NRR-PMDAPEm Resource

From: Klos, John
Sent: Wednesday, May 31, 2017 7:10 AM
To: Williams, Lisa L.; Christianson, Sandra J.
Cc: Klos, John
Subject: Columbia LAR extend RHR outage time 7 to 14 days, MF8794, formal release of RAIs

Importance: High

Lisa,

By letter dated November 8, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16313A573), Energy Northwest (the licensee) submitted a License Amendment Request (LAR) for Columbia Generating Station, which proposed a one-time extension of increasing the Completion Time (CT) currently specified in Technical Specification (TS) conditions 3.5.1.A, 3.6.1.5.A, and 3.6.2.3.A from 7 days to 14 days for restoring Residual Heat Removal (RHR) Train A. The extended CT will allow sufficient time to complete the preventive maintenance to install a new pump and motor in the RHR Train A subsystem, which is planned for December 2017.

The Probabilistic Risk Assessment Licensing Branch (APLA) has reviewed the LAR and has identified areas where additional information is needed to complete its review. The Request for Additional Information (RAI) is provided as an enclosure to this memorandum.

A clarification call was held on May 25th that developed the final set of questions below which require no further clarification, per your staff.
Based on discussions held during the May 25th call these RAIs are released formally with a 45 calendar day response time; thereby, these RAIs are due July 15, 2017.

APLA RAI 01

The license amendment request (LAR) for Columbia Generating Station (CGS), dated November 8, 2016, states that the proposed change to the Technical Specification (TS) completion time has been evaluated using the risk-informed processes described in Regulatory Guide (RG) 1.177, “An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications,” Revision 1. Based on Section 2.3.1 of RG 1.177, the technical adequacy of the probabilistic risk assessment (PRA) must be compatible with the safety implications of the Technical Specification change being requested and the role that the PRA plays in justifying that change. RG 1.177 endorses the guidance provided in RG 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities,” Revision 2, on PRA technical adequacy. RG 1.200 describes a peer review process utilizing American Society of Mechanical Engineers/American Nuclear Society (ASME/ANS) PRA standard RA-Sa-2009, "Addenda to ASME/ANS RA-S-2008 Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications," as one acceptable approach for determining the technical adequacy of the PRA once acceptable consensus approaches or models have been established for evaluations that could influence the regulatory decision.

Based on Section 5.1 of LAR Attachment 5, the CGS internal events probabilistic risk assessment (IEPRA) underwent a peer review against ASME/ANS RA-Sa-2009, as clarified/qualified by Revision 2 of RG 1.200. The peer review was conducted using the industry peer review process guidelines in NEI 05-04, Revision 2, “Process for Performing Internal Events PRA Peer Reviews Using the ASME/ANS PRA Standard.” Section 4.6 of NEI 05-04 states:

“It should be noted that even in cases where an SR [supporting requirement] has been assessed to meet CC [Capability Category] II or III, the review team may document an F&O [facts and observations] finding. Such findings are typically for non-systematic discrepancies that the PRA peer review team judges require correction.”

LAR Attachment 6 provides and dispositions finding-level F&Os associated with SRs that were assessed by this peer review as not meeting CC II. However, no information appears to have been provided regarding finding-level F&Os associated with SRs that were otherwise met at CC II. Owing to their potential impact to the risk results of the proposed one-time completion time (CT) extension, provide all remaining finding-level F&Os from the 2009 peer review and associated dispositions. Additionally, clarify whether any changes made to the IEPRA subsequent to the peer review constitute a PRA upgrade as defined by ASME/ANS RA-Sa-2009. For those changes that constitute a PRA upgrade, if any, indicate whether a focused-scope peer review(s) has been performed for those upgrades. As applicable, provide the finding-level F&Os from the peer review(s) and explain how the F&Os were dispositioned for this application. If a focused-scope peer review(s) was not performed for these upgrades, then provide a qualitative or quantitative evaluation (e.g., sensitivity or bounding analysis) of its effect on the risk assessment results.

APLA RAI 02

The CGS LAR states that the proposed change to the TS completion time has been evaluated using the risk-informed processes described in RG 1.177, Revision 1. Based on Section 2.3.1 of RG 1.177, the technical adequacy of the PRA must be compatible with the safety implications of the Technical Specification change being requested and the role that the PRA plays in justifying that change. RG 1.177 endorses the guidance provided in RG 1.200, Revision 2, on PRA technical adequacy. RG 1.200 describes a peer review process utilizing ASME/ANS RA-Sa-2009 as one acceptable approach for determining the technical adequacy of the PRA once acceptable consensus approaches or models have been established for evaluations that could influence the regulatory decision.

In Section 5.2 of LAR Attachment 5, the licensee explains that the fire PRA (FPRA) has not undergone a peer review against ASME/ANS RA-Sa-2009, as clarified/qualified by Revision 2 of RG 1.200. Additionally, the licensee further clarifies that if such a review were to be performed, the FPRA would not meet all supporting requirements of ASME/ANS RA-Sa-2009 at a level of CC II, which the NRC staff, in general, anticipates is adequate for the majority of applications. Lastly, although some of the FPRA’s methods were updated in 2006 to make use of guidance in NUREG/CR-6850, the methodologies of the FPRA appear to still be largely based on the Individual Plant Examination of External Events (IPEEE) model, and there have been significant changes to FPRA methodology since the IPEEE model was issued in 2001.

Identify any gaps between the CGS FPRA model and the "Internal Fire Technical Elements" required by Revision 2 of RG 1.200 that are relevant to this submittal. In doing so, explain why these gaps do not have significant impact on the risk assessment results and the development of compensatory actions used to support this application. This may include discussion of relevant conservatisms in the CGS FPRA model and additional sources of defense-in-depth, as well as, the risk significance of each to the application.

APLA RAI 03

The CGS LAR states that the proposed change to the TS completion time has been evaluated using the risk-informed processes described in RG 1.177, Revision 1. Based on Section 2.3.1 of RG 1.177, the technical adequacy of the PRA must be compatible with the safety implications of the Technical Specification change being requested and the role that the PRA plays in justifying that change. RG 1.177 endorses the guidance provided in RG 1.200, Revision 2, on PRA technical adequacy. RG 1.200 describes a peer review process utilizing ASME/ANS RA-Sa-2009 as one acceptable approach for determining the technical adequacy of the PRA once acceptable consensus approaches or models have been established for evaluations that could influence the regulatory decision.

In Section 5.3 of LAR Attachment 5, the licensee explains that the seismic PRA (SPRA) has not undergone a peer review against the ASME/ANS PRA standard RA-Sa-2009, as clarified/qualified by Revision 2 of RG 1.200. Additionally, while the licensee indicates that seismic hazards are a low risk contributor, the risk results presented in Table 2 of LAR Attachment 1 demonstrate that the incremental conditional core damage probability (ICCDP) contribution from seismic events (approximately 23%) is not much different than that from other hazards (i.e., internal events and fire). Moreover, considering that RHR pumps are stated as having high seismic capacity, it is not clear to the NRC staff that RHR Train A subsystem unavailability is insignificant to seismic risk on the basis of seismic correlation between RHR pumps alone and independent of other structures, subsystems and components, which may have a lesser seismic capacity and may not be correlated across trains. Lastly, the SPRA, which is based upon the IPEEE model, does not appear to address updated seismic hazard information and the significant changes to SPRA methodologies since the IPEEE model was issued in 2001.

Identify any gaps between the CGS SPRA model and the "Seismic Events Technical Elements" required by Revision 2 of RG 1.200 that are relevant to this submittal. In doing so, explain why these gaps do not have significant impact on the risk assessment results and the development of compensatory actions used to support this application. This may include discussion of relevant conservatisms in the CGS SPRA model and additional sources of defense-in-depth, as well as, the risk significance of each to the application.

APLA RAI 04

The CGS LAR states that the proposed change to the TS completion time has been evaluated using the risk-informed processes described in RG 1.177, Revision 1. RG 1.177 states “risk-informed analyses of TS changes can be affected by numerous uncertainties regarding the assumptions made during the PRA model’s development and application.” The LAR neither identifies nor assesses uncertainties associated with the fire and seismic PRAs, and Section 4 of LAR Attachment 5 clarifies that no formal assessment of uncertainties has been performed. Provide, consistent with the guidance in RG 1.177, assurance that uncertainties associated with the fire and seismic PRAs are not sufficient to change the conclusions of the LAR.

APLA RAI 05

The CGS LAR states that the proposed change to the TS completion time has been evaluated using the risk-informed processes described in RG 1.177, Revision 1. Section 2.3 of RG 1.177 states “compensatory actions that can mitigate any corresponding increase in risk … should be identified and evaluated.“

Due to analyses of risk-significant combinations documented in LAR Attachment 5, the licensee committed, in Section 3.6 of LAR Attachment 1 and LAR Attachment 4, to implement flood and fire watch tours as a means of early detection and risk reduction. However, no information by which to evaluate the effectiveness of these compensatory measures (e.g., frequency of tours) appears to have been provided. Clarify how the committed flood and fire watch tours offer appropriate restrictions to reduce risk from the corresponding risk-significant scenarios.

APLA RAI 06

The CGS LAR states that the proposed change to the TS completion time has been evaluated using the risk-informed processes described in RG 1.177, Revision 1. As indicated in Section 2.3.7.2 of RG 1.177, the licensee should ensure that the Configuration Risk Management Program (CRMP) contains a number of key components, including the treatment of external hazards and Level 2 issues, either qualitatively or quantitatively, or both. However, while Section 3.7 of LAR Attachment 1 indicates that the CRMP makes use of quantitative insights provided by the internal events PRA, plant risk levels appear to only address core damage risk. Additionally, while the CRMP addresses fire hazards qualitatively, it does not appear to address other hazards, particularly external hazards such as those posed by seismic events. Clarify how the CRMP proposed in the LAR treats external hazards and Level 2 issues consistent with guidance in RG 1.177.

APLA RAI 07

The CGS LAR states that the proposed change to the TS completion time has been evaluated using the risk-informed processes described in RG 1.177, Revision 1. Section 3.2 of RG 1.177 states "[i]f the licensee concludes that the performance or condition of TS equipment affected by a TS change does not meet established performance criteria [as part of its Maintenance Rule program], appropriate corrective action should be taken, in accordance with the Maintenance Rule." Clarify if the additional out-of-service time for the RHR Train A subsystem is expected to result in exceeding the current established Maintenance Rule performance criteria for the RHR Train A subsystem. If so, describe the corrective action(s) that will be taken.

John Klos
DORL Callaway, Columbia Project Manager
U.S. NRC, Office of Nuclear Reactor Regulation,
Division of Operating Reactor Licensing, O8E7
NRC/NRR/DORL/LPL4, MS O8H4A
Washington, DC 20555-0001
301.415.5136, 301.415.2102 (fax)
John.Klos@NRC.gov

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From: Klos, John

Created By: John.Klos@nrc.gov

Recipients:
"Klos, John" <John.Klos@nrc.gov>
Tracking Status: None
"Williams, Lisa L." <llwilliams@energy-northwest.com>
Tracking Status: None
"Christianson, Sandra J." <sjchristianson@energy-northwest.com>
Tracking Status: None

Post Office: HQPWMSMRS05.nrc.gov

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