NRR-PMDAPEm Resource

From:	Hall, Victor
Sent:	Wednesday, March 04, 2015 4:42 PM
То:	Callis, Steve (Steve.Callis@duke-energy.com); Hubbard, Dean M (Dean.Hubbard@duke-
	energy.com)
Cc:	Whaley, Sheena
Subject:	Request for Additional Information - H.B. Robinson 2.1 Flood Hazard Reevaluation Report
Attachments:	HBRobinson FHRR RAIs - Rev1.docx

Mr. Hubbard,

By letter dated March 12, 2014, Duke Energy (the licensee) submitted its flood hazard reevaluation report (FHRR) for H. B. Robinson Steam Electric Plant, Unit No. 2 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14086A384). By letter dated June 18, 2014, the U.S. Nuclear Regulatory Commission (NRC) staff provided a request for additional information (RAI) regarding the above referenced FHRR (ADAMS Accession No. ML14168A050). The licensee responded to this RAI by letter dated July 9, 2014. Based on a review of the submittal and additional information provided, the NRC staff has determined that the attached RAI is required in order to complete its review.

As we discussed in our clarification calls, the NRC staff requests that Duke provide a response, or a schedule to provide a response, within 90 days (June 2, 2015) of this email. The NRC staff has determined that no security-related or proprietary information is contained herein.

Sincerely,

Victor Hall Senior Project Manager Japan Lessons Learned Division Office of Nuclear Reactor Regulation 301-415-2915

Hearing Identifier:	NRR_PMDA
Email Number:	1922

Mail Envelope Properties (Victor.Hall@nrc.gov20150304164100)

Subject: Reevaluation Report	Request for Additional Information - H.B. Robinson 2.1 Flood Hazard
Sent Date:	3/4/2015 4:41:49 PM
From:	Hall, Victor

Created By: Victor.Hall@nrc.gov

Recipients:

"Whaley, Sheena" <Sheena.Whaley@nrc.gov> Tracking Status: None "Callis, Steve (Steve.Callis@duke-energy.com)" <Steve.Callis@duke-energy.com> Tracking Status: None "Hubbard, Dean M (Dean.Hubbard@duke-energy.com)" <Dean.Hubbard@duke-energy.com> Tracking Status: None

Post Office:

Return Notification:

Reply Requested:

Expiration Date: Recipients Received:

Sensitivity:

Files	Size	Date & Time
MESSAGE	1164	3/4/2015 4:41:00 PM
HBRobinson FHRR RAIs - Rev1.docx		41167
Options		
Priority:	Standard	

No

No

Normal

Request for Additional Information Fukushima Lessons Learned Flood Hazard Reevaluation Report H. B. Robinson Steam Electric Plant, Unit No. 2 (TAC No. MF3586)

By letter dated March 12, 2014, Duke Energy (the licensee) submitted its flood hazard reevaluation report (FHRR) for H. B. Robinson Steam Electric Plant, Unit No. 2 (Agencywide Documents Access and Management System (ADAMS) Accession No.ML14086A384). By letter dated June 18, 2014, the U.S. Nuclear Regulatory Commission (NRC) staff provided a request for additional information (RAI) regarding the above referenced FHRR (ADAMS Accession No. ML14168A050). The licensee responded to this RAI by letter dated July 9, 2014. The staff determined that additional information, as requested below, was necessary to complete its assessment of the licensee's FHRR.

RAI 1: Local Intense Precipitation (LIP) Event Duration and Distribution

The flood hazard reevaluation report (FHRR) presents a LIP flood reevaluation for a 6-hour, front-loaded probable maximum precipitation (PMP) event using Hydrometeorological Report Nos. 51 and 52. Provide justification that the LIP analysis presented in the FHRR is bounding in terms of warning time, flood depth, and flood duration. This justification can includesensitivity analysis of LIP event duration to consider localized (one square mile) PMP events up to 72 hours in duration (e.g., 1-, 12-, 24-, 48-, 72-hour PMPs)and various rainfall distributions (e.g., center-loaded and others in addition to a front-loaded distribution). The evaluations could identify potentially bounding scenarios with respect to flood height, event duration, and associated effects. Provide electronic versions of any associated modeling input and output files for the sensitivity runs.

RAI 2: LIP Runoff from Buildings

The FHRR does not describe how precipitation onto building roofs was modeled. The licensee's FLO-2D input files appear to indicate that the rainfall on the model grid elements representing building blocksis missing or not being conveyed to the site ground resulting in the potential to underestimate the LIP flood hazards.Clarify or reanalyze how rain that falls onto buildings is accounted for in the LIP analysis and how the LIP modeling properly accounts for this rainfall.

RAI 3: PMF in Streams and Rivers

The HEC-HMS model simulates five PMF scenarios(Scenarios A through D and "Final") under a hierarchical approach. Table 7 of the PMF calculation package, 30958-138-12-05-200-002 summarizes the results. The simulated basin outflow, which is called the "Inflow Volume" to the HEC-RAS model on Table 7, for the Final Scenario is smaller (approximately 12 inches in depth lower) than those listed for Scenarios B, C, and D. The reason for this smaller volume appears to be because the Final Scenario used a large initial abstraction value (4.02 inches) along with other unknown (undocumented in the calculation package) losses, whileScenarios B, C, and D included no losses. Provide a description ofhow the HEC-HMS model handles the initial abstraction along with other undocumented losses for each scenario. Justify why the estimated flood peak for the Final Scenario is significantly lower than those for Scenarios B through D.Also provide a justification ofwhythe Final Scenario is appropriate for simulating the 72-hour PMF on the river basin.Provide electronic versions of any associated modeling input and output files for the runs.

RAI 4: PMF and Combined Effects Dam Failure Assumption

Section 3.9.1.1 (Floods Caused By Precipitation Events) states: "The maximum wave runup elevation resulting from the PMF (w/ breach) with 2-year wind speed is 233.21 ft NGVD29 at Lake Robinson. This elevation is higher than theHBRSEP site grade of 225 ft NGVD29. A higher elevation could result should the damremain intact. However, the dam is expected to fail." Failure of the downstream damcould result in aless severe flood hazard compared to that without downstream dam failure. Therefore, explainwhy no downstream dam failure effectsas well as all applicable associated effects (e.g., wind, debris, erosion and sedimentation, ice, etc.) were not considered or found to be not applicable to the evaluation of dam failure flooding. Provide electronic versions of any associated modeling input and output files for the additional runs.

RAI 5: Hazard Input for the Integrated Assessment - Flood Event Duration Parameters

Clarify which flood hazard mechanisms and their combined and associated events, if applicable, will be included in the Integrated Assessment. Provide the applicable flood event duration parameters associated with mechanisms that trigger an integrated assessment using the results of the flood hazard reevaluation (see definition and Figure 6 of the NRC interim staff guidance document JLD-ISG-2012-05, "Guidance for Performing an Integrated Assessment," dated November 2012 (ADAMS Accession No. ML 2311A214)). This should include the warning time the site will have to prepare for the event (e.g., the time between notification of an impending flood event and arrival of floodwaters on site) and the period of time the site is inundated for the mechanisms that are not bounded by the current design basis. Also, provide the basis or source of information for the flood event duration, which may include a description of relevant forecasting methods (e.g., products from local, regional, or national weather forecasting centers) and/or timing information derived from the hazard analysis.

RAI 6: Hazard Input for the Integrated Assessment - Flood Height and Associated Effects

FHRR does not clearly describe associated effects of the selected flood scenarios that are proposed to be considered in the integrated assessment.Provide the flood height and associated effects (as defined in Section 9 of JLD-ISG-2012-05) that are not described in the flood hazard reevaluation report for mechanisms that trigger an integrated assessment. This includes the following quantified information for each mechanism (as applicable):

- Hydrodynamic loading, including debris;
- Effects caused by sediment deposition and erosion (e.g., flow velocities, scour);
- Concurrent site conditions, including adverse weather; and
- Groundwater ingress.

RAI 7: Comparison of Reevaluated Flood Hazard with Current Design Basis

The FHRR for H.B. Robinson Steam Electric Plant, Unit No. 2 provides a comparison of the reevaluated flood hazards with the current licensing basis (CLB).Provide clarification for the inconsistencies identified in the FHRR with regard to the comparison of the reevaluated flood hazard to the current design basis and submit a revised hazard comparison consistent with the instructions provided in the 50.54(f) letter.