



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001**

June 20, 2019

The Honorable Kristine L. Svinicki  
Chairman  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**SUBJECT:** REVIEW OF NUCLEAR ENERGY INSTITUTE (NEI) 96-07, APPENDIX D, "SUPPLEMENTAL GUIDANCE FOR APPLICATION OF 10 CFR 50.59 TO DIGITAL MODIFICATIONS," DATED NOVEMBER 2018, AND THE NRC'S ASSOCIATED DRAFT REVISION 2 TO REGULATORY GUIDE 1.187, "GUIDANCE FOR IMPLEMENTATION OF 10 CFR 50.59 CHANGES, TESTS AND EXPERIMENTS"

Dear Chairman:

During the 664th meeting of the Advisory Committee on Reactor Safeguards, June 5-7, 2019, we met with representatives of the NRC staff and the Nuclear Energy Institute (NEI) to review the subject documents. Our Digital Instrumentation and Control (DI&C) Subcommittee reviewed these documents on April 16, 2019. These documents were issued for public comment on May 30, 2019.

**CONCLUSIONS AND RECOMMENDATIONS**

1. Guidance for applying 10 CFR 50.59 to DI&C systems has been needed. This stems from the inherently different failure characteristics of systems that include DI&C equipment and from the unique and far-reaching potential impacts of DI&C system common-cause events.
2. Draft Revision 2 to Regulatory Guide 1.187, that endorses NEI 96-07, Appendix D, with exceptions and clarifications, provides an acceptable and timely approach for applying 10 CFR 50.59 guidance when conducting DI&C modifications.
3. A staff exception to NEI 96-07, Appendix D, requires consideration of more than the safety analysis within the updated final safety analysis report (UFSAR) and, thereby constrains its application. There is an opportunity for expanding the use of 10 CFR 50.59 for DI&C modifications by more clearly identifying the significance of different results caused by a malfunction of a Structure, System, and Component (SSC) important to safety as specified in Criterion 6. The use of risk-informed or other methods should be considered. This is a longer-term issue and may require a rule change.
4. The staff should provide final Revision 2 to Regulatory Guide 1.187 for our review following resolution of public comments.

## **BACKGROUND**

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.59, “Changes, Tests and Experiments,” paragraph (c)(1) authorizes a licensee to make changes in the facility or procedures described in its UFSAR or perform tests or experiments not described in its UFSAR without obtaining a license amendment pursuant to 10 CFR 50.90, “Application for amendment of license, construction permit, or early site permit,” only if (i), a change to the facility’s technical specifications is not required and (ii), the change, test, or experiment does not meet any of the eight criteria in 10 CFR 50.59(c)(2). The NRC issued the final rule that adopted the eight criteria on October 4, 1999, and it took effect on March 13, 2001.

Nuclear Energy Institute issued NEI 96-07, Revision 1, “Guidelines for 10 CFR 50.59 Implementation,” in November 2000, to aid the industry in developing the bases for determining if a license amendment request (LAR) was required for facility changes.

The NRC developed Regulatory Guide 1.187, “Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments, November 2000,” endorsing NEI 96-07, Revision 1, as a method that the staff considers acceptable for use in complying with the NRC regulations on the process by which licensees, under certain conditions, may make changes to their facilities and procedures as described in the UFSAR, and conduct tests or experiments not described in the UFSAR, without prior NRC approval. NRC did not provide any clarifications or exceptions to the methods and examples in the NEI 96-07, Revision 1, guidance.

## **DISCUSSION**

The main body of 10 CFR 50.59 is applicable for all SSCs. However, based on our discussions with the staff and representatives of NEI, we agree that expanded guidance for applying 10 CFR 50.59 to DI&C systems has been needed. There have been varying opinions on the interpretation of 10 CFR 50.59 requirements, when applying them to DI&C systems, as represented in submittals and discussions among the parties. These discrepancies have resulted from the inherently different failure characteristics of systems that include DI&C equipment and from the unique and far-reaching potential impacts of DI&C system common-cause events. The new guidance provided in NEI 96-07, Appendix D; Regulatory Guide 1.187, Revision 2; and RIS 2002-22, Supplement 1, “Clarification on Endorsement of NEI Guidance in Designing Digital Upgrades in I&C Systems,” should ensure that plant modifications performed by the licensee for DI&C systems or components without an LAR meet NRC expectations.

Both the RIS and NEI 96-07, Appendix D, are intended to assist licensees in the performance of 10 CFR 50.59 reviews of activities involving digital modifications. NEI 96-07, Appendix D, points to the RIS for guidance on qualitative evaluations and was submitted for endorsement by the NRC on January 19, 2019. NEI 96-07, Appendix D, is applicable to digital modifications involving safety-related and non-safety related systems and components and, also covers “digital-to-digital” activities. The RIS supplement is not directed towards DI&C replacements of the reactor protection system, the engineered safety features actuation system, or modification/replacement of the internal logic portions of these systems.

Draft Revision 2 to Regulatory Guide 1.187, endorses NEI 96-07, Appendix D, with exceptions and clarifications as providing an acceptable approach for the application of 10 CFR 50.59 guidance when conducting DI&C modifications.

There remains one area of disagreement between the NRC staff and NEI related to the interpretation of 10 CFR 50.59, Section (c)(2)(vi), "Create a possibility for a malfunction of an SSC important to safety with a different result than any previously evaluated in the UFSAR." The phrase 'different result' is interpreted differently by NRC staff and NEI. The staff lays out its objections to the NEI 96-07, Appendix D, interpretation, in Section C.2 of the Regulatory Guide, which should be revised for clarity. The essence of the staff position, based on rule language, is that 'a different result' means that the evaluation should determine the impact of the SSC malfunction anywhere in the UFSAR. NEI's position, based on language in the original Statement of Considerations to 10 CFR 50.59 and the definitions in NEI 96-07, is that 'a different result' means that the replacement SSC changes the results of a *safety analysis* in the UFSAR. To treat the 10 CFR 50.59 requirements fairly across plants with detailed UFSARs and those with less extensive UFSARs, NEI stated that a 'malfunction' is defined as failure to perform a design function; that although specific SSCs and their malfunctions may differ across individual plants, design functions do not; and, finally, that the replacement SSC should be evaluated based on the design functions it could affect, regardless of whether the SSC is specifically discussed in the safety analyses. This is an important concept that should be considered in the staff's approach as well. Draft Regulatory Guide 1.187, Revision 2, endorsing NEI 96-07, Appendix D, was issued for public comment on May 30, 2019, with the above issue unresolved.

The safety case for a nuclear power plant is made by the complete UFSAR, not the safety analyses alone. A different result anywhere in the UFSAR could alter the basis for licensing of the plant. If that possibility arises, an LAR is required so that the staff will evaluate the effect of the change and associated change in the basis for licensing.

Given the current rule, the NEI focus on only the safety analysis is too narrow. A malfunction of a modified SSC or performance characteristic could have a not so obvious effect on other systems, procedures, or operator response actions. The fundamental issue is "Does a change, modification, or component or system replacement result in a change in the licensing basis for the plant?" This cannot be determined without a more complete review of the licensing basis rather than just the safety analysis when potential modifications are being considered.

However, the staff should consider possible approaches to allow more flexibility in the application of 10 CFR 50.59. The staff's exception to NEI 96-07, Appendix D, requires consideration of more than the safety analysis within the UFSAR and thereby constrains its application. There is an opportunity for expanding the use of 10 CFR 50.59 for DI&C modifications by more clearly identifying the significance of different results caused by a malfunction of an SSC important to safety as specified in Criterion 6. The use of risk-informed or other methods should be considered. This is a longer-term issue and may require a rule change.

Sincerely,

/RA/

Peter Riccardella  
Chairman

## REFERENCES

1. Nuclear Energy Institute, NEI 96-07, "Guidelines for 10 CFR 50.59," Revision 1, November 17, 2000 (ML003771157)
2. Nuclear Energy Institute, NEI 96-07, Appendix B, "Guidelines for 10 CFR 72.48 Implementation," March 05, 2001 (ML010670023)
3. Nuclear Energy Institute, NEI 96-07, Appendix C, "Guideline for Implementation of Change Processes for New Nuclear Power Plants Licensed under 10 CFR Part 52," Revision 0, March 2014, (ML14091A739)
4. Nuclear Energy Institute, NEI 96-07, Appendix D, Supplemental Guidance for Application of 10 CFR 50.59 to Digital Modifications," Revision 0, November 2018 (ML18338A389)
5. U.S. Nuclear Regulatory Commission, Letter to NEI documenting staff comments on NEI 96-07, Appendix D, December 20, 2018 (ML18340A124)
6. U.S. Nuclear Regulatory Commission, Regulatory Issue Summary (RIS) 2002-22, Supplement 1, "Clarification on Endorsement of NEI Guidance in Designing Digital Upgrades in I&C Systems," Revision 1, May 31, 2018 (ML18143B633)
7. U.S. Nuclear Regulatory Commission, NRC Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59 Changes, Tests, and Experiments," Revision 0, November 2000 (ML003759710)
8. U.S. Nuclear Regulatory Commission, NRC Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59 Changes, Tests, and Experiments," Draft Revision 2, Draft Guide DG-1356, May 2019 (ML19045A435)

June 20, 2019

SUBJECT: REVIEW OF NUCLEAR ENERGY INSTITUTE (NEI) 96-07, APPENDIX D, "SUPPLEMENTAL GUIDANCE FOR APPLICATION OF 10 CFR 50.59 TO DIGITAL MODIFICATIONS," DATED NOVEMBER 2018, AND THE NRC'S ASSOCIATED DRAFT REVISION 2 TO REGULATORY GUIDE 1.187, "GUIDANCE FOR IMPLEMENTATION OF 10 CFR 50.59 CHANGES, TESTS AND EXPERIMENTS"

Accession No: ML19171A323      Publicly Available Y      Sensitive N  
Viewing Rights:  NRC Users or  ACRS Only or  See Restricted distribution \*via email

OFFICE	ACRS/TSB	SUNSI Review	ACRS/TSB	ACRS	ACRS
NAME	KWeaver ( <i>LBurkhart for</i> )	KWeaver ( <i>LBurkhart for</i> )	LBurkhart	AVeil	PRiccardella ( <i>AVeil for</i> )
DATE	6/20/2019	6/20/2019	6/20/2019	6/20/2019	6/20/2019

OFFICIAL RECORD COPY