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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

Exelon Generation Company, LLC (Exelon) and AmerGen Energy Company, LLC (AmerGen) appreciate the opportunity to provide comments on the proposed generic letter regarding compliance with existing regulations for post-fire safe shutdown circuit analysis. Our general comments are provided below. The attachment to this letter contains our detailed comments on the proposed generic letter.

Exelon and AmerGen consider that plants' existing licensing bases demonstrate a high level of safety, as well as compliance, in the area of post-fire safe shutdown. Additionally, the current risk-informed inspection, self-assessment, and corrective action processes already provide an effective mechanism for identifying and fixing any risk-significant circuit failure combinations.

Therefore, we recommend the generic letter be re-written as an information request, providing licensees with a forum in which to document the following:

- Their current licensing basis regarding the methodology for evaluating spurious actuations.
- Their licensing basis evolution (history) supporting their current spurious actuation evaluation methodology.
- Their evaluation of the risk significance attributable to spurious actuations, in light of the newly-available cable fire test data. This may take the form of a summary of a self-assessment in accordance with Nuclear Energy Institute fire protection guidance, or a fire probabilistic risk assessment. From the results of this assessment, the licensee should discuss if any actions were required, such as modifications, or revision to their design/licensing basis methodology for evaluating spurious actuations.

This would provide the NRC with the evidence that is needed to conclude that plants are in compliance with their licensing basis and current regulatory requirements, and that the methodology used by the plant for performing their deterministic post-fire safe shutdown circuit analysis results in an acceptable risk.

SESP Review Complete

Template = ADM-013

E-RIDS = ADM-03
Add = A. Markley (AWM)
C. Patel (CPP)
R. Wolfgang (RJW1)

If you have any questions regarding this letter, please contact me at 630 657-2800.

Respectfully,

D. L. Helker/FOR

Kenneth Ainger
Manager - Licensing

Attachment

Attachment

Detailed Comments on Proposed Generic Letter Regarding Post-fire Safe Shutdown Circuit Analysis Spurious Actuations

Industry Cable Fire Tests

It is important to note that the "high likelihood" of hot shorts occurring is contingent on cable damage occurring, and that not all of these hot shorts will manifest as spurious actuations. The conditions needed to cause cable damage are quite severe, and rarely do configurations exist in nuclear power plants where these conditions are possible. Existing fire hazards analyses have already resulted in providing suitable suppression and detection where significant fire hazards exist. Therefore, there are few cases where the damaging conditions depicted in the Electric Power Research Institute (EPRI) test protocol are capable of occurring in a typical nuclear power plant.

Applicability of Defense-In-Depth

NRC regulatory guidance recognizes that no one echelon can be complete by itself, but that it is the overlaying of multiple layers of the defense-in-depth philosophy that is important to the protection of public health and safety.

> Defense-in-Depth (From NUREG-0800, RG 1.120, BTP APCSB 9.5-1)
>
> Nuclear power plants use the concept of defense-in-depth to achieve the required high degree of safety by using echelons of safety systems. This concept is also applicable to fire safety in nuclear power plants. With respect to the fire protection program, the defense-in-depth principle is aimed at achieving an adequate balance in:
> a. Preventing fires from starting;
> b. Detecting fires quickly, suppressing those fires that occur, putting them out quickly, and limiting their damage; and
> c. Designing plant safety systems so that a fire that starts in spite of the fire prevention program and burns for a considerable time in spite of fire protection activities will not prevent essential plant safety functions from being performed.
>
> No one of these echelons can be perfect or complete by itself. Each echelon should meet certain minimum requirements; however, strengthening any one can compensate in some measure for weaknesses, known or unknown, in the others.

Exelon and AmerGen consider that plants have already docketed a methodology that explains what the "certain minimum requirements" are regarding how spurious actuations would be analyzed. This methodology implicitly recognizes the other elements of defense-in-depth limiting the likelihood of having a damaging fire capable of causing spurious actuations. Exelon and AmerGen consider that it is inappropriate to try and separate out spurious actuations for special treatment without acknowledging the defense-in-depth framework under which it lies.

Typically, post-fire safe shutdown analysis includes the following conservatisms, many of which are self-imposed by the licensee as a practical need, due to the limitations on the state-of-the-art in fire modeling at the time the regulation was implemented.

- All fire damage occurs instantaneously (self imposed due to limitations in state-of-the-art)
- Area wide fire damage occurs (self imposed due to limitations in state-of-the-art – Appendix R only requires the postulation of an "exposure fire")
- No credit is given for early detection (self imposed due to limitations in state-of-the-art)
- No credit is given for fixed/automatic suppression
- No credit is given for fire brigade suppression
- No credit is given for low combustible loading or ignition source controls
- Targets separated by less than 20 feet are assumed to be damaged (self imposed).

It is within this conservative context that the "single spurious assumption" must be viewed.

Risk Insights

Exelon and AmerGen consider it inappropriate to use a single probability of spurious actuation (from a small number of tests) taken out of the overall risk context to form the basis for re-interpreting the regulations. When the likelihood of spurious actuations developed by EPRI Report 1003326 is utilized in an actual fire probabilistic risk assessment (PRA) application, experience has shown that the influence of this spurious actuation probability on the overall PRA results is very low.

Numerous licensees have performed NEI 04-06, "Guidance for Self Assessment of Circuit Failure Issues," self-assessments to determine the potential risk significance of their spurious actuations. NRC has participated in, and observed some of these assessments. In addition, Exelon and AmerGen have performed full fire PRAs at many of our sites which consider the effects of multiple spurious actuations. Recently, NRC PRA staff performed an on-site review of one of these Exelon fire PRAs, and identified no concerns. These assessments have not identified cases where the application of multiple spurious actuations has resulted in an unacceptable risk.

We have discussed the results of our fire PRA findings with NRC regional inspectors during triennial fire protection inspections, and with NRC headquarters staff during industry workshops. One observation from these discussions is that the NRC has no established process for obtaining the insights from these NEI 04-06 assessments and fire PRAs.