

PMComanchePeakPEm Resource

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Sent: Wednesday, April 06, 2011 6:29 PM
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Subject: Agenda and Discussion point for Call on Comanche Peak COL Section 2.4 Open Items
Attachments: Brief Description of section 2.4 Potential Open Items.docx

Don/John,

The attachment is the list of Section 2.4 open items we plan to discuss during the conference call we have scheduled for sometime next week.

Thanks,

Stephen Monarque
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Brief Description of section 2.4 Potential Open Items.docx		27454

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**Description of Potential Open Items Related to the
Comanche Peak Nuclear Power Plant Combined License Application
Chapter 2 – Section 2.4 Hydrologic Safety Review
Phase 2 – Safety Evaluation Report with Open Items**

Introduction

The NRC staff plans to conduct an audit of Luminant's hydrology analysis in order to resolve a number of open items that were discovered during the staff's Phase 2 review of the Comanche Peak Combined License Application, Section 2.4, "Hydrology." To adequately plan for this audit, the NRC staff has developed a detailed list of potential open Items, which are described below under '*Discussion of Open Items.*'

The NRC staff plans to present these open items to Luminant during a teleconference call scheduled to occur sometime during the week of April 11 - 15, 2011.

Prior to the audit, the NRC staff will send Luminant, a detailed audit plan that describes the information the staff will need to review in order to determine whether the open items, described below, can be successfully resolved. The NRC staff will then issue an audit report after the conclusion of the audit.

Discussion of Open Items

Section 2.4.2

This open item is related to determination of onsite flooding potential from local intense precipitation, which Staff had previously discussed with the Applicant. Staff performed an independent analysis using the design grading plan provided in the FSAR, and the results indicate there is a potential for flooding above the critical flooding elevation. The Applicant needs to describe its onsite drainage plan in enough detail to accurately model the effects of local intense precipitation. The Applicant also needs to provide an analysis of the effects of local intense precipitation to demonstrate that SSCs important to safety will not be impacted as a result of onsite flooding.

Section 2.4.3

The Applicant's response to the questions submitted in various RAIs in 2.4.3 has resulted in substantial revision of the watershed flooding analysis. Staff has some questions that require clarification about the watershed flooding analysis.

Section 2.4.10

Flooding protection requirements depend on results of the flooding analysis. Staff's review of the flooding analysis of sections 2.4.2 and 2.4.3, which is based on Staff's independent analyses, indicates that flood levels may exceed the plant grade elevation. The potential for flooding and implementation of protective measures for SSCs important to safety need to be demonstrated by the Applicant.

Section 2.4.12

The open items in 2.4.12 are results of inadequate responses to Staff's multiple RAIs. The following are the proposed open items in Section 2.4.12.

- The Applicant needs to present a conceptual model of site hydrogeology that is scientifically sound and based on engineering design specifications, is consistent with the available data, and provides a conservative basis for assessing groundwater levels and potential transport pathways.
- The Applicant needs to address outstanding questions related to conservatism and documentation of the selection of an effective porosity and other aquifer parameters used for calculations related to the horizontal transport pathway to the SCR, to the vertical transport pathway through the Glen Rose limestone to the Twin Mountains aquifer, and to calculations of groundwater elevation.
- Staff has identified the need for the Applicant to provide additional information on current and anticipated future groundwater levels to: 1) complete a conservative quantitative analysis that demonstrates that the estimated maximum operational groundwater level complies with the US-APWR Design Certification Document and 2) better identify, understand, and quantify the impact of site modifications on site hydrologic processes such as infiltration, surface runoff, groundwater levels, hydraulic gradients, permeability, and alternative flow paths needed to complete the accidental release evaluation in Section 2.4.13.
- Staff's review still identifies omissions of information about assumptions, as well as apparent arithmetic errors, in the travel time calculations. One such example is the apparent error in the calculation of travel times in Table 2.4.211, in which the Applicant uses the less conservative Pathway 1 travel time while assuming that it is the most conservative. The Applicant needs to correct apparent errors in the travel time calculations summarized in FSAR Table 2.4.211 to ensure that all of its assumptions and calculations are documented, and to ensure that the most conservative assumptions regarding travel times are used in subsequent calculations.
- The Applicant has not conducted a site-specific evaluation of the vertical transport pathway through the Glen Rose to potential groundwater receptors in the Twin

Mountains Formation. Site-specific porosity measurements, distances from the tanks to the Twin Mountains Formation, and tank source terms are different for Units 3 and 4 compared to those used in the Units 1 and 2 evaluation. The Applicant needs to conduct site-specific conceptualizations and calculations of the vertical transport pathway through the Glen Rose Formation to the Twin Mountains Formation for Units 3 and 4.

- The Applicant needs to conduct a conservative quantitative analysis using site-specific engineering design specifications that demonstrates that the estimated maximum operational groundwater level complies with the US-APWR Design Certification Document under all potential site hydrogeologic conditions, including earthquakes.

Section 2.4.13

The open items in 2.4.13 are results of inadequate responses to Staff's multiple RAIs. The following are the proposed open items in Section 2.4.13.

- The Applicant has made many generalized, simplistic, and unsupported assumptions in the analysis of the vertical migration pathway to the Twin Mountains Formation, and regarding the horizontal flow path to the SCR and the subsequent transport and dilution that would occur in the SCR. The Applicant's calculations, rationale, and assumptions are very difficult to follow. The Applicant needs to present an analysis that considers multiple conceptual models for transport and exposure that are based on site-specific conditions.
- Staff had requested the Applicant perform an analysis to determine the impact of vertical migration of an accidental effluent release from Units 3 and 4 to the nearest offsite groundwater receptor within the Twin Mountains Formation. This analysis needs to be based on the improved conceptualization described above, and to use conservative estimates or measurements of groundwater levels, hydraulic conductivity, effective porosity, flow directions and other hydraulic parameters. The conclusions in the Applicants' existing responses regarding this pathway still rely on the evaluations conducted for Units 1 and 2. Staff has reason to believe that this approach does not provide a conservative analysis for Units 3 and 4, and Staff has determined that the information provided by the Applicant is inadequate to conduct confirmatory analysis. Staff conducted independent calculations to further assess the viability of the vertical pathway to the Twin Mountains Formation by modeling an accidental release from the Boric Acid Tank, using volumes and concentrations of selected radioisotopes (H-3, Cs-134, Cs-137, Co-60 and Sr-90) provided by the Applicant. Contaminant decay, advection and dispersion were modeled, and the results indicate that the effluent concentration limits could be exceeded for all isotopes considered. Although additional transport of radioisotopes would be required to reach an offsite groundwater receptor, this independent calculation indicates that vertical transport to the Twin Mountains formation represents a viable pathway that the Applicant needs to consider more fully in its analysis.

- The basis for the Applicant's estimates of the rate of contaminant delivery to SCR is neither adequately explained nor justified. Additionally, the Staff found arithmetic errors in the Applicant's calculations of the groundwater travel time from the Unit 4 tank release site to SCR that would significantly reduce the calculated travel time for pathway 2. The Applicant, however, used the less conservative groundwater travel time calculated for pathway 1 for all of its calculations. Staff's independent calculations indicate that, if site-specific modeling is conducted with conservative input parameters, there is potential for ECLs to be exceeded for the lateral transport scenario through the fill to the SCR with subsequent transport in surface water to the Roto-cone. The Applicant needs to conduct a more rigorous analysis of the lateral transport scenario that is based on site-specific conditions that include alternative, more rapid transport pathways (e.g., Pathway 2, or to the storm water storage basins, or through subsurface drains), and that uses bounding or conservative assumptions and input parameters for groundwater and surface water transport and attenuation.