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January 2, 2020

MEMORANDUM TO: Jennifer Whitman, Chief
PRA Licensing Branch B
Division of Risk Assessment
Office of Nuclear Reactor Regulation

FROM: Shivani Mehta, Engineer
PRA Licensing Branch B
Division of Risk Assessment
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF THE DECEMBER 3, 2019 CATEGORY 2 PUBLIC MEETING ON FIRE PROBABILISTIC RISK ASSESSMENT REALISM TOPICS

On December 3, 2019, the U. S. Nuclear Regulatory Commission (NRC) staff held a public teleconference with industry stakeholders and the public to discuss fire Probabilistic Risk Assessment (PRA) realism topics.

The agenda included the discussion of the following topics:

- Potential changes to the risk criteria for self-approval in performance-based, risk-informed fire protection programs under National Fire Protection Association (NFPA) Standard 805, *Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants*
- Industry comments on NFPA 805, Chapter 3, "Requirements for Approval"
- Update on NRC, Office of Regulatory Research (RES) fire PRA activities
- Status update on Regulatory Guide (RG) 1.205, Revision 2

Enclosure:
List of Meeting Attendees

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With respect to the self-approval criteria for NFPA 805, industry provided a presentation, "10CFR 50.48(c) – NFPA 805 Self-Approval Risk Threshold, Measuring a Blade of Grass," (ML19333B950) which was also given at the recent Nuclear Energy Institute (NEI) Risk Informed Regulation and Fire Protection Forum. The presentation supported raising the risk criteria and thus enabling licensee analyses of fire protection program (FPP) changes with higher risk to qualify for self-approval. Among industry's arguments for this change to the criteria were the results of an industry analysis comparing the quantitative health objectives (QHO) with the risk guidelines of $1x10^{-5}$/reactor-year for large early release frequency (LERF) and $1x10^{-4}$/reactor-year for core damage frequency (CDF). With respect to slide number 7 of the presentation, the staff commented that industry statements, including indicating that the LERF guideline of $1X10^{-5}$/reactor-year has a margin of 100,000, significantly exaggerates the reactor safety margins over NRC safety goals. In response, staff stated that a factor of a 100,000 margin, if accurate, implies that an acceptable LERF would be approximately one early release per reactor-year. One early release per reactor-year is inconsistent with the NRC Safety Goal to ensure the safe use of radioactive materials so that the Nation can continue to use radioactive materials for civilian purposes while avoiding radiation exposures and releases of radioactive materials that harm people or the environment (ML18032A561).

Furthermore, NFPA 805 states that, "[t]he evaluation process shall compare the risk associated with implementation of the deterministic requirements with the proposed alternative. The difference in risk between the two approaches shall meet the risk acceptance criteria" and that "the cumulative effect of those changes shall be evaluated." In its presentation, the staff indicated that the lower risk thresholds for self-approval do not require an evaluation of cumulative risk for FPP changes because the staff position discussed in RG 1.200 is that the cumulative impact of such small changes will remain acceptable (ML19336A870).

The industry presented a template for NFPA 805 license amendment requests (LARs) to allow an evaluation method to self-approve minor deviations from certain NFPA 805, Chapter 3 requirements (ML19336B458). The speaker on behalf of the industry, Mr. Rubano, stated that for many NFPA 805 licensing applications, licensee requests to approve risk-informed and performance-based deviations from certain Chapter 3 elements were approved. As such, the industry is proposing a LAR that revises the fire protection license condition to allow additional deviations without submittal to the NRC for approval. The industry discussed their proposed evaluation and acceptance criteria. NRC staff stated that such a LAR would be reviewed in accordance with NRC process, if submitted. However, staff indicated that industry would need to fully develop justifications for the proposed changes.

NRC/RES provided updates on NUREGs that are currently under development:

- NUREG 2230/EPRI 3002016051, "Methodology for Modeling Fire Growth and Suppression Response of Electrical Cabinet Fires in Nuclear Power Plants" – report has been completed. The Electric Power Research Institute (EPRI) published the report as EPRI Report number 3002016051 in November 2019. The NRC version has been submitted to OGC for Congressional Review Act (CRA) review.

- NUREG 2178, Volume 2/ EPRI 3002016052, "Refining and Characterizing Heat Release Rates from Electrical Enclosures during Fire – Volume 2: Fire modeling guidance for electrical cabinets, electric motors, indoor dry transformers, and the main control board," The joint NRC/EPRI working group has resolved public comments and submitted the

report to EPRI publications for finalization. The report is expected to be published by EPRI in late December 2019 or early January 2020. Once the final report is complete, it will be submitted to OGC for CRA review.

- NUREG 2232/EPRI 3002015997, “Heat Release Rate and Fire Characteristics of Fuels Representative of Typical Fire Events in Nuclear Power Plants” - The report is complete and available on the EPRI web site. The NRC version has been submitted to NRC publications for final review and publishing.

- NUREG 2233/EPRI 3002016054, “Methodology for Modeling Transient Fires in Nuclear Power Plant Fire Probabilistic Risk Assessment.” The public comment period opened on January 2, 2020. The joint NRC/EPRI working group will resolve comments and expects to submit to the final report for publication by February 2020.

NEI inquired about whether licensees can start to use the information found in EPRI 3002016051 before the corresponding NUREG-2230 is published by the NRC. This led to a discussion on the potential endorsement of NUREGs developed under the Memorandum of Understanding (MOU) between EPRI and the NRC, where delays might exist between the completed document and its formal publication by the NRC. The staff stated that the Office of Nuclear Reactor Regulation (NRR) does not typically endorse NUREGs but has done so for specific reasons on a case-by-case basis in the past. The staff indicated that it would discuss the topic internally and work with industry to determine whether a regulatory mechanism exists or could be developed to provide industry confidence in the methods or data found in certain NUREGs.

The NRC staff provided an update on the status of the new revision of RG 1.205, “Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants,” Revision 2, which will endorse NEI 04-02, “Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c),” Revision 4. The final draft of NEI 04-02 which NRC staff received from NEI had items that were not consistent with NRC regulatory positions and would be subject to explicit exceptions in the revised RG 1.205. NEI agreed to re-evaluate the changes and inform NRC staff whether the changes would remain or be removed in the final version of NEI 04-02.

During the public comment period, Mr. Ernie Kee, provided his thoughts on the use of probabilistic risk assessment in utility and regulatory decision-making. His comments were also provided to NRC staff via email (ML19345D988).

J. Whitman

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FIRE PROBABILISTIC RISK ASSESSMENT REALISM TOPICS
LIST OF MEETING ATTENDEES

December 3, 2019

U.S. Nuclear Regulatory Commission Staff

Jennifer Whitman	Stephen Dinsmore	Jay Robinson
JS Hyslop	Shivani Mehta	Nicholas Melly
Brian Metzger	Charles Moulton	David Stroup
Thinh Dinh	Sunil Weerakody	

Industry Stakeholders

Andy Ratchford (Jensen Hughes)
Bradley Dolan (Tennessee Valley Authority)
Geoffrey Kvamme (Xcel Energy)
Jeff Miller (Enercon)
Jessica Walker (Jensen Hughes)
Kiang Zee (Jensen Hughes)
Robert Cavedo (Exelon)
Tatsuya Sakurahara
Victoria Anderson (Nuclear Energy Institute)
Vicken Khatchad
Vincent Rubano (Jensen Hughes)
Brendan Overton (NuScale)

ENCLOSURE