

Briefing of the Committee to Review Generic Requirements Generic Letter "Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations"

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Purpose of the Briefing

- Provide the CRGR with a summary of the issue addressed in the Generic Letter (GL) and how it supports the closure path for post-fire safe-shutdown circuit issues.
- Provide a summary of public comments on the GL related to possible backfit implications and describe the staff resolution of those comments.
- Obtain CRGR approval to issue the GL.

Measure of Success

- CRGR approves issuance of the GL.

Outline

- Purpose of Issuing the GL
- Requested Information from Licensees
- Background since 1997
- Basis for GL
- Issue Clarified in GL
- Industry Comments and Staff Resolutions Concerning Backfitting
- Why Licensees Believe that the GL Imposes Undue Burden
- Why the Staff Believes that the Burden Imposed by the GL is Justified
- Summary of Burden to Licensees to Respond to GL
- Summary

A-1

Purpose of Issuing the GL

- Respond to Agency's need to provide clarification and closure of outstanding fire protection issues.
- Respond to licensees' request to provide clarification of regulatory expectations.
- Respond to Regions' request to provide clarification of regulatory expectations for circuit inspections (resumed January 2005).
- Clarify how the NEI/EPRI cable fire test program re-affirms long-held regulatory positions.
- Provide part of the foundation for licensees planning to transition to NFPA 805.

Requested Information from Licensees

- Within 90 days, evaluate licensing basis and information in GL regarding multiple spurious post-fire safe-shutdown circuit analyses. Conclude whether the NPP is in compliance with regulatory requirements.
 - If not in compliance, submit functionality assessment of affected SSCs.
 - If not in compliance, submit description of compensatory measures put in place.
- Within 6 months, submit the plan to return all affected SSCs to compliance with regulatory requirements (plant mods, license amendments/exemption requests, etc.).
- Within 30 days, provide notification if cannot meet requested completion date (state why and proposed schedule/course of action).

Background Since 1997

- Multiple LERs brought lack of consensus concerning circuits to the staff's attention, which led to a moratorium on inspection of circuit issues (1997).
- NEI/EPRI cable fire tests demonstrated that multiple spurious actuations can occur and that they can occur in rapid succession without sufficient time for mitigation. Therefore, if a licensee does not account for multiple spurious actuations in its circuits analysis, the licensee may not be in compliance with 10 CFR 50.48 and 10 CFR Part 50, Appendix A, GDC 3, which require that a licensee provide and maintain free of fire damage one train of systems necessary to achieve and maintain safe shutdown (2001).
- Developed risk-informed approach to inspections to focus on risk-significant configurations (based on cable fire tests) (RIS 2004-003).
- Held public meeting in Atlanta to discuss staff positions and solicit stakeholder feedback (2004).
- Worked with NEI to finalize an acceptable industry guidance document for circuit analysis (NEI 00-01) (2005).
- Issued RIS 2005-30 to clarify regulatory requirements for circuit analyses. Addresses "associated circuits," "any-and-all," and emergency control stations.
- Initiated GL to clarify regulatory requirements for circuit analyses (2005) - Addresses "one-at-a-time."

Basis for GL

- Review of NRC regulations, generic communications, correspondence, etc., related to this issue (references are identified in GL).
- OGC has no legal objections to the GL .
- Results of NEI/EPRI cable fire test program (prior to the 2001 NEI/EPRI cable fire testing, very little information was available regarding circuit failure during a fire, which made enforcement of NRC regulations in that area difficult).
- Input from inspectors on issues that need to be addressed.

Issue Clarified in GL

"One-At-A-Time" Spurious Actuations

- Some licensees claimed that only a single spurious actuation must be assumed in circuit analyses based on a misinterpretation of GL 86-10 response to question 5.3.10.
- Some licensees claimed that multiple spurious actuations occur "one-at-a-time," with sufficient time between actuations to take mitigating actions.
- The NRC letter from Sam Collins to NEI on March 11, 1997, stated that multiple spurious actuations caused by fire-induced hot shorts must be considered and evaluated (ML003716454).
- Byron and Braidwood have SERs approving assumption of a single spurious actuation per fire event (If staff position is applied to them, it would be a compliance backfit).
- The GL clarifies the regulatory requirement that multiple spurious actuations must be considered and evaluated.
- The staff position on associated circuits presented in this GL is consistent with Section 9.5.1 of the SRP.

Industry Comments and Staff Resolutions Concerning Backfitting

The following is a summary of the comments and resolutions related to backfitting:

- **Comment:** NRC is using a generic communication to change the plant licensing basis. NRC has determined that the information requested is a compliance exception in accordance with 10 CFR 50.109(a)(4)(i).

NRC Management Directive 8.4, "Management of Facility-Specific Backfitting and Information Collection," states the following objective regarding backfits: "To ensure that NRC-licensed facilities provide adequate protection of the public health and safety and common defense and security, and allow for substantial improvements in either safety or security, beyond adequate protection, while avoiding any unwarranted burden on NRC, the public, or licensees when implementing such backfits." The backfit discussion does not meet this objective in that it does not demonstrate a substantial improvement in safety or security beyond adequate protection. It also does not recognize the burden on the NRC and licensees.

- **Response:** The proposed GL is an information request in accordance with 10 CFR 50.54(f). Information requests are not considered to be subject to the Backfit Rule. The GL is based on current regulations and guidance and does not constitute a change in NRC staff position. However, for Byron and Braidwood, the staff positions with respect to one spurious actuation per fire represents a change in staff position, and if applied to these licensees, would constitute compliance backfits. Nevertheless, the staff has performed a regulatory analysis and determined that the proposed GL provides the best avenue to establish that licensees are in regulatory compliance with respect to multiple spurious actuations.
- **Comment:** The "Backfit Analysis" portion of the GL states that "These assumptions were never included in the regulations or generally adopted by the NRC." This statement is inconsistent with the information contained in the recent draft Regulatory Guide, or NUREG 1778, which states that "the analyst must consider the possibility for each spurious actuation to occur sequentially, as time progresses, on a one-at-a-time basis."
- **Response:** With respect to the required level of circuit protection from fire induced failures, a sequential one-at-a-time approach to

post-fire circuit analysis without a specified time between spurious actuations is essentially the same as a simultaneous multiple spurious actuations approach where there is not enough time between spurious actuations to mitigate the effect of each prior to the occurrence of the next.

- **Comment:** The “Backfit Analysis” discussion and other portions of the draft GL fail to include such technical issues as fire dynamics/growth, actuation of suppression systems, and separation of trained circuits (i.e., most safety-related trained circuits have been separated in accordance with RG 1.75, and both trains must fail simultaneously to cause a problem).
- **Response:** These technical issues are relevant to a risk-informed approach to fire protection and may be used as the basis for an exemption request.

RG 1.75 states that “Post-fire safe-shutdown capability is distinctly different from, and credits operability of different equipment than the safety-related equipment required for emergency shutdown of a nuclear power plant.” RG 1.189, “Fire Protection for Operating Nuclear Power Plants,” provides additional guidance concerning the fire protection area.

Why Licensees Believe That the GL Imposes Undue Burden

- Licensees believe that a large majority of circuit failure inspection findings will not be risk significant.
- Cable fire tests were conservative, and the likelihood of fire damage for those cables most commonly used in the industry is low because of defense-in-depth measures.
- Thousands of amendment requests/exemptions will have to be generated and submitted to the NRC for approval.

Why the Staff Believes that the Burden Imposed by the GL is Justified

- The EPRI/NEI cable fire tests clearly showed that multiple spurious actuations is a problem that might affect safe shutdown.
- If the GL is not issued, the multiple spurious actuation issues will be identified through the inspection process, which is limited to “vertical slices” of the plant’s fire protection configuration, separated by the three-year intervals governing triennial inspections. Some risk significant findings may not be identified expeditiously, while some may ultimately remain unaddressed.
- The staff does not expect thousands of amendment requests/exemptions. Any amendment requests/exemptions should be grouped in a reasonable manner by the licensee before being submitted. Some plants are likely to adopt NFPA 805 since this remains the most expeditious and likely cost-effective way to address concerns regarding multiple spurious actuations.

Summary of Burden to Licensees to Respond to GL

(Non NFPA 805 Plants)

- Review and Respond to GL \$4,347,709
- Implement Comp. Measures \$15,297,465
- Evaluate Affected SSCs \$18,200,000
- Request license amendment/exemption \$1,818,505
- Design & Implement Mods \$43,992,285

- **Total** ~\$85,000,000

- Plants adopting NFPA 805 can respond to the GL with a letter stating they will resolve via NFPA 805.

- Cost of an NPP adopting NFPA 805 \$2,000,000 - \$4,000,000

Summary

- The GL is necessary to determine that licensees are in regulatory compliance.
- Industry cable fire test program re-affirmed regulatory requirements.
- The GL is a request for information from Licensees.
- The GL does not present a backfit, except for Byron and Braidwood.