Callaway2COLPEm Resource

From: Arora, Surinder
Sent: Wednesday, June 10, 2009 1:12 PM
To: Shafer, David E
Cc: Callaway2COL Resource; Colaccino, Joseph; Hodgdon, Ann; Phan, Hanh; Mrowca, Lynn; Chowdhury, Prosanta; NPUnit2-EPR@ameren.com
Subject: FW: Final RAI N0. 19 (eRAI 2662) - Public
Attachments: FINAL RAI 2662.doc

Dave,

Attached please find the subject request for additional information (RAI). A draft of this RAI was provided to you on May 18, 2009. Based on your request, a clarification telecon was held on June 1, 2009 to discuss this RAI. No changes were made to the original questions.

The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a schedule date for submitting your technically correct and complete response will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the review schedule.

Your response letter should also include a statement confirming that the response does or does not contain any sensitive or proprietary information.

Thanks.

SURINDER ARORA, PE
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6/10/2009

Callaway Unit 2
AmerenUE
Docket No. 52-037
SRP Section: 19 - Probabilistic Risk Assessment and Severe Accident Evaluation
Application Section: 19.1.5

QUESTIONS for PRA Licensing, Operations Support and Maintenance Branch 1 (AP1000/EPR Projects) (SPLA)

19-9

Callaway Plant Unit 2 FSAR Section 19.1.2.4.1, Page 19-6, Item 1, states that "If the cumulative effect of pending changes is judged to either increase CDF to 1.0E-06 per year or greater, or increase LRF to 1.0E-07 per year or greater, then a PRA model revision will be made in a timely manner, regardless of the next routine update-cycle schedule."

As mentioned in the ASME RA-Sc 2007 PRA Standard, "The PRA shall be maintained and upgraded, such that its representation of the as-built, as-operated plant is sufficient to support the applications for which it is being used." The probabilistic risk assessment (PRA) should be updated as frequently as necessary to ensure that the PRA remains an accurate representation of the plant risk. Thus, it would not be a good practice to accumulate a backlog of pending changes such that the effect is estimated to increase the CDF to 1.0E-6/yr, which is nearly twice that of the estimated baseline EPR CDF, and/or to increase the LRF to 1.0E-7/yr, which is almost 4 times greater than the baseline EPR LRF.

Please justify setting the targeted cumulative effect to 1E-6/yr CDF and 1E-7/yr LRF, and make appropriate changes to the Callaway Plant Unit 2 FSAR.

19-10

The risks posed by external events should be assessed from a probabilistic risk assessment (PRA) perspective and should be screened against the SRP Chapter 19 screening criteria. The Regulatory Guide 1.200 Revision 2, dated March 2009, Table 2 on Page 10 states that "It is recognized that for those new reactor designs with substantially lower risk profiles (e.g., internal events CDF below 1E-6/yr) that the quantitative screening value should be adjusted according to the corresponding baseline risk value."

With the baseline U.S. EPR internal events core damage frequency (CDF) and large release frequency (LRF) known to be 5E-7/yr and 3E-8/yr, it is not practical to screen out the external events using the quantitative screening criteria that are higher than the baseline risk values. Furthermore, the staff notes that the ANSI/ANS-58.21-2007 allows external hazard screening; however, the screening criteria described therein are for the current generation of operating plants. The COL application should consider the relative value of what is screened out versus the baseline risk values of the EPR design.

Thus, please reassess the external events using an appropriate PRA screening value, or justify an alternative from a PRA perspective.

19-11

Callaway Plant Unit 2 FSAR Section 19.1.5.2 states that “The flooding frequency from site-specific systems such as the Circulating Water System, the Closed Cooling Water System and the Auxiliary Cooling Water System was not derived using design information. Instead the U.S. EPR FSAR internal flooding frequency for the turbine building is based on a conservative generic frequency, which is judged to include contributions from all these site-specific systems. Therefore the U.S. EPR FSAR internal flooding PRA is applicable for Callaway Plant Unit 2.”

Please provide justification that the U.S. EPR FSAR flooding frequency for turbine building conservatively remains bounding for Callaway Plant Unit 2 turbine building flooding.

19-12

With regard to the high winds and tornado quantitative evaluation provided in the Callaway Plant Unit 2 FSAR Section 19.1.5.4.1, it was mentioned that the Callaway Plant Unit 2 FSAR Level 1 PRA Loss of Offsite Power event tree model is used to evaluate the conditional core damage probability. Please explicitly describe the treatment of offsite and onsite power recovery.

19-13

The quantitative discussion of airplane crash assessment in Section 19.1.5.4.4 is not detailed enough for the staff to conclude that the aircraft crash can be screened from the probabilistic risk assessment. Please provide additional details including the crash frequency, conditional core damage probability, dominant sequences/cutsets, and key assumptions associated with the calculated core damage frequency of 9.9E-8/yr of airplane crash into the Callaway Plant Unit 2. Additionally, provide the large release frequency associated with the airplane crash scenario and its rationale.

19-14

In the discussion in Section 19.1.5.4.5 “Highway Hazards” it is not clear whether a quantitative risk assessment was used to screen out the hazards or not. Please clarify and provide the rationale.

19-15

Section 19.1.5.4.5 “Nearby Facilities Hazards” states that “In each case, either the largest minimum separation distance is found to be less than the actual distance, or a quantitative risk assessment was used to show that the rate of exposure to a peak positive incident overpressure in excess of 1 psi was less than 1E-07 per year when based on realistic assumptions.” Please explicitly identify the approach(es) used for screening out the hazards and also provide the rationale.

19-16

Table 19.1-1, the basis for screening “High Summer Temperature” hazard is not clear. Please verify that all safety-related components and other components modeled in the PRA including HVAC systems are designed to withstand the maximum air temperature during summer. Additionally, revise Table 19.1-1 to clearly document the rationale.

19-17

Table 19.1-1, the basis for screening “Low Winter Temperature” hazard is not clear. Please verify that all safety-related components and other components modeled in the PRA including HVAC systems are designed to withstand the minimum air temperature during winter. Additionally, revise Table 19.1-1 to clearly document the rationale.

19-18

FSAR Section 19.1.5.1.2.4 states that “The Callaway Plant Unit 2 GMRS is above the envelope of the EUR ground motions for frequencies below 0.37 Hz and above 10 Hz. In the vertical direction, the Callaway Plant Unit 2 final GMRS exceeds the EUR design envelope for frequencies above 14.8 Hz and below 0.25 Hz. The horizontal and vertical GMRS have peak ground acceleration (PGA) values of 0.23 g and 0.25 g, respectively.”

Please describe in detail how the ground motion response spectra (GMRS) exceedances would have insignificant impact on the Callaway Plant Unit 2 seismic margins assessment.