NRR-PMDAPEm Resource

From: Galvin, Dennis
Sent: Friday, November 20, 2015 11:35 AM
To: Richard Hightower (Richard.Hightower@duke-energy.com)
Cc: Scott Connelly (Scott.Connelly@duke-energy.com); Barillas, Martha; Miller, Barry; Fields, Leslie; ONeal, Daniel; Dinsmore, Stephen; Green, Kimberly
Subject: Robinson Draft NFPA-805 Follow-Up RAIs - PRA (MF2746)
Attachments: Robinson NFPA-805 Draft PRA 3rd Round RAIs MF2746.docx

Richard/Scott,

By letter dated September 16, 2013 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML13267A211), Duke Energy Progress Inc., the licensee of H. B. Robinson Steam Electric Plant, Unit 2 (HBRSEP), submitted a license amendment request to change its fire protection program to one based on the National Fire Protection Association (NFPA) Standard 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," 2001 Edition, as incorporated into Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.48(c). By letters dated December 22, 2014, January 22, 2015, March 16, 2015, April 1, 2015, and July 31, 2015 (ADAMS Accession Nos. ML15005A073, ML15036A059, ML15079A025, ML15099A454, and ML15212A136), you provided responses to staff requests for additional information (RAIs). The NRC staff has determined that additional information is needed to complete its review related to probabilistic risk assessment (PRA). Please see the attached RAIs in DRAFT form.

A Sensitive Unclassified Non-Safeguards Information (SUNSI) review was completed by the staff on the draft RAIs and the staff concluded the RAIs do not contain SUNSI. If you find any information needs to be withheld from the public, please notify me within 5 days of receipt of this email.

Please submit your response to these RAIs within 30 days of this email. If you need a clarification call for the attached draft RAIs, or you need to change the RAI response due date, please contact me at (301) 415-6256.

Respectfully,

Dennis Galvin
Project Manager
NRC/NRR/DORL/LPL2-2
301-415-6256

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From: Galvin, Dennis

Created By: Dennis.Galvin@nrc.gov

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Options
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REQUEST FOR ADDITIONAL INFORMATION

REGARDING LICENSE AMENDMENT REQUEST TO ADOPT

NATIONAL FIRE PROTECTION ASSOCIATION STANDARD (NFPA) 805,

"PERFORMANCE-BASED STANDARD FOR FIRE PROTECTION

FOR LIGHT WATER REACTOR ELECTRIC GENERATING PLANTS,"

DUKE ENERGY PROGRESS, INC.

H. B. ROBINSON STEAM ELECTRIC PLANT UNIT NO. 2

DOCKET NO. 50-261

Probabilistic Risk Assessment (PRA) Request for Additional Information (RAI) 03.b.01

Confirm and modify as necessary the information in the following table that summarizes the resolution of the referenced RAIs as requested in PRA RAI 03.b (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14289A260). The following table includes (1) RAIs referenced by PRA RAI 03, (2) RAIs added based on the RAI responses, and (3) applicable follow-up RAIs. The "Reference" column refers to the date of the RAI response. As PRA RAI 03.b.01 is a supplement to PRA 03.b, a combined response to PRA RAI 03.b and PRA RAI 03.b.01 may be designated PRA RAI 03.b.01.

Note that the resolution of some referenced RAIs includes performing confirmatory sensitivity analyses demonstrating that an issue is negligible with respect to transition or additional changes to the PRA should be proposed. In performing such sensitivity studies, synergistic impacts, as described in PRA RAI 03.b, must also be addressed. If the results of the sensitivity study cannot demonstrate that the associated issue is also negligible with respect to future self-approval, then provide an implementation item that resolves the unacceptable method. These sensitivity analyses are identified with PRA RAI 01.c, PRA RAI 02.c, and PRA RAI 15.01.01.

RAI	Reference*	Resolution of referenced RAI in PRA
PRA RAI 01.a	January 22, 2015	RAI associated with Facts and Observations (F&Os) CF-A2-01 and FSS-E1-01. A description of what was done for addressing state of knowledge in the response to PRA RAI 03 should be provided. If mean values will not be generated post-transition, the response to PRA RAI 03 should also clarify how parametric uncertainty, including the state-of-knowledge correlation, will be addressed in the self-approval evaluation of post-transition changes.
PRA RAI 01.b	March 16, 2015	RAI associated with F&O CS-A1-01. No change to PRA methods. Confirm PRA is updated consistent with referenced RAI response.

PRA RAI 01.c	December 22, 2014	RAI associated with F&Os CS-A11-01 and FSS-E4-01. Describe and complete the confirmatory sensitivity analysis.
PRA RAI 01.g	March 16, 2015	RAI associated with F&O FSS-C7-01. No change to PRA methods.
PRA RAI 01.h	December 22, 2014	RAI associated with F&Os FSS-D7-01 and FSS-F3-02. No change to PRA methods.
PRA RAI 01.i	March 16, 2015	RAI associated with F&O FSS-G1-01. No change to PRA methods.
PRA RAI 01.j	March 16, 2015	RAI associated with FSS-G6-02. No change to PRA methods.
PRA RAI 01.k.01	July 31, 2015	RAI associated with MCR abandonment methods. No change to PRA methods.
PRA RAI 02.a	March 16, 2015	RAI associated with F&O IE-C3-01. No change to PRA methods. Confirm PRA is updated consistent with RAI response.
PRA RAI 02.c	March 16, 2015	RAI associated with F&O LE-E1-01. Describe and complete the confirmatory sensitivity analysis.
PRA RAI 04	March 16, 2015	See PRA RAIs 05, 06, 11, 14, 16 and 18 as well as associated follow-up RAIs: 05.a.01, 05.c.01, 06.01, 16.01, 16.02 and 18.01. Two issues are under review (refer to PRA RAIs 05.c.01.01 and 16.01.01).
PRA RAI 05.a	March 16, 2015	No change to PRA methods.
PRA RAI 05.a.01	April 1, 2015	RAI associated with Frequently Asked Question (FAQ) 14-0009 guidance. No change to PRA methods.
PRA RAI 05.b	March 16, 2015	RAI associated with NUREG/CR-6850, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities, Volume 2: Detailed Methodology," September 2005 (ADAMS Accession No. ML052580118) and FAQ 08-0042 guidance. Confirm PRA method is changed consistent with the referenced RAI response.
PRA RAI 05.c	March 16, 2015	RAI associated with FAQ 14-0009 guidance. No change to PRA methods with regard to motor control centers (MCCs). Confirm methodology is consistent with final FAQ 14-0009. For non-MCC cabinets, see PRA RAI 05.c.01.
PRA RAI 05.c.01	July 31, 2015	RAI associated with NUREG/CR-6850 guidance and the inapplicability of FAQ 14-0009 guidance. This issue is under evaluation (refer to PRA RAI 05.c.01.01).
PRA RAI 06	January 22, 2015	RAI associated with FAQ 13-0004 guidance. Confirm PRA method is changed consistent with the referenced RAI response.
PRA RAI 06.01	July 31, 2015	RAI associated with sensitive electronics outside of FAQ 13-0004 guidance. Confirm PRA method is changed consistent with the referenced RAI response.

PRA RAI 07	March 16, 2015	No change to PRA methods.
PRA RAI 10	January 22, 2015	RAI associated with FAQ 13-0006 guidance. Confirm PRA method is changed consistent with FAQ 13-0006 guidance (as suggested by the referenced RAI response).
PRA RAI 11	March 16, 2015	No change to PRA methods.
PRA RAIs 12 and 12.01	January 22, 2015 and July 31, 2015	RAI associated with guidance in Supplement 1 to NUREG/CR-6850. Confirm PRA method is changed consistent with the referenced RAI responses.
PRA RAI 14	December 22, 2014	RAI associated with Volume 2 of NUREG/CR-7150, "Joint Assessment of Cable Damage and Quantification of Effects from Fire," May 2014 (ADAMS Accession No. ML14141A129) guidance. Confirm PRA method is changed consistent with the referenced RAI response.
PRA RAIs 15, 15.01, and 15.01.01	March 16, 2015, April 1, 2015, and July 31, 2015	RAI related to fire probabilistic risk assessment (FPRA) modeling associated with the lack of breaker coordination. Consistent with the response to Part (a) of PRA RAI 15.01.01, PRA method is changed. This issue is still under evaluation (refer to PRA RA 15.01.01.01). Describe and complete any confirmatory sensitivity analysis
PRA RAI 16	January 22, 2015	No change to PRA methods with regard to in-cabinet incipient detection credit. For area-wide and main control room (MCR) incipient detection credit, see PRA RAIs 16.01 and 16.02, respectively.
PRA RAI 16.01	July 31, 2015	RAI associated with area-wide incipient detection credit. This issue is still under evaluation (refer to PRA RAI 16.01.01). Describe and complete any confirmatory sensitivity analysis.
PRA RAI 16.02	July 31, 2015	RAI associated with MCR incipient detection credit. Confirm PRA method is changed consistent with the referenced RAI response.
PRA RAIs 18 and 18.01	March 16, 2015 and April 1, 2015	No change to PRA methods.
PRA RAI 19	March 16, 2015	No change to PRA methods.
PRA RAI 26	March 16, 2015	No change to PRA methods.
PRA RAI 29	December 22, 2014	RAI associated with FAQ 09-0057 guidance. No change to PRA methods. Confirm PRA is updated consistent with RAI response.
PRA RAIs 30 and 30.01	March 16, 2015 and July 31, 2015	RAI associated with Reactor Coolant Pump (RCP) Shutdown Seals (SDS). Confirm PRA used in support of the License Amendment Request (LAR) is consistent with the response to PRA RAI 30 and PRA used in support of self-approval will be updated consistent with the implementation item proposed in the response to PRA RAI 30.01.

PRA RAI 34	March 16, 2015	RAI associated with use of fire ignition frequencies from Supplement 1 to NUREG/CR-6850. Sensitivity analysis required. The results of the sensitivity study, which were requested in PRA RAI 34 but not provided in the March 16, 2015 letter, are to be included in the response to PRA RAI 03.
Fire Modeling (FM) RAI 01.b.01.01	July 31, 2015	RAI associated with fire propagation and zone of influence modeling changes to be updated in the FPRA. Describe and confirm the fire modeling update for the FPRA consistent with the RAI response.
FM RAI 01.b.01.02	July 31, 2015	RAI associated with a fire modeling method related to hot gas layer. Confirm that the acceptable method described in the supplement to FM RAI 01.b.01.02 and any follow-on FM RAIs is included in the response to PRA RAI 03.

*ADAMS Nos. associated with RAI Responses in Table
December 22, 2014 - ADAMS Accession No. ML15005A073
January 22, 2015 - ADAMS Accession No. ML15036A059
March 16, 2015 - ADAMS Accession No. ML15079A025
April 1, 2015 - ADAMS Accession No. ML15099A454
July 31, 2015 - ADAMS Accession No. ML15212A136

PRA RAI 05.c.01.01

The response to PRA RAI 05.c.01 (ADAMS Accession No. ML15079A025) states that the treatment of well-sealed and robustly secured cabinets that are not MCCs is consistent with NUREG/CR-6850, as clarified by FAQ 08-0042. The response does not, however, appear to address the statement in Chapter 6 of NUREG/CR-6850 that indicates that for cabinets housing circuits of above 440V, “an arcing fault could compromise panel integrity (an arcing fault could burn through the panel sides, but this should not be confused with the high energy arcing fault type fires)." Justify the FPRA’s treatment of such arcing faults for well-sealed and robustly secured cabinets that are not MCCs and that operate at 440V or greater.

PRA RAI 15.01.01.01

PRA RAI 15 (ADAMS Accession No. ML14289A260) requested information about how inadequate breaker fuse coordination was accounted for in the FPRA. The response to PRA RAI 15 did not mention secondary fires which is one of the two failure modes caused by lack of coordination. PRA RAI 15.01 (ADAMS Accession No. ML15057A403) requested clarification about how secondary fires caused by inadequate breaker fuse coordination is addressed and will be modeled in the FPRA. The response to PRA RAI 15.01 (ADAMS Accession No. ML15099A454) stated that the FPRA does not “currently” model these secondary fires. The response also stated that cable protection against overloads is a consideration in the general design criteria (GDC) but “is limited in application.” The response did not state whether or not secondary fires will be modelled in the PRA. PRA RAI 15.01.01 (ADAMS Accession No. ML15182A193) requested clarification if the GDC reference precluded secondary fires and, if not, requested that secondary fires be modeled in the FPRA. The response to PRA RAI 15.01.01 (ADAMS Accession No. ML15212A136) indicated that all secondary fires are not precluded by the GDC reference and stated that (1) the risk of secondary fires due to cables

associated with “SSA [safe shutdown analysis] and FPRA equipment and other equipment important to plant operations” will be included in the updated risk results to be provided in response to PRA RAI 03 and (2) the risk of secondary fires due to cables associated with equipment “not identified as important for plant safety and operation” will be assessed as part of a separate sensitivity study using “bounding engineering analyses”. However, the original question in PRA RAI 15 as clarified in PRA RAI 15.01 about how secondary fires are accounted for in the FPRA was never answered because none of the responses clarify how secondary fires caused by inadequate breaker fuse coordination will be modeled in the FPRA. Describe and justify the modeling approaches used to assess the risk of secondary fires for the FPRA and the supporting sensitivity study.

PRA RAI 16.01.01

The response to PRA RAI 16.01 (ADAMS Accession No. ML15212A136) did not address the question which was related to the use of Appendix P. The response cites draft NUREG-2180, “Determining the Effectiveness, Limitations, and Operator Response for Very Early Warning Fire Detection Systems in Nuclear Facilities (DELORES-VEWFIRE),” for incorporating area-wide incipient detection credit into the FPRA. Therefore, currently, no acceptable method has been demonstrated for including area-wide incipient detection credit in the FPRA. The NRC staff requests the following information to evaluate for transition:

a. Provide the results of a sensitivity study (core damage frequency (CDF), delta (Δ) CDF, large early release frequency (LERF), ΔLERF) which removes credit for area-wide incipient detection although credit for the Halon system could be retained consistent with current acceptable guidance. If the FPRA credits the Halon system for this fire area, discuss the approach for modeling it consistent with acceptable guidance.

b. Provide an implementation item to update the FPRA with an NRC-accepted method prior to self-approval to credit area-wide incipient detection.

PRA RAI 30.02

The response to PRA RAI 30 (ADAMS Accession No. ML15079A025) revises Implementation Item 11 of LAR Table S-3 to reference Table S-2; however, while Table S-2 addresses planned modifications, it does not include procedure updates, which appear to be in Table S-3. Risk and change-in-risk results should be re-evaluated after both modifications and procedure updates are completed. Clarify that Implementation Item 11 will also include procedure updates as described in Table S-3.