

NEI 96-07, Appendix D, Supplemental Guidance for Application of 10 CFR 50.59 to Digital Modifications

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Meeting on the U.S. NRC Staff perspectives on Appendix D of
NEI 96-07

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TODAY'S OBJECTIVES

- Identify **WHAT** subject areas have been included in NEI 96-07, Appendix D
- Explain **WHY** the subject areas were included in NEI 96-07, Appendix D

NOT TODAY'S OBJECTIVES

- Technical items (e.g., CCF, CCF Susceptibility Analyses)
- EPRI document 3002005326

NEW TERMINOLOGY

- Screen Phase
 - *Variety* (the Licensing-focused equivalent to the technical term *Diversity*)
 - *Layers of Design* (the Licensing-focused equivalent to the technical term *Defense in Depth*)
- Evaluation Phase
 - *CCF Unlikely* (i.e., below the threshold for consideration in the Licensing Basis/50.59)
 - *CCF Not Unlikely* (i.e., above the threshold for consideration in the Licensing Basis/50.59)

APPENDIX D “GOALS”

Address NRC Concerns

“Translation” of NRC Concerns

- Licensees are not identifying the pertinent UFSAR descriptions that apply to digital modifications.
- Licensees are not adequately documenting the justifications for 10 CFR 50.59 conclusions.

APPENDIX D “GOALS”

Provide 10 CFR 50.59 Guidance

Licensee Weaknesses

- Licensees do not consistently identify the pertinent UFSAR descriptions that apply to digital modifications.
- Licensees do not consistently document the justifications for 10 CFR 50.59 conclusions adequately.

APPENDIX D

Overview

- Screen Guidance Focus Areas
 - Combination of Components and/or Functions
 - Coping Analyses
 - Dependability
- Evaluation Guidance Focus Areas
 - Malfunction Likelihood (Criterion #2)
 - Creation of New Accidents (Criterion #5)
 - Malfunction Results (Criterion #6)

SCREEN GUIDANCE

Appendix D – Section 3

Introduction

- Not all activities involving digital modifications will be **ADVERSE**, such as...
 - Activities that do not involve multiple applications of the same hardware and/or software
 - Activities that do not involve the combination of components and/or functions
- Digital modifications will not be classified as “fundamental changes to how a design function is performed or controlled.”

SCREEN GUIDANCE

Appendix D – Section 3

Combination of Components/Functions

- Only when a combination of components and/or functions causes the creation of a new malfunction would the activity involving a digital modification be **ADVERSE**.
- Only if a UFSAR identifies separate components and/or functions as providing a level of physical and/or functional variety and/or layers of design that were considered in the licensing process would the activity involving a digital modification be **ADVERSE**.

SCREEN GUIDANCE

Appendix D – Section 3

Coping Analyses

- Appendix D, Definition 2.4, Coping Analysis:
An analysis that shows whether the mitigative measures are adequate to manage the undesirable effects of a failure (or misbehavior or CCF), assuming the measures that are in place to prevent the failure are not effective.
- Types of Coping Analyses
 - Non-numerical – Modifying how an SSC will be designed or how the facility will be operated
 - Numerical – Re-running a safety analysis

SCREEN GUIDANCE

Appendix D – Section 3

Dependability

- Tools to Address Dependability
 - Design Measures
 - Development Process, Testability, V&V and Configuration Management
 - Operating History
- Features of Highly Dependable Designs
 - Internal Redundancy/Fault Tolerance
 - Self-Diagnostics and Self-Test
 - Preventive Measures
 - “High Demand” System Performance
 - Operator Alerts

EVALUATION GUIDANCE

Appendix D – Section 4

Eight 10 CFR 50.59(c)(2) Criteria

4.1 – No unique digital guidance needed

4.2 – Digital-specific guidance provided

4.3 – No unique digital guidance needed

4.4 – No unique digital guidance needed

4.5 – Digital-specific guidance provided

4.6 – Digital-specific guidance provided

4.7 – No unique digital guidance needed

4.8 – No unique digital guidance needed

SECTION 4.2 – Malfunction Likelihood

- Topics Discussed
 - UFSAR Level of Detail
 - Hazard Analysis
 - CCF Considerations
- CCF Considerations
 - CCF Susceptibility Analysis Result
 - CCF Unlikely (i.e., not as likely as malfunctions already considered in the licensing basis)
 - CCF Not Unlikely (i.e., as likely as malfunctions already considered in the licensing basis)
 - Application of the “Qualitative” Approach (i.e., discernible or not discernible increase in the likelihood of a malfunction)

SECTION 4.5 – Different Accident

- Topics Discussed
 - CCF Considerations
 - Initiation of Multiple Accidents
- CCF Considerations (CCF Susceptibility Analysis Result)
 - CCF Unlikely = **Not Credible, no different accidents possible**
 - CCF Not Unlikely = **Credible**, but is the accident **bounded**
 - Bounded = **Not a Different Accident**
 - Not Bounded = **Different Accident**

SECTION 4.6 – Different Result

- Topics Discussed (same as 4.2)
 - UFSAR Level of Detail
 - CCF Considerations
- CCF Considerations (CCF Susceptibility Analysis Result)
 - CCF Unlikely = **Not Credible, no different results possible**
 - CCF Not Unlikely = **Credible**, but is the result **bounded**
 - Bounded = **Not a Different Result**
 - Not Bounded = **Different Result**

QUESTIONS

