

**From:** Robert Daley  
**To:** Mark Salley; Phil Qualls  
**Date:** Fri, Aug 15, 2003 1:46 PM  
**Subject:** Region III comments on NEI 00-01

Phil, Mark,

I was asked by Julio Lara to perform our review of NEI 00-01. Attached are my comments on NEI 00-01. They're fairly extensive, so if you have any questions, feel free to call me.

Thanx!

Bob Daley

**CC:** Julio Lara; Sunil Weerakkody

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## Comments on NEI 00-01

### Bob Daley (Region III)

**General Comment** - I think that NEI 00-01 is usable and does contain some very interesting and useful information. The overall concept appears to be something that we (the NRC) can work with.

With that statement made, I also want to say that the document contains many inconsistencies within itself. After reading many sections (primarily sections 1 thru 4) several times, it is still unclear to me what the overall scope of circuit applications that the risk methodology in Section 4 can be applied to, if NEI 00-01 were to be used. It also appears that if certain statements in the document remain, rulemaking will have to occur prior to our endorsement, because several items in NEI 00-01 are clearly contrary to Appendix R, III.G. However, I think that these issues can probably be cleared up through working level meetings with the industry.

I included specific comments below. I concentrated on the most important sections of the document, sometimes reading those sections several times. However, because of limited time availability for review, some sections were merely scanned. -In short, there may be more items that require "fixing" in the document, but I did not find those items, because my review was limited by time constraints. Also, I had a list of NRR's comments on NEI 00-01, so I tried not to duplicate - unless, that is, the item was so crucial that duplication seemed necessary.

### Executive Summary and Section 1

1. **Executive Summary** - states, *"It is expected that plants adopting an alternate risk-informed licensing basis using NFPA 805 will be able to reference NEI 00-01 as an acceptable method for addressing circuit failure issues. Plants maintaining their existing deterministic licensing basis should also be able to utilize NEI 00-01 for this purpose, subject to NRC approval through a regulatory guide or rulemaking."*

These sentences are hand-in-hand and could be made to imply (in the future) that the intent was to allow a deterministic "out" when applying NFPA 805. The deterministic methodology in NFPA 805 is much more restrictive than in NEI 00-01. I don't think that we want the industry mixing and meshing deterministic methodologies, because they will always default to the methods in NEI 00-01, which will take out much of the "bite" in NFPA 805.

2. **Section 1.1.1, Page 4** - states, *". . . In this example, a licensee discovers an oversight in the implementation of its own licensing basis, and has failed to postulate a spurious actuation where one should have been postulated. The licensee can determine the significance of the issue using the methods of NEI 00-01, the revised fire protection Significance Determination Process, or other plant-specific risk analyses. The licensee would place the issue in the plant Corrective Action Program (CAP) if it is significant*

*according to the NEI 00-01 criteria, or request an exemption or deviation, or change the fire protection plan, if it is not. Normal reporting guidelines would be followed."*

Allowing a potential single spurious operation to go unmitigated based upon risk based methodology is clearly contrary to the requirements in Appendix R, III.G. If this stays in NEI 00-01, rulemaking would have to occur prior to endorsement of the doctrine.

What's peculiar about this example is that it appears to be inconsistent with the risk based methodology presented in Section 4 of the guidelines. From the guidance in Section 4, it seems clear that using risk is pretty much limited to "component combinations," ie. it's applied to multiple simultaneous spurious operations. This statement applies the guidance to single spurious. If I had to guess, different people wrote the different portions of this document, and without a decent technical review, the document now contains several different "visions" for success.

3. **Section 1.1.2, page 4** - states, *"The deterministic and probabilistic methods outlined in Sections 3 and 4 can also be used to determine the safety significance of identified issues such as multiple spurious signals/operations, and the potential for fire-induced circuit failure modes described in NRC IN 92-18 (Reference 6.3.37). As noted above, these issues are considered to be outside the licensing basis of many plants."*

Again, since the risk based methodology contained in Section 4 is based upon "component combinations," it should not apply to IN 92-18 since this IN described an effect caused by a single spurious actuation.

I'm not sure, but it appears that there is a thought that this document can be applied to any circuit issue that falls outside the plant's licensing basis. If that's so, we better all have a consistent interpretation of what "outside the license basis" means. However, the guidance in Section 4 appears to be pointed to combined simultaneous component impacts. So, if any circuit issue outside the license basis were to be considered to be encompassed within the risk based guidance in NEI 00-01, then I think that the applicability of Section 4 would be tested constantly by each new issue.

What I am saying is that it is impossible to determine whether the risk based methodologies in this document would apply and be "safe" when applied to every "outside of license basis" issue that comes up. Therefore, I think that the document should limit itself to the issues that are already on the table. Then, as new issues arise, NRR and the Regions together can determine whether NEI 00-01 should apply, and whether NEI 00-01 provides an acceptably safe approach for that specific issue.

## Section 2

4. **Section 2.1, Page 16** - states, *"Section III.G.1 establishes the requirement to ensure that adequate fire protection features exist to assure that one train of systems necessary to achieve and maintain hot shutdown is free of fire damage. The term free of fire damage allows the operator to perform a manual action on safe shutdown equipment to accomplish its required safe shutdown function, in the event the remote/automatic function of the equipment is impacted."*

While I believe this to be the way that the industry as a whole interprets III.G.1, this is not the position of the NRR staff. Allowing manual actions "in accordance with III.G.1" is not an accepted position by the staff.

5. **Section 2.1, Page 17** - states, ". . . where redundant trains of systems necessary to achieve hit shutdown are located in the same fire area and manual operation of the required components is not achievable, provide fire protection features consistent with the requirements of Section III.G.2.a, b, or c . . . "

See comments under Item No. 3.

### Section 3

6. **Section 3.1.1.5, Page 23** - states, "Compliance to the separation requirements of Sections III.G.1 and III.G.2 may be supplemented by the use of manual actions, repairs (cold shutdown only), exemptions, deviations, GL 86-10 fire hazards analyses or fire protection design change evaluations, as appropriate."

Use of manual actions - again, see comments under Item No. 3.

7. **Section 3.5.1.1, Page 47** - states, "Consider the three types of circuit failures identified above to occur individually on each conductor of each safe shutdown cable on the required safe shutdown path in the fire area. For failures within the licensing basis, evaluate the effects of each of these types of circuit failures on each conductor one at a time. For failures outside the licensing basis, evaluate component combinations as identified through the analysis methods in Section 4 of this document."

This is the "home run," the "big enchillada." This paragraph is the single most important concept that we, the agency, and the industry need to come to some type of closure over.

This paragraph states - although it is almost hidden in the verbage - that from a deterministic view, only a single hot short, or a single open, or a single ground, needs to be postulated at one time. Anything more than this is outside the license basis and would be determined probabilistically. How that would be done is indeterminate, because there is no clear probabilistic number for a hot short or a ground. Section 4 of this documents talk about "component combinations," which I think is another term for multiple simultaneous spurious operations. One hot short may or may not cause one spurious operation. NEI 00-01 is very inconsistent in how it handles these concepts. It needs to be clearer!

I don't think that we can accept this as written for no other reason than it is absurd to postulate that only one ground will occur at one time during a fire. This is technically unsound and contrary to the regulatory concept of "fire damage." However, I do think that an acceptable compromise can be reached by employing the concept of "any and all, one at a time, with a mitigating action." This would allow the industry to take one

spurious operation of a piece of equipment at one time. As long as there were a mitigating action (This could be many different things.) assigned to the spurious operation, a simultaneous spurious operation would not need to be considered. Also, the concept of unlimited "fire damage" in the affected area would remain intact.

I think it is important that we get away from the "secondary component" failure mechanisms of the hot short, open, and short-to-ground and stick to the bigger picture concepts of "primary component" failure mechanisms which consist of "fire damage" and "spurious operations." If we assume these bigger picture failure mechanisms, it is irrelevant how many hot shorts occur in a given "primary component."

I also believe that the majority of the industry will go along with this, because the vast majority of licensees comply with this. It is also a technically reasonable starting point.

## Section 4

### 8. Section 4.1, Page 60

It appears that the probabilistic assessments described in Section 4 only apply to spurious actuations, since Section 4.1 puts everything in the context of a spurious actuation. "Fire damage" does not appear to be addressed. This implies that component failures (not spurious actuations) should be covered under the deterministic portion of the document (Section 3).

Additionally, throughout section 4, the term "component combinations" is used. I believe that what the industry is doing for this entire section is trying to resolve the issue of simultaneous "combined equipment impacts" with risk informed methodology. Is this true?

If this is true, then the crux of this document is as follows:

Only adverse scenarios that require more than one spurious operation to develop are evaluated using the risk methodology in Section 4. Any other adverse scenarios, caused by either "fire damage" or a single spurious actuation should be dispositioned using the deterministic methodology in Section 3.

If this is the bottom line, then I think that the approach is probably a good one. However, as already stated in my comments for Section 1 of the document, NEI 00-01 appears to be inconsistent in that Section 1 appears to try to apply the methodology presented in Section 4 to "single spurious actuations" and anything "outside the license basis."

### 9. Table 4-2, page 65

This table states that fire frequency is dependent on the fire frequency of an entire fire area. Considering that even in SDP space, when risk is assigned to a finding, we look at the "area" within the fire area that is affected to assign a fire ignition frequency. It doesn't seem consistent to only look at an area in its entirety when assigning fire

frequency, when the cabling affected may be only in a small portion of the fire area. Additionally, that small portion of the fire area may have a much higher fire frequency than the fire area taken as a whole.

10. **Table 4-3, page 67, Detection and Manual Suppression** - states, *"This can be demonstrated if the fire area is covered by area-wide (or over the major ignition sources) early warning detection system . . ."*

Allowing detection only over "major ignition sources" is not in accordance with III.G. Even though this section only applies to simultaneous component combinations, I think that we should have some semblance of consistency. Additionally, even if we were to allow this for the screening criteria, we would need a very definite definition of the term "major ignition source."

11. **Section 4.4.3, "Documentation," page 89** - states, *"The accurate and comprehensive documentation of this assessment will be prepared and maintained as a retrievable plant record following established practices. These practices will generally not be 10 CFR 50 Appendix B criteria, by good plant practices. The documentation should be maintained in accordance with existing plant procedures."*

This essentially means that for some of the analyses, no documentation may exist at all. This appears to be unacceptable. It would have to be accessible during an inspection. I suggest that these risk assessments as a minimum be documented and readily auditable. They should also be made a part of the plant's Fire Protection Program similar to deviations, "Adverse to Safe Shutdown" evaluations, etc.

## Appendix D

12. **Appendix D, Section D.2, page D-1** - states, *"Manual actions may be utilized for either redundant or alternative/dedicated shutdown capability and do not form the basis for determining which capability is being utilized."*

The last interpretation of this out of Washington was that manual actions were not allowed for III.G.2 and redundant safe shutdown methodologies. This statement is contrary to that interpretation.

13. **Appendix D, Section D.5, page D-10** - states, *"Areas where alternative/dedicated shutdown is credited must have fixed (automatic) suppression and detection."*

Automatic suppression is not required per III.G.3

14. **Appendix D, Section D.6, page D-11** - states, *"Although not credited without prior NRC approval, additional operator actions could be useful . . ."*

NRC approval is not required if a valid "Adverse to Safe Shutdown" evaluation has been performed showing that the addition of the manual action does not adversely affect safe shutdown.

