PMComanchePeakPEm Resource

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Sent: Thursday, May 20, 2010 8:29 AM
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Cc: ComanchePeakCOL Resource; Reyes, Ruth
Subject: Comanche Peak RCOL Chapter 19 - RAI Number 165
Attachments: RAI 4619 (RAI 165).docx

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 **36** calendar days of May 19, 2010.

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

Hearing Identifier: ComanchePeak_COL_Public
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Request for Additional Information (RAI) No. 4619 COLA Revision 1

RAI Number 165

5/19/2010

Comanche Peak Units 3 and 4
Luminant Generation Company, LLC.
Docket No. 52-034 and 52-035
SRP Section: 19 - Probabilistic Risk Assessment and Severe Accident Evaluation
Application Section: 19.1

QUESTIONS for PRA and Severe Accidents Branch (SPRA)

19-9

The NRC staff needs the following additional information or clarification related to your response to RAI Question 19-1 (RAI Number 26), dated September 22, 2009:

(1) Include in the Combined License (COL) FSAR a brief discussion of the rationale provided in the response for not considering other initiating events beyond loss of offsite power (LOOP) or combined effects.

(2) The modified Table 19.1-203, included in your September 22, 2009 RAI response, shows three scenarios while the discussion of this table on page 19.1-7 of the COL FSAR states that “tornado induced accident scenarios were categorized into four scenarios." Please clarify.

(3) The scenario “loss of offsite power (LOOP) with loss of alternate component cooling water (CCW) induced by tornadoes of enhanced F-scale intensity F1 and F2” has been added in the revised Table 19.1-203. This scenario should be also discussed on page 19.1-7 of the COL FSAR where the other two dominant tornado scenarios are discussed.

(4) A description of the scenario “tornado strike induced loss of offsite power (LOOP) and turbine building (T/B) damage combined with failure of four emergency gas turbine generators” is provided on page 19.1-7 of the COL FSAR. This description should be revised to include the enhanced F-scale intensity range of a tornado strike that would induce the described scenario.

(5) The third scenario listed in the revised Table 19.1-203 of the COL FSAR appears to associate the enhanced F-scale intensity F5 range with wind speeds above 230 mph. This information is in conflict with information provided in Table 19.1-201 of the FSAR where the enhanced F-scale intensity F5 range is shown as associated with wind speeds between 200 mph and 230 mph. Please clarify.

19-10

Please provide the following additional information or clarification related to your response to RAI Question 19-2 (RAI Number 26), dated September 22, 2009:

(1) The following statement is made in the response: "For Comanche Peak Units 3 and 4, a value of 1E-7 for the annual frequency of occurrence is used as a more conservative quantitative screening criterion. If the criterion of $1x10^{-6}$ per year CDF were used, the results would be a lower risk to plant when compared to using the $1x10^{-7}$ annual frequency of occurrence criterion." Please clarify why the criterion of $1x10^{-6}$ per year CDF results in a lower risk to the plant than the $1x10^{-7}$ annual frequency of occurrence criterion.

(2) It is stated in the response that a qualitative screening of external events has been performed, in accordance with the five qualitative criteria provided in ANSI/ANS-58.21-2007 supporting technical requirement EXT-B1, and a quantitative screening of those external events that could not be eliminated by the qualitative screening was performed. However, the staff believes that the underlying rationale of the ANSI/ANS-58.21-2007 qualitative criteria (which apply mainly to operating reactors) need to be examined when these criteria are applied to new reactor designs. An external event "with equal or less damage potential than a design basis event" can be a significant contributor to the core damage frequency (CDF) of a new reactor because of the features of new light water reactors designs which contribute to the lower risk of such reactors from internal events as compared to operating reactors. For example, while an external event that contributes just below $1x10^{-6}$ per year to the CDF of an operating reactor can be screened out from the quantitative analysis, this may not be the case for a new reactor where the CDF from all other sources can be the same order of magnitude or even smaller. Therefore, the five qualitative criteria provided in ANSI/ANS-58.21-2007 should be complemented by appropriate qualitative or quantitative arguments (e.g., the frequency of the analyzed design basis flooding event is smaller than $1x10^{-7}$ per year, the explosion occurs far from the plant and it is physically impossible to impact it) to show that each eliminated external event is indeed an insignificant contributor to the total CDF of the new reactor. Such qualitative or quantitative arguments can be discussed in Table 19.1-205 of Revision 1 of the COL FSAR where the use of the qualitative screening criteria to eliminate external events from further analysis is documented. For example, justification or clarification is needed for several statements made or conclusions reached in Table 19.1-205 of Revision 1 of the CPNPP Units 3 and 4 COL FSAR, such as the following:

(a) It is stated that the maximum flood elevation at CPNPP Units 3 and 4 is 793.46 ft msl and this elevation provides more than 28 feet of freeboard under the worst potential flood considerations. It is further stated that the maximum flood elevation is the sum of the maximum flood level that results

from a probable maximum precipitation (PMP) on the Squaw Creek watershed (788.9 ft) and the maximum coincident wind waves (4.56 ft). These statements do not provide any indication regarding the magnitude of the frequency of the calculated maximum flood elevation or any information about the assumptions used in the calculation (e.g., it is not clear why the PMP is associated with "the worst potential flood considerations"). Qualitative or quantitative arguments are needed, in conjunction with the evaluation of plant design bases, to show that external flooding is indeed an insignificant contributor to the total CDF (i.e., the frequency of a flooding event that would reach the safety-related plant elevation is less than 10^{-7} per year or its contribution to CDF is a small fraction of the total CDF from all initiating events).

(b) Please clarify the description of probable maximum flood (PMF) in Table 19.1-205 of Revision 1 of the CPNPP Units 3 and 4 COL FSAR. It is stated that the PMF and maximum coincident wind wave activity results in a flood elevation of 809.28 ft msl and the top elevation of the retaining wall is 805 ft msl. What is the location of the flood elevation of 809.28 ft msl and that of the retaining wall? Qualitative or quantitative arguments are needed, in conjunction with the evaluation of plant design bases, to show that the probable maximum flood is indeed an insignificant contributor to the total CDF from all initiating events.

(c) The following statements are made: "There are no surface water impoundments other than small farm ponds that could impact the [Squaw Creek Reservoir] SCR," "Failure of downstream dams, including Squaw Creek Dam, would not affect the CPNPP Units 3 and 4," and "The critical dam failure event is the assumed domino-type failure of the Hubbard Creek Dam, the Morris Sheppard Dam and the De Cordova Bend Dam coincident with the PMF." It is not clear how these statements are used to conclude that "[t]here are no safety-related structures that could be affected by flooding due to dam failures." Please clarify the description of dam failures in Table 19.1-205 of Revision 1 of the CPNPP Units 3 and 4 FSAR. In addition, qualitative or quantitative arguments are needed, in conjunction with the evaluation of plant design bases, to show that a dam failure event is indeed an insignificant contributor to the total CDF from all initiating events.

(d) It is stated that there is no threat from brush or forest fires because "… the nuclear island is situated sufficiently clear of trees and brush. The distance exceeds the minimum fuel modification area requirements of 30 ft, per NFPA-1144." However, brush and forest fires have been known to jump fairly wide "fire lines." In addition, it is conceivable that a large fire burning only 30 feet from the nuclear island on a hot summer day could effectively

raise the local air temperature above the “maximum safety” temperature listed in Table 2.0-1R of the FSAR. Qualitative and/or quantitative arguments are needed, in conjunction with the evaluation of plant design bases, to show that an external fire event is indeed an insignificant contributor to the total CDF from all initiating events. Also, a commitment to assure that requirements assumed in the screening analysis, if any, will be met after the plant is built needs to be established (e.g., NFPA-1144 requirements). Please discuss.

(e) For aircraft hazards it is stated: “The probability of aircraft-related accidents for CPNPP Units 3 and 4 is less than an order of magnitude of 10^{-7} per year for aircraft, airway, and airport information reflected in Subsection 2.2.2.7.” Please clarify this statement and justify the applicability of the ANSI/ANS-58.21-2007 qualitative criterion number 2 (i.e., an aircraft hazards event has a significantly lower frequency and no worse consequences than another event that was analyzed).

(f) For turbine missiles it is stated: “The probability of turbine failure resulting in the ejection of turbine rotor (or internal structure) fragments through the turbine casing, P1, as less than 10-5 per year. The acceptable risk rate P4 = P1xP2xP3 is therefore maintained as less than 10^{-7} per year.” Please clarify this statement, define P2 and P3, and justify the applicability of the ANSI/ANS-58.21-2007 qualitative criteria 2 and 3 to a turbine missile event.