



RG 1.187, Revision 2

NRC's Endorsement of NEI 96-07, Appendix D

**Public Meeting
June 25, 2019**

Meeting Objectives

- Table-top exercise of digital I&C upgrades applying Appendix D, Criterion 6 guidance
 - Specific industry upgrade needs in which digital CCF likelihood across multiple trains is not “sufficiently low,” and Criterion 6 is a factor.
 - NRC examples from FSARs in which Appendix D language may lead to a incorrect conclusion of a “different result”
- Clarify what NEI believes constitutes a “safety analysis” for types of digital I&C upgrade examples

Example - Diesel Generators (Voltage Regulators)

- Component: EDG provides essential 4160 volt essential auxiliary power as described in Chapter 8 of FSAR. Two redundant trains.
- Component malfunction: Single failure of one EDG, such as the voltage regulator, is assumed in FSAR.
- A digital modification is implemented to voltage regulator controls and the licensee cannot demonstrate CCF across multiple trains is “sufficiently low” through a qualitative assessment.
- A voltage regulator malfunction of multiple trains could cause failure to provide essential power to reactor protection and core cooling systems.
- A 50.59 needs to be based on the UFSAR, and this modification would require a license amendment because failure of voltage regulators would prevent redundant EDGs from providing power and impact UFSAR design functions.
- If 50.59 based on Appendix D there may not be a different result because a “safety analysis” failure of voltage regulators is not provided in Chapters 8 or 15 of FSAR - No LAR and independent NRC review needed.

Example - RCS PORVs

- Component: Power Operated Relief Valve (PORV) operation to control RCS pressure during low temperature operations
- Component malfunction: Failure to control pressure. Evaluated and results described in Chapter 5 in the FSAR, but not described in the Chapter 15 accident analysis
- A digital modification is implemented and the licensee cannot demonstrate CCF is “sufficiently low” through qualitative assessment.
- CCF could cause new failure modes with a pressure excursion challenging low temperature fracture limits of the pressure boundary.
- A 50.59 evaluation needs to be based on the UFSAR, and this modification would require a license amendment because there is a and different result considering Chapter 5.
- If 50.59 based on Appendix D, there may not be a different result because a pre-existing “safety analysis” does not exist in Chapter 15 - No LAR or independent NRC review would be needed.

Example - Safety Display Controls

- Component: Safety related display instrumentation. Provide minimum and timely information to the operator.
- Component malfunction: Failure of one train evaluated in Chapter 7 in the FSAR, but not described in the Chapter 15
- A digital modification is implemented and the licensee cannot demonstrate CCF across multiple trains is “sufficiently low” through qualitative assessment.
- A malfunction of multiple trains could cause failure of operators to adequately monitor reactor and containment conditions, and safety related systems.
 - Prevents operations from taking manual actions to accomplish the UFSAR-described design function during anticipated occurrences or events.
- A 50.59 needs to be based on the UFSAR and this modification would require a LAR because of inability to take operator actions creates a different result considering Chapter 7
- If based on Appendix D there may not be a different result because a pre-existing “safety analysis” does not exist - - No LAR or independent NRC review would be needed.



Current Schedule

Activity – Issuance of Final RG 1.187, Rev. 2	Date
45-day Public Comment Period Begins	May 30, 2019
45-day Public Comment Period Ends	July 14, 2019
NRC Completes Public Comment Resolution	August 2019
Issuance of Final RG 1.187, Revision 2	Fall 2019



Background Slides

Background

- From April 2016 through 2017, the NRC staff and industry participated in monthly public meetings to resolve NRC comments on draft NEI 96-07, Appendix D
- In December 2017, NEI and the NRC staff mutually agreed to place the review of NEI 96-07, Appendix D on hold to dedicate resources to the issuance of RIS 2002-22, Supplement 1
- RIS 2002-22, Supplement 1, was issued on 05/31/18
- In July 2018, NEI provided an update to NEI 96-07, Appendix D
- In August 2018, the NRC staff provided a set of comprehensive comments (85 total) to NEI, and began a disciplined process for cataloging and tracking comments for resolution
- Public meetings were held with industry on 8/30/18, 9/11/18, 10/11/18, and 11/14/18 to resolve these comments. Over 90% of the comments were resolved using this process
- NEI submitted its final revision of NEI 96-07, Appendix D to the NRC on 11/30/18. Letter requesting endorsement submitted 1/08/19

Background

- The NRC has conducting many public meetings on NEI 96-07, Appendix D in which:
 - NEI has presented the background of the current wording in Appendix D, Section 4.3.6
 - NRC staff has discuss why it does not agree with the current wording.
 - The NRC staff believes that the intent of 10 CFR 50.59 Criterion VI is consistent with Commission policy described in the **final** rule Statements of Consideration (SOCs)
- There is an exception on Section 4.3.6 in NRC's endorsement to Appendix D (RG 1.187, Rev. 2) that was published for a 45-day public comment period on May 30, 2019

Background

- Draft RG 1.187 Rev.2, Section C.2.e, “Section 4.3.6 of NEI 96-07, Appendix D” states the staff’s exception to section 4.3.6
- NRC staff has explained the exception reasoning and the final paragraph in Section C.2.e takes one of the examples in Appendix D (Radiation Monitor) and applies the NRC’s exception to the example
- NRC staff believes that Section C.2.e is clear on what a licensee will need to evaluate if it cannot demonstrate through a “Qualitative Assessment” that a proposed digital modification has “a sufficiently low likelihood of failure.”

Other Examples

- **Radiation Monitors** – Radiation monitors are relied upon for containment protection, control room protection, and emergency response actions. NEI claims in Appendix D Example 4-19 that the GDCs do not require single failure analysis and are not credited in the “safety analysis.” Therefore, a CCF of multiple monitors need not be analyzed at all, and does not cause a different result.
- **Feedwater Controls** – Failure of feedwater valve is currently evaluated and approved in FSAR. NEI specifically implies in Appendix D Example 4-18 that accident chapter analyses can be re-ran for CCF of multiple valves, as long as the result does not exceed an overall DNBR safety limit. NEI 96-07 already has a similar digital feedwater upgrade example. It notes that a different result is not created if “if the results of the malfunctions of the component or subsystem is the same as or is bounded by the results of malfunctions currently described in the USFAR”
- **HPCI Speed Controls** – Important for providing emergency cooling water. Not clear that the use of Appendix D would lead to a conclusion that there is not an existing “safety analysis” for a CCF of multiple speed controllers because such components are not explicitly described in FSAR.