NRR-DMPSPEm Resource

From: Kim, James
Sent: Wednesday, September 12, 2018 2:10 PM
To: Duke, Paul R.; Thomas, Brian J.
Cc: Marabella, Lee A.
Subject: Hope Creek AOT Final RAI-from PRA Branch
Attachments: APLA RAIs Hope Creek Inverter AOT final.scd.docx

By letter dated April 13, 2018 (Agencywide Documents Access management System (ADAMS) Accession No. ML18103A218), Public Service Enterprise Group Nuclear LLC (PSEG, the licensee), requested an amendment to the Renewed Facility Operating License NPF-57 for Hope Creek Generating Station (HCGS) Unit 1. The proposed license amendment request (LAR) would revise the Technical Specifications (TS) 3.8.3.1, "Distribution – Operating," to increase the allowed outage time (AOT) for restoring inoperable alternate current (AC) inverter(s) to operable status from 24 hours to 7 days.

The NRC staff from PRA Branch has determined that the additional information is required for the staff to complete its review and the licensee has agreed to respond to this request within 30 days of the date of this email (i.e., by October 5, 2018).
A publicly available version of this RAI (attached) will be placed in the NRC's ADAMS.

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REQUEST FOR ADDITIONAL INFORMATION BY THE PROBABILISTIC RISK ASSESSMENT LICENSING BRANCH, DIVISION OF RISK ASSESSMENT

LICENSE AMENDMENT REQUEST FOR EXTENSION OF ALTERNATING CURRENT BUS INVERTER ALLOWED OUTAGE TIMES

PSEG NUCLEAR LLC

HOPE CREEK GENERATING STATION

DOCKET NOS. 50-354 (EPID: L-2018-LLA-0101)

By letter dated April 13, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession Number ML18103A218), Public Service Enterprise Group Nuclear, LCC (PSEG, the licensee), submitted a license amendment request (LAR) regarding the Hope Creek Generating Station. The proposed amendment would revise Technical Specification (TS) 3.8.3.1, “Distribution - Operating,” to increase the allowed outage time (AOT) for one or both inverters inoperable in one channel from 24 hours to 7 days. The licensee states that the proposed change will allow increased flexibility in the scheduling and performance of corrective maintenance, allow better control and allocation of resources, and reduce the potential for unplanned plant shutdowns.

The Probabilistic Risk Assessment (PRA) Licensing Branch (APLA) of the Division of Risk Assessment (DRA) staff has reviewed the LAR and determined that additional information, related to PRA considerations described in the LAR, is required for the APLA staff to complete the review.

Regulatory Basis

Title 10 of the Code of Federal Regulations (10 CFR) Part 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," requires that preventive maintenance activities must be sufficient to provide reasonable assurance that structures systems and components (SSCs) are capable of fulfilling their intended functions. As it relates to the proposed inverter AOT extension, 10 CFR 50.65(a)(4) requires the assessment and management of the increase in risk that may result from proposed maintenance activities.

Section 50.63, "Loss of all alternating current power," requires that nuclear power plants must be able to withstand a loss of all alternating current (ac) power for an established period of time and recover from a station blackout.

The following are applicable regulatory guidelines and policy documents for evaluating the risk impact of the proposed change:

- Regulatory Guide (RG)1.174, Revision 2, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis,” May 2011 (ADAMS Accession No. ML100910006) describes an acceptable risk-informed approach for assessing changes to licensing bases.

- Regulatory Guide 1.177, Revision 1, "An Approach for Plant-Specific, Risk-Informed Decision-making: Technical Specifications," May 2011 (ADAMS Accession No.

- ML100910008) describes an acceptable risk-informed approach for assessing proposed permanent TS changes in AOTs. In addition, this RG provides risk acceptance guidelines for evaluating the results of such assessments.

- Regulatory Guide 1.200, Revision 2, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," March 2009 (ADAMS Accession No. ML090410014) describes an acceptable approach for determining whether the quality of the probabilistic risk assessment (PRA) models, in total or the parts that are used to support an application, is sufficient to provide confidence in the results, such that the PRA models can be used in regulatory decision making for light-water reactors.

- Regulatory Issue Summary (RIS) 2007-06, "Regulatory Guide 1.200 Implementation," March 2007 (ADAMS Accession No. ML070650428) describes how the Nuclear Regulatory Commission (NRC) will implement its technical adequacy review of plant-specific PRAs used to support risk-informed licensing actions after the issuance of RG 1.200.

Request for Additional Information

APLA RAI-1

Section 3.2.1 and Attachment 2 of the LAR provides a very detailed discussion about the licensees evaluation of the technical adequacy of the full-power internal events (FPIE) PRA to support the proposed amendment. The discussion includes some details that appear unnecessary, e.g. an extensive discussion of a 1999 peer review and results that were superseded by a 2008 full scope peer review. Other details are difficult to interpret, e.g., that the 2008 peer review was performed using the 2007 American Society of Mechanical Engineers (ASME) ASME PRA Standard endorsed in Regulatory Guide (RG) 1.200 Rev. 1 whereas Rev. 1 of RG 1.200 endorses, with qualifications, the ASME RA-Sb-2005 PRA Standard.

A previous staff review described in "Hope Creek Generating Station - Issuance of Amendment RE: Technical Specification Change for Permanent Extension to Type A and Type C Containment Leak Rate Test Frequencies" (ADAMS Accession No. ML17291A209) indicated that,

> "*…an independent full-scope peer review of the internal events and internal flooding PRA model was performed in 2008 against the requirements set forth in the 2005 version of the ASME PRA standard and the qualifications provided in the staff's endorsement of that standard in RG 1.200, Revision 1. The peer review was performed against the CC II Supporting Requirements. Following PRA model revisions arising from the peer review, the licensee performed a self-assessment of the Hope Creek [full-power internal events] FPIE PRA model in 2011 to determine if there were any gaps present between the Hope Creek FPIE PRA model and the CC II Supporting Requirements in the 2009 version of the ASME/American Nuclear Society.*"

Section 3.2.1 of the LAR further added that more recently "[*t]he Full Power Internal Events and Flooding PRA was the subject of a Facts and Observations (F&Os) closure review completed by the BWR Owners Group in August 2017 [ref]. At this time, there are no F&Os that are considered open.*"

Please confirm that the above summary of the internal events PRA reviews is current and correct or provide correction and clarification.

APLA RAI-2

In Section 3.2.1 of the LAR, the licensee states that in November 2010 it completed a full-scope peer review of its then current base Fire PRA. However, the licensee does not provide any details as to which standard the peer review was conducted against or what peer review method was used.

Please provide a discussion summarizing the standard to which the peer review was conducted against and the peer review method that was used.

APLA RAI-3

In the resolution to F&O 5-40, the licensee states that joint human error probabilities (JHEPs) are not risk-significant for the inverters or the reported risk evaluation.

Please characterize the process used to determination that JHEPs are not significant for the risk from inverters and provide any quantitative results.