

From: "Emerson, Frederick (GE Infra, Energy)" <frederick.emerson@ge.com>
To: <nrcprep@nrc.gov>
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Subject: Comments on Proposed Generic Communication, Post-Fire Safe-Shutdown Circuit Analysis, 70 FR 60859

General Electric comments on the subject generic communication. Please contact Mr. Quintana or me (as noted in the attached letter) with any questions.

Fred Emerson
GE Energy Nuclear
BWROG Project Manager
T 910 675 5615
F 910 362 5615
C 910 547 2663
D *292-5615
E frederick.emerson@ge.com <mailto:frederick.emerson@ge.com>
www.gepower.com

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GE ENERGY

Louis M. Quintana
Manager, Licensing

P.O. Box 780, M/C A-30
Wilmington, NC 28401
USA

T 910.675.6616
F 910.362.6616
Louis.Quintana@ge.com

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Chief, Rules and Directives Branch
Division of Administrative Services
Office of Administration
U.S. Nuclear Regulatory Commission
Mail Stop T6-D59
Washington, DC 20555-0001

SUBJECT: Comments on Proposed Generic Communication, *Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations*, 70 FR 60859

Dear Mr. Lesar:

We appreciate the opportunity to provide comments on the proposed generic letter related to compliance with existing regulations related to post-fire safe shutdown circuit analysis. This is an area of long-standing disagreement between the industry and NRC staff. After a period of progress in achieving a better understanding of the issue and identifying reasonable methods for addressing it, the proposed generic letter would be a significant step backward. The NRC proposal will only lead to the expenditure of considerable and unnecessary resources by both staff and industry without significant improvement in safety. We discuss our general concerns below and provide comments on a number of FRN errors or oversights in the enclosure.

Impact of the Proposed Generic Letter

The proposed generic letter intends that licensees review their post-fire safe shutdown circuit analysis programs to determine compliance with the NRC interpretation of requirements for circuit analysis stated in the generic letter to gather information from licensees. If licensees determine that they are not in compliance, they are to assess the functionality of SSCs to achieve and maintain safe shutdown, describe compensatory measures, and discuss plans for plant modifications and licensing basis changes.

The proposed generic letter states a specific interpretation of regulations and regulatory guidance related to multiple spurious actuations, namely, that licensees must consider and design for all possible multiple simultaneous spurious actuations in a fire area to be in compliance. The requirement to consider all possible multiple spurious actuations is inconsistent with the current regulatory requirements, impractical in terms of being able to identify the required scope of review, costly in terms of the effort involved in even attempting such a task, and unnecessary in its apparent lack of significant risk and safety benefit.

The possible alternative consequences of the NRC positions in this proposed generic letter include:

- Revision of existing post-fire safe shutdown circuit analyses that currently provide an acceptable degree of protection. The cost of these circuit re-analyses would be in the millions of dollars. The results of the re-analyses will be manifest in either modifications or requests for exemptions.

One licensee has estimated that the physical plant changes necessary to provide compliance with these new requirements could run into many millions of dollars and require five years to fully implement, or hundreds to thousands of costly exemptions or deviations to address alternative means of compliance. While the impact would vary from plant to plant, we believe this impact would be typical of that for many plants.

- Adopting a risk-informed approach to circuit analysis that involves the adoption of an alternative fire protection licensing basis (NFPA 805). This will require development of a fire PRA and performance of a thorough examination of the existing fire protection licensing basis (including circuit analyses) involving millions of dollars and several years of effort.

Because the positions in this proposed generic letter would have a major and unnecessary impact on both the licensees and the NRC, we recommend that it be withdrawn. A better approach is to evaluate the risk significance of current circuit analysis practices using risk-informed approaches, as the NRC is doing with inspections and licensees are doing with self-assessments. If specific areas are identified as potentially risk significant, they should be addressed through corrective action programs. These approaches constitute more effective means of determining compliance and identifying any safety issues inherent in current circuit analyses.

Use of Experimental Evidence to Redefine Plant Licensing Bases

The NRC states in several places in the FRN (70 FR 60859),

- “...the cable functionality fire testing demonstrated that multiple spurious actuations can occur.... Therefore, if a licensee does not account for multiple spurious actuations in their circuits analysis, they are not in compliance....”
- “Based on the new information provided by the EPRI/NEI cable fire tests, approved fire protection programs that do not include protection against possible multiple spurious actuations.....may not comply with these regulatory requirements.”
- “The 2001 EPRI/NEI fire tests clearly showed.... Consequently, to demonstrate compliance.....”
- “New information from the ...tests has shown that multiple, simultaneous spurious actuations must be considered for licensees to be in compliance....”

Compliance with the circuit failure regulations is defined by plant-specific licensing bases built up over many years, not by new experimental evidence. Plants for the last 20+ years defined their licensing bases from regulations, regulatory guidance, and docketed positions accepted by NRC. To now use experimental evidence to justify a regulatory interpretation of compliance seems a misapplication of the backfit rule, 10 CFR 50.109. In addition, the enclosure to this letter provides an alternative view of the industry cable testing results that supports the current industry approach to post-fire safe shutdown circuit analysis.

The “Backfit Discussion” in the FRN concludes that the information requested by the proposed Generic Letter is considered a compliance exception to the backfit rule, in accordance with 10 CFR 50.109(a)(4)(i). This portion of 10 CFR 50.109 states,

“(4) The provisions of paragraphs (a)(2) and (a)(3) of this section are inapplicable and, therefore, backfit analysis is not required and the standards in paragraph (a)(3) of this section do not apply where the Commission or staff, as appropriate, finds and declares, with appropriate documented evaluation for its finding, either:

- (i) That a modification is necessary to bring a facility into compliance with a license or the rules or orders of the Commission, or into conformance with written commitments by the licensee....”*

Because of the high resource impacts of this regulatory position on licensees, it would be reasonable to expect that the NRC would, as part of its “appropriate documented evidence for its finding,” provide some supporting evidence that the test results indicate a significant safety issue, especially in a risk-informed environment, that is not addressed by the current licensing basis. The NRC does not provide documented evidence that its interpretation of multiple spurious actuations constitutes a safety issue, only that they are possible. In fact, as noted above, licensees who have evaluated the risk impact of potential multiple spurious actuations have determined that they are generally of extremely low safety significance. Therefore, the NRC has not provided appropriate documented evidence for the finding that application of the backfit rule is not necessary here.

In conclusion, the proposed generic letter imposes a significant and unnecessary burden on licensees with little, if any, definitive safety benefit. To assure compliance with existing regulations and identify potential safety issues we recommend the NRC continue its risk-informed inspection approach to circuit failures, and for licensees to perform risk-informed self-assessments of circuit failures (as outlined in NEI 04-06) to pinpoint potential safety concerns.

If you have any questions about these comments, please contact me at 910-675-6616 or Fred Emerson at 910-675-5615.

Sincerely,



Louis M. Quintana
Manager, Licensing

Project No. 691

Enclosure: Specific Comments on “Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations” (70 FR 60859)

cc: NRC Document Control Desk
Gary Holahan, NRR
James Lyons, NRR
Sunil Weerakkody, NRR
BWROG Primary Representatives

Enclosure

Specific Comments on "Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations" (70 FR 60859)

1. The FRN states that the EPRI cable fire tests showed a high probability of spurious actuations. Although this is partially true, it is an incomplete assessment of the test results. What is actually true of the tests is that they showed a relatively high probability of spurious actuations given that the cable was actually damaged by fire. Fire damage for those cables most commonly used in the industry (having thermoset insulating material) did not occur until the cable temperature reached very high temperatures. For the tests performed, cable temperatures generally did not reach this level for at least 30 minutes. Additionally, once the hot shorts did occur, their duration was generally very brief and they ended with a short to ground.

Applying these facts about the tests results to a typical BWR yields the following results:

- **Typical BWR Configuration:** BWR Reactor Buildings are typically constructed with high ceilings and with suppression systems in those plant areas where a combustible threat exists. BWRs are also constructed with a level of divisional separation consistent with the requirements of Regulatory Guide 1.75. Additionally, as a result of numerous plant changes over the last 20 to 25 years resulting from current regulatory requirements, adequate separation or protection of redundant post-fire safe shutdown trains exists in all plant areas as reviewed by NRC inspections.
- **Typical BWR Current Circuit Analysis Approach:** With respect to the current post-fire safe shutdown circuit analysis used at a typical BWR, multiple spurious actuations have already been addressed. This is true since BWRs, as was outlined in the Guidance Document for Post-Fire Safe Shutdown Analysis submitted to the NRC in 1999, have evaluated each conductor in each safe shutdown circuit for the effects of a hot short, a short-to-ground or an open circuit. Each of these effects is addressed on an individual basis. The difference between the industry approach and the NRC's current position in the proposed generic letter is that the industry does not address the combination of the effects.
- **Alternative Assessment of Test Results on a Typical BWR:**

For a typical BWR with high ceilings and suppression installed, fire temperatures at the location of safe shutdown circuits would not be expected to exceed 175° F without actuating the installed suppression systems. Therefore, widespread circuit damage would not be expected. For areas without suppression, the fire threat is considered to be low enough that widespread circuit damage would not be expected.

Therefore, the expected fire damage would be localized and incapable of generating sufficient heat to damage installed cables. As a measure of defense-in-depth, the current approach to post-fire safe shutdown would have addressed the effects of any impacts individually, regardless of the limited likelihood of actual occurrence. In the event that two circuits with the potential to act in combination in a way that could

lead to an undesirable and unrecoverable condition were installed in the same fire area, the likelihood of them both spuriously actuating as a result of the same fire is low. Even if fire spread were to occur between the two circuits, there would be sufficient time for response by the site fire brigade and for mitigative actions in accordance with established procedures.

Therefore, when results are applied in the context of an actual plant environment, the tests support our view that the circuit analysis assumptions currently employed by a typical BWR are adequate to provide a low level of plant risk. Recent PRA evaluations of the risk impact of such combinations generally confirm this.

2. NRC discounts the industry position on "one-at-a-time," as stated in an NEI letter of May 30, 1997, based on a position stated in a 1982 NRC letter from Dennis Crutchfield to P.B. Fiedler. First, an NRC letter to a licensee is not an appropriate mechanism for conveying a staff position of generic applicability. Second, this justification was not made widely known until the publication of the current FRN (70 FR 60859).

In addition, the NRC states that the May 30, 1997, NEI letter offered no assessment of the safety significance of multiple sequential and cumulative failures to support its contention that such failures were low significance. This is true, but pilot PRA studies performed later did demonstrate that such failures were of low significance, as noted above.

3. NRC indicates that a licensee could address the compliance issue by using a risk-informed approach to justify an exemption using the guidelines of Regulatory Guide 1.174. Unfortunately, most licensees would have to request not one, but many exemptions to address specific combinations of circuit failures. This use of risk-informed exemption requests to address many low significance "compliance" issues, multiplied by numerous licensees, creates an extremely burdensome process for NRC and industry staff alike, and has no apparent safety benefit. The alternative is adopting NFPA 805, a costly step in its own right.

As indicated in the text of the letter, it is far more cost-effective for the industry to perform risk-informed self-assessments and the NRC to continue its practice of risk-informed inspections. This will focus staff and industry resources on addressing any circuit failure combinations that are risk significant, rather than forcing repeated consideration of risk-insignificant circuit failure combinations.