

October 3, 2016

MEMORANDUM TO: Kevin Hsueh, Chief  
Licensing Processes Branch  
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 AUGUST 24, 2016, MEETING TO DISCUSS  
DRAFT APPENDIX D OF NEI 96-07, "SUPPLEMENTAL GUIDANCE  
FOR APPLICATION OF 10 CFR 50.59 TO DIGITAL MODIFICATIONS"

On August 24, 2016, U.S. Nuclear Regulatory Commission (NRC) staff met with representatives from the Nuclear Energy Institute (NEI). The purpose of the meeting was to discuss topics and issues related to Draft Appendix D of NEI 96-07, "Supplemental Guidance for Application of 10 CFR [Title 10 of the *Code of Federal Regulations*] 50.59 to Digital Modifications." Information related to the meeting, including presentations, NEI 96-07, Appendix D, and the attendees list, can be found in the Agencywide Documents Access and Management System (ADAMS) package accession number ML16231A356.

NEI presented slides on Appendix D, Section 5.5, "Example 4 – Replacement of Redundant Control Systems." Slide No. 3 of the presentation stated the expectation that any discrepancies between the guidance in the body of Appendix D and the example should be identified.

The NRC staff expressed the concern that the example did not follow the guidance in the body of the document in several ways:

- Appendix D, Section 3.1, "Introduction," contains guidance regarding the "adversity" of an analog to digital upgrade. This guidance states that not all analog-to-digital upgrades are a fundamental change and therefore adverse. However the guidance does not identify any ways that digital upgrades could potentially be a fundamental change or adverse. Because Example 4 did not address fundamental changes, the NRC staff questioned if the guidance in Section 3.1 should be interpreted as saying that no analog-to-digital upgrade is a fundamental change. NEI reiterated that a proposed activity involving a digital modification does not necessarily involve a fundamental change in how a design function is performed (e.g., automatically or manually, by measuring temperature or by measuring pressure) and the individual performing a Title 10 of the *Code of Federal Regulations*, Section 50.59 (10 CFR 50.59) review would have to examine each proposed activity to confirm whether there was a fundamental change as part of that activity.

- Example 4 states that the incorporation of the same software in more than one (formerly independent) control system is adverse and would screen in (i.e., requires a 50.59 Evaluation). This guidance should be included in Section 3, and not provided solely in an example.
- Appendix D, Section 3.2.1.2, “Combination of Components/Functions,” contains five pages of guidance and examples. The guidance (approximately 1 page in length) does not contain any criteria regarding the existence of the same software in redundant control systems. Furthermore, Example 3.3 (in Section 3.2.1.2) states:

“(4) There is no deviation from, or reduction in, the separation or independence as described in the UFSAR [updated final safety analysis report]. Each of the analog control systems will be replaced with its own digital control system.” *(Emphasis added)*

However, in contradiction to Example 3.3, Example 4 states:

“...since identical software will be used in each digital control system, there is an adverse impact on the independence...”

In the meeting NEI stated that as described in Example 3.3, the two control systems existed only for operational convenience and not due to a regulatory requirement to provide redundancy. As illustrated in Example 4, an analog to digital upgrade that incorporates the same software in redundant (formerly independent) channels, which are described as such in the UFSAR to meet a regulatory requirement, is adverse, screens in, and requires a 10 CFR 50.59 evaluation.

After discussing Example 4 as provided in Appendix D, meeting participants discussed how the outcome could differ based on a different licensing basis as described in an UFSAR.

NEI representatives understood and acknowledged the NRC staff concern to approve Appendix D for use without first having resolved the technical aspects of the decisions and classifications that are key to the outcome of its implementation. For example, Appendix D includes the term “CCF [common cause failure] Unlikely.” The NRC staff noted that it cannot finalize a position on Appendix D until the NRC staff has established exactly what “CCF Unlikely” means and how it can be determined and justified for a particular application.

Parking Lot/Action Items from the August 24, 2016, meeting are:

- 1) In a future meeting, discuss an example demonstrating the use of coping analysis in Appendix D. – NEI
- 2) NEI will look at revising Appendix D to use common terminology already defined in the regulations and guidance. Any new definitions such as “layers of design,” “variety,” “related,” and “unrelated” need to be discussed and the definitions agreed upon. – NEI/NRC.
- 3) Discuss where Appendix D addresses if the introduction of software is adverse (NEI 01-01). – NEI

- 4) In a future meeting, discuss an example of combination of functions that would be adverse. – NEI
- 5) Pointers are needed to show where Appendix D relies on the guidance in the main body of NEI 96-07. – NEI
- 6) Check for clear guidance on use of existing UFSAR content to identify the level of detail needed in plant-specific analyses using Appendix D. – NRC/NEI
- 7) Identify what is adequate documentation (i.e., commercial grade dedication). – NEI
- 8) Determine how to incorporate the subject of electromagnetic/radiofrequency interference into Appendix D so that they are addressed in plant-specific analysis if they are not currently in the licensing basis. – NEI
- 9) Provide examples of bounding of accidents of a different type. – NEI
  - a) Discuss the term “related” used in the guidance for Question (v).
  - b) Why does “bounding” apply to accident of a different type?
- 10) Discuss, for possible inclusion in Appendix D, what constitutes adequate documentation of technical work for justification of 10 CFR 50.59 screen and evaluation conclusions. – NRC/NEI
- 11) Clarify the treatment of “Accidents” versus “Malfunctions” in NEI 96-07 and Appendix D. – NEI

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**ADAMS Accession Nos.: Package (ML16231A356); Summary (ML16238A003); \*Via email**

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