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May 24, 2017

MEMORANDUM TO: Kevin Hsueh, Chief  
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Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

FROM: Joseph J. Holonich, Senior Project Manager /RA/  
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SUBJECT: SUMMARY OF APRIL 11, 2017, MEETING TO DISCUSS  
APPENDIX A OF NEI 16-16, "GUIDANCE FOR ADDRESSING  
DIGITAL COMMON CAUSE FAILURE"

On April 11, 2017, the U.S. Nuclear Regulatory Commission (NRC) staff met with representatives from the Nuclear Energy Institute (NEI). The purpose of the meeting was to preview Appendix A of NEI 16-16 [Draft 2], "Guidance for Addressing Digital Common Cause Failure," which will be submitted by NEI in late April 2017 ([Draft 1] can be found at Agencywide Documents Access and Management System (ADAMS) Accession No.: ML17033B139). All information related to the meeting and discussed in this summary can be found in the ADAMS package accession number ML17073A197.

In the meeting, NEI gave an overview of the defensive measures described in Appendix A and intended to address four types of common cause failure (CCF) sources, such as: random hardware failure in a shared resource, environmental disturbances, design defects, and operations or maintenance. During the discussions, the NRC staff noted that more clarity was needed about the purpose and scope of NEI 16-16. For example, the NRC staff was under the impression the content in NEI 16-16 was intended to provide the technical basis for performing digital upgrades under Title 10 of the *Code of Federal Regulations* (10 CFR,) Section 50.59 evaluations. Clarification was provided that, the purpose of the document was not limited to 10 CFR 50.59 evaluations but also included information that could be provided in license amendment requests. NEI agreed to consider adding clarification regarding the scope in Draft 2 of NEI 16-16 and to clarify how to use the information in Appendix A. In addition, NEI will clarify that NEI 16-16 is intended to cover all instrumentation and control systems described in the final safety analysis report (FSAR).

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NEI described the different defensive measures described in Appendix A. In addition, NEI described the likelihood reduction measure, which will only apply to design defects. NEI also noted that these measures are based on the information provided in NUREG-0800, "Standard Review Plan," BTP 7-19, "Guidance for Evaluation of Diversity and Defense-In-Depth in Digital Computer-Based Instrumentation and Control Systems." The NRC staff suggested examples be included in NEI 16-16.

A question arose on the acceptance criteria to determine if the results from a coping analysis are bounded. In particular whether the results obtained from using best-estimate methods could be used to support 10 CFR 50.59 assessments (by being compared with the analysis results in the FSAR). In addition, the NRC staff noted the use of the determination of an analysis result being "bounded" in NEI 16-16 should be consistent with the concept provided NEI 96-07 "Supplemental Guidance for Application of 10 CFR 50.59 to Digital Modifications," Appendix D (ADAMS Accession No. ML16126A197).

In response to this discussion, NEI agreed to further discussions at the April 19, 2017, NEI 96-07, Appendix D meeting. In addition, the staff asked NEI to review examples 4-20 and 4-22 in NEI 96-07, Appendix D to ensure there was consistency among the determination of analysis results being bounded, and at what level (i.e., plant level) the results are being accepted and compared.

During the meeting, the NRC staff asked NEI how the information in NEI 16-16 relates to NRC regulations, and how applicants can use such information to meet NRC regulations. Also, NRC staff suggested that NEI 16-16 state that the defensive measures described are only recommendations and not requirements for addressing CCF.

As a result of the meeting, it was recommended that interactions be held on a more frequent basis between NEI and NRC staff. It was decided that interaction placeholders be scheduled every two weeks following NEI's submission of NEI 16-16 [Draft 2] at the end of April. The purpose of these biweekly interactions is to clarify staff questions about Draft 2 that may be resolved quickly without a lengthy correspondence cycle between NRC and NEI.

In closing the discussions, the NRC staff committed to prioritize the items in the table (Appendix A) provided by NEI according to ease of review and alignment between NRC and NEI staff. A copy of the table can be found in the ADAMS meeting package.

The final meeting agendum was stakeholder participation. One stakeholder asked the NRC staff if it had made the technical document from the Electric Power Research Institute (EPRI), which is the basis for NEI 16-16, Appendix A, public. NRC staff responded that the document had been purchased and was not publically available because it was protected by copyright. The content will be inserted into NEI 16-16 [Draft 2], Appendix A per an agreement by NEI and EPRI.

Another stakeholder asked questions and provided comments on: (1) beyond design basis events that use best estimate methods (e.g., anticipated transient without scram), (2) if NRC staff expected likelihood reduction measure examples in NEI 16-16, Appendix A, and (3) the "bounded" definition included in NEI 16-16. NRC staff did not respond to each individual question because the individuals who could provide information were not available. Following the meeting, this stakeholder provided an email documenting his questions and comments. The email is included in the ADAMS meeting package.

Actions from the meeting included:

- 1) NEI will clarify the purpose and scope in Draft 2 of NEI 16-16, Appendix A and clarify what Appendix A would be used to do.
- 2) NEI agreed to look at reviewing examples 4-20 and 4-22 of NEI 96-07, Appendix D to ensure there was consistency on how the terms and concepts (e.g., analysis result is bounded) used among the different documents, such as NEI 96-07, Appendix D, the Regulatory Information Summary being prepared by the staff, and NEI 16-16.
- 3) NRC staff will prioritize the items in the NEI table (Appendix A) according to ease of alignment.

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APPENDIX A OF NEI 16-16, "GUIDANCE FOR ADDRESSING DIGITAL  
COMMON CAUSE FAILURE" DATED: MAY 24, 2017

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