UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

ACRSR-2199

June 16, 2006

Mr. Luis A. Reyes
Executive Director of Operations
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: DRAFT FINAL GENERIC LETTER 2006-XX: POST-FIRE SAFE-SHUTDOWN CIRCUIT ANALYSIS SPURIOUS ACTUATIONS

Dear Mr. Reyes:

During the 533rd meeting of the Advisory Committee on Reactor Safeguards, May 31-June 1, 2006, we reviewed the Draft Final Generic Letter (GL) 2006-XX: Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations. During our review, we had the benefit of discussions with representatives of the NRC staff, the Nuclear Energy Institute (NEI), Duke Energy, and Progress Energy. We also had the benefit of the documents referenced.

RECOMMENDATION

The Generic Letter 2006-XX: Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations should be issued after the scope of requested information is clarified and the submittal dates are made more realistic.

BACKGROUND

One of the consequences of the Browns Ferry fire in 1975 was a number of spurious actuations of equipment. The proper treatment of spurious actuations that could affect the ability of a nuclear power plant to safely shut down during a fire has been a long-standing source of differing opinion between the NRC staff and the nuclear industry. For many years, the industry contended that it was extremely unlikely that a cable fire would lead to multiple spurious actuations. They argued that it should only be necessary to consider one spurious actuation for a particular cable fire or that, if multiple actuations occurred, they would be spaced sufficiently in time to permit each actuation to be mitigated separately.

In 2001, cable fire tests performed by Electric Power Research Institute (EPRI)/NEI indicated not only that multiple spurious actuations are likely to occur but also that the time between actuations may be insufficient to allow the mitigation of each actuation separately.

If a licensee has not accounted for multiple spurious actuations in its circuits analysis, it may not be in compliance with 10 CFR 50.48 and 10 CFR Part 50, Appendix A, General Design Criterion 3, which require that a licensee provide and maintain free of fire damage one train of systems necessary to achieve and maintain safe shutdown. The intent of the GL is to obtain the information needed to ensure that licensees have adequately addressed the potential for spurious actuations that compromise the capability for safe shut down.

The GL requests that each licensee:

- Within 90 days, submit a description of the plant's licensing basis with respect to the regulatory requirement for protecting redundant safe shutdown trains from multiple simultaneous spurious actuations and maintaining one train free of fire damage and submit a conclusion regarding the compliance of the plant.

  a. If not in compliance, submit a functionality assessment of systems, structures, and components (SSCs) that affect ability to achieve and maintain safe shutdown.

  b. If not in compliance, submit a description of compensatory measures put in place.

- Within 6 months, submit a plan to return all affected SSCs to compliance with regulatory requirements.

Within 30 days of issuance of the GL, the licensee can submit a request for additional time.

DISCUSSION

There are three likely approaches that the licensee will take to bring its plant into compliance:

- Make the modifications necessary to ensure safe shutdown regardless of fire location and with multiple simultaneous spurious actuations.

- Use a risk-informed approach based on Regulatory Guide 1.174 to justify exemptions or license amendments in accordance with 10 CFR 50.12 or 10 CFR 50.90.

- Adopt a performance-based fire protection program in accordance with 10 CFR 50.48, National Fire Protection Association Standard (NFPA) 805.

Among the principal comments by the industry regarding the draft GL are that it: establishes a new regulatory position; does not allow risk-informed methods (as in NEI 00-01) to be used by licensees that are not adopting NFPA 805; and imposes an unreasonable schedule for providing information.

With regard to the question whether the GL establishes a new regulatory position, the NRC's Committee to Review Generic Requirements reviewed this issue and stated that it had no objection to issuing this GL. Consequently, we did not pursue this issue further.

The request for information within 90 days regarding the extent of compliance from licensees with the regulatory intent described in the GL is reasonable. However, it is unreasonable to expect the licensees to perform the requested analyses of multiple spurious actuations within that time period, as would be necessary to assess the functionality of SSCs and to identify appropriate compensatory measures. We agree with the staff's objective to bring the licensees into compliance with regulatory requirements expeditiously. However, we recognize the magnitude of the effort required and the potential benefit of additional experiments that will be

performed over the next six months. The staff has agreed to more clearly define the scope of the information that is to be provided at each deadline and to extend the time by which affected SSCs are identified and compensatory measures are reported.

Many licensees will address multiple spurious actuations by adopting a performance-based fire protection program (NFPA 805). For licensees that do not adopt the performance-based approach, a large number of exemption requests and license modifications may be required. Some combinations of spurious actuations, although conceivable, would have an extremely low frequency of occurrence. In their response to public comments, the staff indicated that the industry should develop screening tools to eliminate low-frequency combinations. In NEI 00-01, Rev. 1, "Guidance for Post-Fire Protection for Existing Light-Water Nuclear Power Plants," NEI proposes such an approach. Regulatory Issue Summary 2004-003 was developed to provide a risk-informed approach to inspections to focus on risk-significant configurations. Similar guidance could be developed as an aid to the exemption or amendment process.

The staff has agreed to clarify the scope of information to be provided at each milestone in the schedule and to provide additional time for the functionality assessment of affected SSCs. The GL should be issued after making these changes.

Sincerely,

/RA/

Graham B. Wallis
Chairman

References:

1. Memorandum dated May 10, 2006, from James E. Lyons, Office of Nuclear Reactor Regulation to John T. Larkins, Advisory Committee on Reactor Safeguards, transmitting for final ACRS review of Draft NRC Generic Letter 2006-XX: Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations, and the Staff's Resolution of public comments.
2. NRC Regulatory Issue Summary 2004-03: Risk-informed Approach for Post-fire Safe-Shutdown Associated Circuit Inspections.
3. NRC Regulatory Issue Summary 2005-30: Clarification of Post-fire Safe-shutdown Circuit Regulatory Requirements.
4. Title 10 Code of Federal Regulations, 50.48 "Fire Protection".
5. U.S. Nuclear Regulatory Commission Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant Specific Changes to the Licensing Basis," July 1998.
6. Title 10 Code of Federal Regulations, 50.12 "Specific Exemptions."
7. Title 10 Code of Federal Regulations, 50.90 "Application for Amendment of License or Construction Permit."
8. NFPA 805 "Performance-Based Standard for Fire Protection for Light-Water Reactor Generating Plants."
9. NEI 00-01 "Guidance for Post-Fire Protection for Existing Light-Water Nuclear Power Plants."

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8. NFPA 805 "Performance-Based Standard for Fire Protection for Light-Water Reactor Generating Plants."
9. NEI 00-01 "Guidance for Post-Fire Protection for Existing Light-Water Nuclear Power Plants."

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