P&ID of the evaporation pond that will satisfy its stated design objective.

SUPPLEMENTAL INFORMATION:

The sampling procedures for the evaporation pond are governed by the Offsite Dose Calculation Manual (ODCM), which adopts NEI 07-09A as described in FSAR Subsection 11.5.2.9. NEI 07-09A fully describes elements of the process and effluent monitoring and sampling programs required by 10 CFR 50, Appendix I and 10 CFR 52.79 (a)(16). NEI 07-09A Subsection 6.4.1 states that liquid releases shall be characterized using sampling and analytical procedures to assess the amounts of radioactivity being released to the environment and for determining doses to offsite receptors. Further, NEI 07-09A Section 7 lists the references used in developing the template, including NUREG-1301 and RG. 1.21. Thus, guidance from these two documents is incorporated in NEI 07-09A, as reviewed and approved by the NRC, and is included in the ODCM by adopting NEI 07-09A.

The FSAR has been supplemented to respond to feedback provided during a conference call with the NRC staff on October 5, 2011 and to make editorial changes.

A markup of FSAR Subsection 2.4.13 was provided in the original response to this RAI. The markup provided in Subsection 2.4.13 is not necessary and is being removed by this supplement. The discussion of the evaporation pond does not belong in Subsection 2.4.13 because it is not a part of the LWMS. The discharge to the evaporation pond meets the ECL's except for tritium, which is discussed in FSAR Section 11.2. Section 11.2 also discusses that an evaporation pond failure is bounded by the failure analysis of the boric acid tank. The complete discussion of the evaporation pond is contained in FSAR Section 11.2 and no further discussion is necessary in Subsection 2.4.13.

Impact on R-COLA

See attached marked-up FSAR Revision 2 pages 2.4-97, 11.2-3, 11.2-4, 11.2-8, 11.2-16, 11.2-17 and Figure 11.2-201, Sheet 9.

Impact on S-COLA

None; this response is site-specific.

Impact on DCD

None.

Refueling Water Storage Auxiliary Tank - located outside

Chemical Drain Tank - located in the A/B

The Volume Control Tank, the Chemical Drain Tank, and Sump Tanks were eliminated from consideration based on smaller volumes and lower radionuclide contents than the Boric Acid Tank (BAT). ~~The evaporation pond contains treated liquid effluents in trace amounts of radionuclide content that meet discharge requirements specified in 10 CFR 20 Appendix B, Table 2, and has radionuclide contents below that of the boric acid tank contents. Hence, the contamination level due to the failure of the evaporation pond is bounded by the failure of the boric acid tanks.~~The Primary Makeup Water Tank was eliminated from consideration based upon the fact that the Primary Makeup Water Tank stores demineralized water from the Treatment System and low level radioactive condensate water from the Boric Acid Evaporator. Condensate water contains low levels of radionuclide concentrations. including tritium. Additionally, the Refueling Water Storage Auxiliary Tank (RWSAT) was eliminated from consideration because it stores refueling water. Prior to refueling, tank water is supplied to the refueling cavity where the reactor coolant radionuclide concentration dilutes with refueling cavity water. Radionuclide concentration of cavity water is reduced by the purification system of the Chemical and Volume Control System (CVCS) and the Spent Fuel Pit Cooling and Purification System (SFPCS) during refueling operations. Upon refueling completion, part of the cavity water is returned to this tank where the radionuclide concentration is low. Accordingly. the impact of RWST or Primary Makeup Water Storage Tank failure is small. RCOL2_11.02-18 RCOL2_11.02-18 S01

After eliminating the tanks described above, the remaining tanks left to consider for the failure analysis are those in the A/B, which is a seismic category II Building. As shown in DCD Figure 1.2-29, these tanks are located on the lowest elevation of the A/B at elevation 793 ft ms. In selecting the appropriate tank for the failure analysis, the guidance in Branch Technical Position (BTP) 11-6 was utilized based upon the concentrations generated from the RATAF Code for Pressurized Water Reactors. The concentration of the radioactive liquid in the tanks, such as the Boric Acid Evaporator, the Holdup Tank, and the BAT, are larger than the Waste Holdup Tank since they receive reactor coolant water extracted from the Reactor Coolant System. Since the enrichment factor of 50 is considered for the liquid phase of the Boric Acid Evaporator. the radioactive concentrations in the liquid phase of the Boric Acid Evaporator, and in the BAT (which receives the enriched liquid from the Boric Acid Evaporator) becomes large when compared to the other tanks. The BAT has been selected since its volume is larger than the liquid phase of the Boric Acid Evaporator. Credit is taken for the removal effect by demineralizers or other treatment equipment for the liquid radioactive waste prior to entering the tank. No chelating agents are used in the plant system design in order to provide chemical control of the reactor-coolant. Only a very small amount of chelating agents is used in the sampling system for analysis. The sampling drain, which contains only a small amount of chelating agents is directly sent to the dedicated chemical drain tank and treated separately. Chemical agents used in laboratory analysis are also sent to the chemical drain tank for treatment.

The temporary mobile/portable equipment installed in the LWMS is vendor-supplied and operated within the specified requirements. The temporary mobile/portable equipment includes the necessary connections and fittings to interface with the plant piping. The connectors are uniquely designed to prevent inadvertent cross connection between the radioactive and non-radioactive plant piping. The piping also includes backflow inhibitors. Liquid effluent from the temporary mobile/portable equipment is routed to the LWMS. An operating procedure will be provided prior to fuel load to ensure proper operation of the temporary mobile/portable equipment to prevent contamination of non-radioactive piping or uncontrolled releases of radioactivity into the environment so that guidance and information in Inspection and Enforcement (IE) Bulletin 80-10 (Ref. 11.2-25) is followed.

11.2.2 System Description

CP COL 11.2(2) Replace third paragraph in DCD Subsection 11.2.2 with the following.

CP COL 11.2(6)

Process flow diagrams with process equipment, flow data, tank batch capabilities, and key control instrumentation are provided to indicate process design, method of operation, and release monitoring for the site specific liquid waste management system (LWMS).

Figure 11.2-201, Sheets 1 through 10 illustrate the piping and process equipment, instrumentation and controls for Comanche Peak Nuclear Power Plant (CPNPP) Units 3 and 4 LWMS.

The Liquid Waste Management System (LWMS) boundary ends at the discharge isolation valve and the radiation monitor of the discharge header from the waste monitor tanks, which is considered the controlled discharge point. The evaporation pond is not part of the LWMS because the pond only contains treated effluent for discharge. Unlike the waste monitor tanks, which could contain off-specification effluent that may need to be re-processed; the evaporation pond is designed to manage the tritium concentration in the SCR by providing temporary holdup of treated effluent for discharge.

The treated liquid effluents released from the CPNPP Units 3 and 4 and the evaporation pond are piped directly into the Unit 1 Waste Management System (WMS) flow receiver and head box, which includes the discharge flume. The effluents enter from the top of the receiver and head box and are above the liquid level in the box so that they flow freely into the box, from where the content flows to the Unit 1 WMS discharge flume, and by gravity to the Unit 1 Circulating Water System (CWS), via an existing Unit 1 pipeline connecting the WMS to the CWS. ~~At this pipeline intersection, the~~The Unit 3 and 4 treated effluent and the Unit 3 and 4 evaporation pond effluents are commingled with various Unit 1 and 2 waste effluent streams. This Unit 1 circulating water flow path then goes to the Unit 1 condenser water box outlet, where it joins the Unit 2 condenser water box outlet RCOL2_11.02-18 S01 flow. The joined flows from the ~~Unit 1 and 3~~ condenser water boxes are then sent to the SCR via the Unit 1 and 2 discharge tunnel and outfall structure from all four units (see Figure 11.2-201 Sheet 10) for a visual representation of the above described flow path. RCOL2_11.02-18 S01

~~The header where the WMS intersects with the CWS is located within the Unit 1 Turbine building. The header contains two flow balancing valves (1CW-247 and 1CW-248) for Units 1 and 2.~~ This arrangement ensures that there is always circulating cooling water flow for Unit 1 and/or Unit 2~~. The circulating water discharge piping then becomes progressively larger and flows freely (no valves) into the Unit 1 condenser water discharge box. This flow path also ensures~~ and that there is less back pressure into the treated effluent flow. Based on the fact that the effluent piping flows freely into the box and that there is less back pressure, there is no need for a mixing orifice and backflow preventer, as the large circulating water return flow and length of pipe is sufficient to thoroughly mix the release. RCOL2_11.02-18 S01

The bypass valve, VLV-531, is located in the same area with the radiation monitor and the discharge control valves (RCV-035A and RCV-035B), which are inside the Auxiliary Building. All normal discharge is required to go through the discharge control valves. To ensure discharge operation is not prevented by the failure of the control valves at any time, a bypass valve is added around the radiation monitor and the discharge control valves. Plant procedures require that an operator verify the tank water radioactivity concentration by sampling and water volume by level indicator prior to a liquid effluent release via the bypass valve. The ODCM and supporting procedures ensure appropriate actions to prevent an unmonitored release.

Any leakage from the piping and the valves inside the buildings is collected in the floor drain sump, and is forwarded to the waste holdup tank for re-processing. It should be noted that the discharge control valves are downstream of the discharge isolation valve (AOV-522A and AOV-522B). During normal operations, the discharge is anticipated to occur once a week for approximately three hours for treated effluent, and one discharge (approximately an hour at 20 gpm) of detergent waste (filtered personnel showers and hand washes) daily. After each discharge, the line is flushed with demineralized water for decontamination.

The bypass valve is normally locked-closed and tagged. It requires an administrative approval key to open and the valve position is verified by at least two technically qualified members of the CPNPP Operations staff before discharge can start. Thus, a single operator error does not result in an unmonitored release. In the unlikely event that the valve is inadvertently left open, or partially open, the flow element detects flow and initiates an alarm for operator action. Also, a portion of the flow continues to flow through the radiation monitor sample chamber. Because the monitor output depends on radionuclide concentration and not flow rate, there is no impact on radiation monitor sensitivity from reduced flow conditions. Prior to opening VLV-531 to establish the alternate flow path, the tanks (ATK-006A and ATK-006B) will be sampled and water volume emission amounts to 2.73E+00 mrem/yr (Adult's GI-Tract) described in FSAR Table 11.3-205, which is well within the 10 CFR Appendix I limit. Based on the above, the evaporation pond meets the acceptance criteria of SRP 11.2. ~~With regards to RG 1.143,~~ RG 1.143 does not provide any guidance on specific design requirements for an evaporation pond. Hence RG 1.143 is not applicable to the ~~desing~~design of the evaporation pond. According to NUREG-0543 (Reference 11.2-202), there is reasonable assurance that sites with up to four operating reactors that have releases within Appendix I design objective values are also in conformance with the EPA Uranium Fuel Cycle Standard, 40 CFR 190. Once the proposed ~~CPNPP~~ Units 3 and 4 are constructed, the Comanche Peak site will consist of four operating reactors. RCOL2_11.02-18 RCOL2_11.02-18 RCOL2_11.02-18 S01 RCOL2_11.02-18

11.2.3.2 Radioactive Effluent Releases Due to Liquid Containing Tank Failures

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CP COL 11.2(3) Replace the last sentence in the second paragraph in DCD Subsection 11.2.3.2 with the following.

Source term for each tank is provided in the DCD and the assessment of this model using the site-specific parameters to evaluate the conservatism of this analysis is described below.

CP COL 11.2(3) Replace the first two sentences in the last paragraph in DCD Subsection 11.2.3.2 with the following.

The evaluation of potential radioactive effluent releases to surface water or groundwater due to failure of the ~~holdup tank~~boric acid tank is provided in Subsection 2.4.13. Releases from this tank result in concentrations at the nearest unrestricted potable water supply that are within the limits of 10 CFR 20, Appendix B (Ref 11.2-8). RCOL2_11.02-18 RCOL2_11.02-18 S01

CP SUP 11.2(1) Add the following Subsection after DCD Subsection 11.2.3.3.

11.2.3.4 Evaporation Pond

The primary purpose of the evaporation pond is to ~~provide a means to~~ receive, store, and process treated radioactive effluent from the ~~CPNPP Units 3 and 4 liquid radioactive waste management systems~~LWMS when ~~the tritium concentration in Squaw Creek Reservoir is approaching the ODCM limit.~~it is RCOL2_11.02-18

Additional manholes are provided for testing and inspection for the buried piping. Each manhole is equipped with drain collection basins and leak detection instruments to send the signal when activated by fluid in the manhole to a receiver in the Main Control Room (MCR) for operator action. This design approach minimizes leakage and provides accessibility to facilitate periodic testing (hydrostatic or pressure), or visual inspection to maintain pipe integrity and is compliant with RG 4.21. A back flow preventer is provided near the CPNPP Units 1 and 2 discharge boxes to prevent back flow from the circulating pipe. RCOL2_11.02-18

The evaporation pond discharge pump also acts as a recirculation pump for the pond. The pond is recirculated sufficiently to obtain a representative sample at the discharge pump before discharging the pond contents to the CPNPP Unit 1 flow receiver and head box. The procedures for recirculation and sampling are governed by the site-wide ODCM, which adopts NEI 07-09A, thus addressing NRC guidance such as NUREG-1301 and RG 1.21. RCOL2_11.02-18 S01

The evaporation pond discharge pump and discharge isolation valve are under supervisory control. RCOL2_11.02-18

Evaporation Pond Design Summary:

Volume: 2.1 million gallon net capacity

Surface area: 1.5 acre

Depth: Total 6 feet deep (4 feet liquid depth with 2 feet freeboard)

Type: Open with no cover

Liner material: High Density Polyethylene, 60 mils, two layers

Permeability: 1×10^{-7} cm/sec

The evaporation pond contains treated liquid effluents in trace amounts that meet discharge requirements specified in 10 CFR 20 Appendix B, Table 2, and has radionuclide contents below that of the boric acid tank contents. Hence, the contamination level due to the failure of the evaporation pond is bounded by the failure of the boric acid tanks.

The evaporation pond is designed to meet and operate in accordance with RG 4.21. Preventive maintenance, monitoring and routine surveillance programs are an important part to minimize the potential for contamination. Leakage detection design, radiation monitors are added for early detection to prevent spread of contamination. The current CPNPP pond management program is expanded to include the above requirements for the evaporation pond and its supporting components including the radiation monitor, pumps and valves.

Operating procedures limit the use of the evaporation pond to receive treated effluent on an as-needed basis and the pond will be washed each time it is emptied. Sampling procedures confirmrequire that the tritium concentration in the SCR is confirmed to be below the pre-determined setpoint, and that the effluent is acceptable for release before the evaporation pond contents are discharged to SCR. The tritium sampling procedures will beare included ingoverned by the site-wide ODCM, which will be part of Radiological Effluent Controls Program. The Radiological Effluent Controls Program already has an implementation milestone established as shown in Table 13.4-201. RCOL2_11.02-18 RCOL2_11.02-18 RCOL2_11.02-18 S01

11.2.4 Testing and Inspection Requirements

CP COL 11.2(7) Add the following sentences to the end of the last paragraph of DCD Subsection 11.2.4.

The licensee has an Epoxy Coatings Program used to facilitate the ALARA objective of promoting decontamination in radiologically controlled areas outside containment. The program controls refurbishment, repair, and replacement of coatings in accordance with the manufacturers' product data sheets and good painting practices. The program will be implemented as described in FSAR Table 13.4-201.

11.2.5 Combined License Information

Replace the content of DCD Subsection 11.2.5 with the following.

STD COL 11.2(1) ***11.2(1)*** *The mobile and temporary liquid radwaste processing equipment*

This combined license (COL) item is addressed in Subsection 11.2.1.6.

CP COL 11.2(2) ***11.2(2)*** *Site-specific information of the LWMS*

This COL item is addressed in Subsections 11.2.2 and 11.2.3.1.

CP COL 11.2(3) ***11.2(3)*** *The liquid containing tank failure*

This COL item is addressed in Subsection 11.2.3.2.

CP COL 11.2(4) ***11.2(4)*** *The site-specific dose calculation*

This COL item is addressed in Subsection 11.2.3.1, Table 11.2-10R, Table 11.2-11R, Table 11.2-12R, Table 11.2-13R, Table 11.2-14R and Table 11.2-15R.

CP COL 11.2(5) ***11.2(5)*** *Site-specific cost benefit analysis*

This COL item is addressed in Subsection 11.2.1.5.

CP COL 11.2(6) ***11.2(6)*** *Piping and instrumentation diagrams*

This COL item is addressed in Subsection 11.2.2 and Figure 11.2-201.

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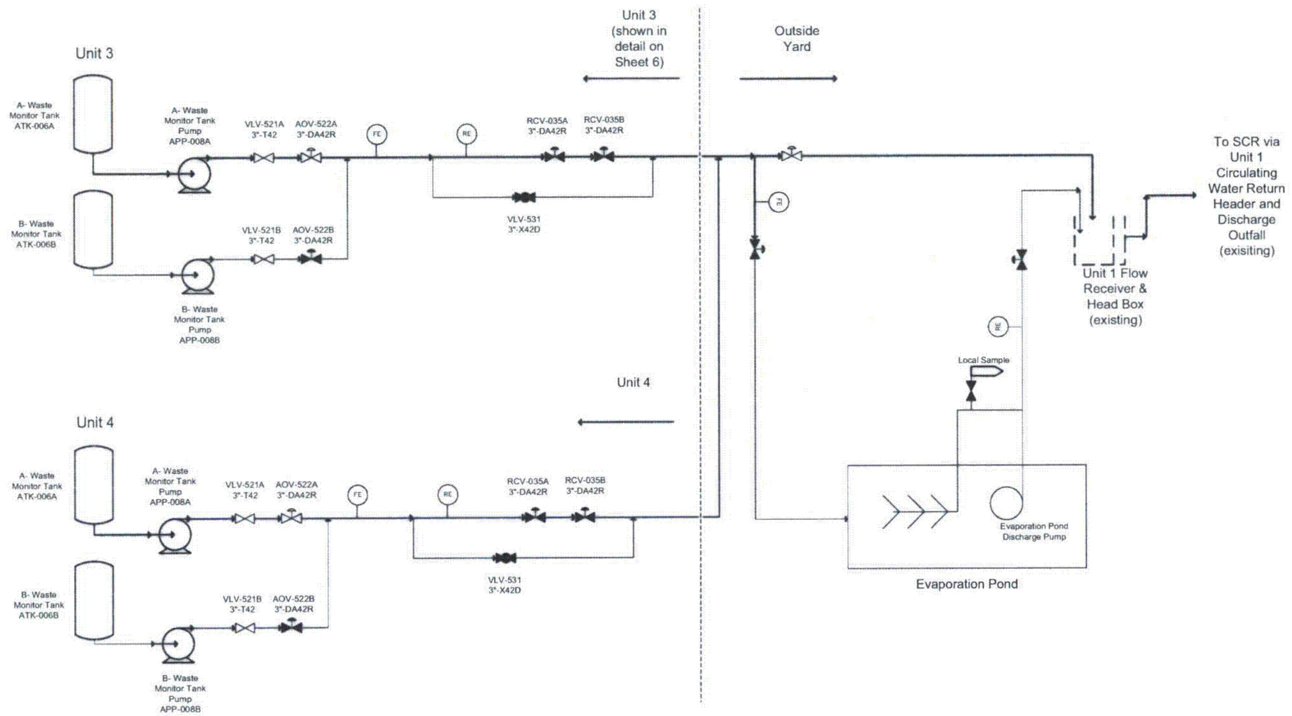

CP COL 11.2(6)

Figure 11.2-201 Liquid Waste Management System Piping and Instrumentation Diagram (Sheet 9 of 10)