

Concerns 5, 7 & 9 on D3 Analysis from NRC Nov. 5, 2013 letter to NEI

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NEI 01-01 Focus Team

Meeting on NEI 01-01

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Purpose of NEI 01-01 Focus Team

- The NEI 01-01 Focus Team will ensure clear criteria, scope & guidance exist for application of 10 CFR 50.59 to DI&C activities that allow licensees to maintain (and improve) margins of safety by efficiently managing obsolescence.

Big Picture Issues with DI&C Activities

- Divided into
 - Process Issues
 - Support Issues
 - Technical Issues
- Today we will discuss Comments 5, 7, and 9 from 20131105 NRC letter to Mr. Anthony Pietrangelo, NEI (ML13298A787)

Diversity and Defense in Depth Analysis

- A diversity and defense in depth (D3) analysis consists of two parts
 1. CCF susceptibility analysis
 2. CCF coping analysis (only completed if susceptible to CCF per part 1)

Specific Issue with DI&C Activities

- There are cases where industry has improperly made the assumption CCF can be eliminated for digital system changes in safety-related systems, or those non-safety systems described in the UFSAR, without a software CCF susceptibility analysis.
- We will perform a software CCF susceptibility analysis on these digital changes and then use the results of that analysis in the 50.59 process.
- We recognize the need to develop standard industry guidance on software CCF susceptibility analysis and software CCF coping analysis distinctly for safety and non-safety systems.

Comment #5 of NRC letter

- *NRC maintains that NEI 01-01, Sec. 3.2.2 does not include design criteria for performance of a D3 analysis, and some have interpreted that a D3 analysis is only required for a “system upgrade” as opposed to multiple “component digitization.” Additional guidance is needed in this area.*
- Digital design changes within RPS/ESFAS components require a software CCF susceptibility analysis which, in the case where CCF cannot be eliminated will require a formal CCF coping analysis. Therefore, the appropriate parts of a D3 analysis will be conducted.
- NEI 01-01, Section 3.2.2 discusses the uniquely digital impact on independence, software common cause failures, and does not address the criteria for performing the CCF coping analysis, but this is not the purpose of Section 3.2.2.
- **Bottom line:** The industry recognizes the need to develop guidance for performing software CCF susceptibility analysis for digital changes to safety related and non-safety related systems described in the UFSAR. The results of which would dictate the need for CCF coping analysis. NEI 01-01 may not be the best place for this guidance.

Comment #7 of NRC letter

- *NEI 01-01, Section 4.3.2, “Software Considerations,” states:*

“for some upgrades the likelihood of failure due to software may be judged to be no greater than the failure due to other causes, i.e., comparable to hardware common cause failure. In such a case, even when it effects redundant systems, the digital upgrade would screen out.”

This conclusion is not correct...because diversity would be reduced due to a single software entity.

- Digital design changes within RPS/ESFAS components require a software CCF susceptibility analysis. Therefore, the appropriate part of a D3 analysis will be conducted.
- However, the software CCF susceptibility analysis does not pre-determine that a software CCF is applicable and, in this case for simple digital devices or components, may not have any adverse impact and would screen out.
- **Bottom line:** The industry recognizes the need to develop guidance for performing software CCF susceptibility analysis for digital changes to safety related and non-safety related systems described in the UFSAR. The results of which would dictate the need for CCF coping analysis. NEI 01-01 may not be the best place for this guidance.

Comment #9 of NRC letter

- *In NEI 01-01, Sec. 4.1 and 4.2, as well as in Figure 4-2, there is an implication that if software common cause failure can be shown to be sufficiently unlikely then a D3 analysis need not be performed. This implied logic is not correct.*
- Digital design changes within RPS/ESFAS components require a software CCF susceptibility analysis which, in the case where CCF cannot be eliminated will require a CCF coping analysis. Therefore, the appropriate parts of a D3 analysis will be conducted.
- **Bottom Line:** The industry recognizes the need to develop guidance for performing software CCF susceptibility analysis for digital changes to safety related and non-safety related systems described in the UFSAR, which would feed the requirement for CCF coping analysis. NEI 01-01 may not be the best place for this design guidance.