PMComanchePeakPEm Resource

From: Monarque, Stephen
Sent: Sunday, February 21, 2010 1:40 PM
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Cc: ComanchePeakCOL Resource; Magee, Michael
Subject: Comanche Peak RCOL Chapter 2.4.4 - RAI Number 140
Attachments: RAI 4311 (RAI 140).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 or public meeting is needed.

The response to this RAI is due within 36 calendar days of February 21, 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
Email Number: 829

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Request for Additional Information (RAI) No. 4311 COL Revision 1

RAI Number 140

2/21/2010

Comanche Peak Units 3 and 4
Luminant Generation Company, LLC.
Docket No. 52-034 and 52-035
SRP Section: 02.04.04 - Potential Dam Failures
Application Section: FSAR Section 2.4.4

QUESTIONS for Hydrologic Engineering Branch (RHEB)

02.04.04-5

NUREG-0800, Standard Review Plan (SRP), Section 2.4.4, 'Potential Dam Failures,' establishes criteria that Staff intends to use to evaluate whether an Applicant meets the NRC's regulations.

By letter dated October 2, 2009, the NRC staff issued RAI ID 3666 (RAI No. 111) Question Number 14250 (02.04.04-1), in which the NRC staff asked "Provide a description of the process used to determine that the multiple dam failure analysis and resulting flood elevations are based on the most conservative of all plausible conceptual models, including consideration of multiple scenarios of domino failures of existing and proposed dam development within the Brazos River Basin and coincident wind and wave activity on each failed dam."

The applicant responded in document CP-200901564-Log No TXNB-09067 (ML093230704) executed on November 13, 2009. The NRC staff has reviewed the response, including the cited changes reflected in Updated Tracking Report No. 4, FSAR.

The NRC staff refers to the portion of the applicant's response that reads "Because the site is located off-channel on a tributary of the Brazos River, the most conservative approach for the critical dam failure event would be for this reach of the Brazos River to flood by way of domino-type dam failure of upstream dams, and for flood waters to back-up from the Brazos River and Paluxy River confluence onto the site by way of the Squaw Creek catchment." The applicant has provided much of the necessary information about how the applicant identified a bounding conservative approach to the dam break problem.

In order to make its safety determination based on the use of appropriate quantitative and technical analyses, the NRC staff requests that the applicant provide clear justification for the assertion of bounding conservatism of the resulting flood elevation at the proposed Comanche Peak Nuclear Power Plant, Units 3 and 4 site by providing a physical basis and hydraulic basis for including or excluding each existing or proposed dam and reservoir from the domino dam failure analysis presented in the FSAR.

This is supplemental RAI 2.4.4-00-S-a.

02.04.04-6

NUREG-0800, Standard Review Plan (SRP), Section 2.4.4, ‘Potential Dam Failures,' establishes criteria that NRC staff intends to use to evaluate whether an applicant meets the NRC's regulations.

The NRC staff issued RAI ID 3666 (RAI No. 111) Question Number 14250 (02.04.04-1), in which the NRC staff asked “Provide a description of the process used to determine that the multiple dam failure analysis and resulting flood elevations are based on the most conservative of all plausible conceptual models, including consideration of multiple scenarios of domino failures of existing and proposed dam development within the Brazos River Basin and coincident wind and wave activity on each failed dam.”

The applicant responded in document CP-200901564-Log No TXNB-09067-ML093230704 executed on November 13, 2009. The NRC staff has reviewed the response, including the cited changes reflected in FSAR Updated Tracking Report No. 4.

The NRC staff disagrees with the last portion of the applicant’s response that states “The total dam failure flow is the sum of the spillway flow, the breach flow, the remainder of the overtopping flow not affected by the breach width combined with the coincident PMF flow for the respective dams. The dam failure flows represent the dam storage for the respective dams. The coincident wind wave activity on each failed upstream dam will be limited to an instantaneous wave height and will not increase the dam failure flows. Hence, coincident wind wave activity on each of the failed upstream dam was considered not applicable for the dam failures.”

The NRC staff notes that wind setup on a reservoir is not an instantaneous phenomenon. Rather it can be a persistent mechanism for increasing the energy head on a dam about to fail. The equations used by the applicant to compute dam break flows in FSAR Section 2.4.4.1 do exhibit dependence on energy head at the time of failure. The NRC staff concludes that wind setup on a reservoir would increase dam break flows in the applicant’s dam break scenario.

In order to make its safety determination based on adequate consideration of appropriate mechanisms that result in a conservative estimate, the NRC staff requests that the applicant add wind setup computations for all reservoirs included in the dam break analysis.

This is supplemental RAI 2.4.4-00-S-b.

02.04.04-7

NUREG-0800, Standard Review Plan (SRP), Section 2.4.4, ‘Potential Dam Failures,' establishes criteria that Staff intends to use to evaluate whether an applicant meets the NRC's regulations.

The NRC staff issued RAI ID 3666 (RAI No. 111) Question Number 14253 (02.04.04-4), in which the NRC staff asked “Provide a rationale for assuming normal water surface elevations for reservoirs included in the domino-type dam failure scenario. Explain why the analysis should not include maximum reservoir elevations as reported in operating histories or in reservoir operating guides maintained by operating authorities.”

The applicant responded in document CP-200901564-Log No TXNB-09067-(ML093230704) executed on November 13, 2009. Staff has reviewed the response, including the cited changes reflected in FSAR Updated Tracking Report No 4.

The applicant’s response states that “reservoirs are assumed to be at normal water surface elevation for antecedent conditions at the onset of the PMF” and that “the peak water surface elevation for the corresponding dam failure is equal to the height of the dam plus the height of the overtopping flows, which will exceed the maximum reservoir elevation and hence, was considered to be conservative.” This response does not address the dependence of breach and overtopping flows on initial height (reservoir elevation), nor does it address the increased volume impounded by the reservoir at maximum storage, which would worsen downstream flooding.

In order to make its safety determination based on the use of appropriate quantitative and technical analyses, the NRC staff requests that the applicant provide justifications based on the hydraulic equations cited in Section 2.4.4.1 of the FSAR, that the assumption of normal water surface elevation for failed reservoirs is as conservative as an assumption of reservoirs at maximum elevation. Otherwise, the applicant should revise the analysis to model reservoirs at maximum water surface elevation prior to failure.

This is supplemental RAI 2.4.4-03-S.