

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, DC 20555

NRC GENERIC LETTER 2006-XX: POST-FIRE SAFE-SHUTDOWN CIRCUIT ANALYSIS  
SPURIOUS ACTUATIONS

**ADDRESSEES**

All holders of operating licenses for nuclear power reactors, except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel.

**PURPOSE**

The U.S. Nuclear Regulatory Commission (NRC) is issuing this generic letter (GL) to:

- (1) Request addressees to review their fire protection program (FPP) to confirm compliance with applicable regulatory requirements regarding their interpretation of multiple spurious actuations caused by circuit faults (hot shorts, open circuits, and shorts to ground), in light of the information provided in this GL and, if appropriate, take additional actions to establish compliance. Specifically, although some licensees have performed their post-fire safe-shutdown circuit analyses based on an assumption of only a single spurious actuation per fire event or that spurious actuations will occur with sufficient time between them for operators to take corrective actions (commonly referred to by the NRC and industry as "one-at-a-time"), recent industry cable fire test results demonstrated that these assumptions are not valid.
- (2) Require addressees to submit a written response to the NRC in accordance with NRC regulations in Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.54(f).

The NRC is reaffirming the position that multiple spurious actuations caused by circuit failures must be considered and evaluated per 10 CFR 50.48, "Fire protection," and General Design Criterion (GDC) 3, "Fire Protection," in Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities." This failure mode was confirmed by the results of the Electric Power Research Institute (EPRI)/Nuclear Energy Institute (NEI) cable fire tests, which showed a relatively high probability of multiple spurious actuations occurring simultaneously or in rapid succession during or after a fire (see EPRI Report No. 1006961, "Spurious Actuation of Electrical Circuits Due to Cable Fires: Results of an Expert Elicitation," issued May 2002 and NUREG/CR-6776, "Cable Insulation Resistance Measurements Made During Cable Fire Tests," issued June 2002) (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML022600200 and ML022600307). Some licensees have assumed a single spurious actuation

per fire event, and others have assumed that multiple spurious actuations can only occur with sufficient time between them to allow for mitigation. The EPRI/NEI test data clearly show that the assumption that there is sufficient time between actuations to allow for mitigation between multiple spurious actuations is not appropriate. If licensees have not considered multiple spurious actuations occurring simultaneously or in rapid succession during or after a fire in their post-fire safe-shutdown circuit analysis, they may not be in compliance with 10 CFR 50.48 and GDC 3 in Appendix A to 10 CFR Part 50, which require that structures, systems, and components (SSCs) important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions. Licensees who conclude that they are no longer in compliance with 10 CFR 50.48 and GDC 3 in Appendix A to 10 CFR Part 50, based on the information provided in this GL, should implement compensatory measures and inform the staff of their planned corrective actions to establish compliance with 10 CFR 50.48 and GDC 3 in Appendix A to 10 CFR Part 50.

## **BACKGROUND**

The regulatory requirements for post-fire safe-shutdown are given in 10 CFR 50.48 and GDC 3 in Appendix A to 10 CFR Part 50. Additionally, all nuclear power plants (NPPs) licensed to operate before January 1, 1979, are required to comply with Section III.G, "Fire Protection of Safe Shutdown Capability," of Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," of 10 CFR Part 50. All NPPs licensed to operate after January 1, 1979, were evaluated against Section 9.5.1 of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants." The fire protection plan and the associated safety evaluation report (SER) are specifically incorporated into those plants' licensing bases. All NPP licensees are responsible for meeting the fire protection requirements.

The objective of the fire protection requirements and guidance is to ensure that one train of systems necessary to achieve and maintain safe shutdown remains free of fire damage. To do so, licensees must protect circuits whose fire-induced failure could prevent the operation, or cause maloperation, of equipment necessary to achieve and maintain post-fire safe-shutdown. As part of its FPP, each licensee performs a circuit analysis to identify these circuits and to provide adequate protection against fire-induced failures.

Beginning in 1997, the staff noticed that a series of licensee event reports (LERs) identified plant-specific problems related to potential fire-induced electrical circuit failures that could prevent operation, or cause maloperation, of equipment necessary to achieve and maintain safe shutdown. Based on the number of similar LERs, the NRC treated the issue generically. In 1998, the staff started to interact with interested stakeholders in an attempt to understand the problem and develop an effective risk-informed solution to the circuit analysis issue. NRC also issued Enforcement Guidance Memorandum 98-002, Revision 2 (ADAMS Accession No. ML003710123), to provide a process for treating inspection findings while the issues were being clarified. The staff documented these problems in Information Notice (IN) 99-17, "Problems Associated With Post-Fire Safe-Shutdown Circuit Analyses," issued June 3, 1999. Because different stakeholders interpreted the regulations differently, the NRC decided to temporarily suspend the associated circuit part of fire protection inspections. This decision is documented

in an NRC memorandum from John Hannon (Chief, Plant Systems Branch, Office of Nuclear Reactor Regulation (NRR)) to Gary Holahan (Director, Division of Systems and Safety Analysis, NRR) dated November 29, 2000 (ADAMS Accession No. ML003773142).

In 2001 EPRI and NEI performed a series of cable functionality fire tests to further the nuclear industry's understanding of fire-induced circuit failures, particularly spurious equipment actuations initiated by circuit failures. EPRI coordinated this effort and issued the final report (EPRI Report No. 1006961). Additional analysis of the EPRI/NEI test results can be found in NUREG/CR-6776. Based on the test results, the staff and NEI concluded that the probability of fire-induced circuit failures can be relatively high and that there can be a relatively high probability of multiple spurious actuations occurring simultaneously or in rapid succession.

## **DISCUSSION**

Although both the NRC and the industry have used the phrase "one-at-a-time" in connection with post-fire spurious actuations caused by circuit failures, it is not defined in 10 CFR Part 50 regulations or fire protection guidance documents. The phrase has been used in at least two different senses. Some licensees have used "one-at-a-time" to mean that only one spurious actuation need be postulated for any single fire event. Other licensees have used the phrase to mean that multiple spurious actuations do not occur simultaneously and that there is sufficient time between spurious actuations for operators to take corrective actions. NRC has issued SERs that accepted both interpretations for specific situations in specific plants (e.g., NUREG-0876, Supplement No. 6, "Safety Evaluation Report Related to the Operation of Byron Station, Units 1 and 2," ADAMS Legacy Accession No. 8411200507). However, the staff has concluded the regulations mean that these interpretations are only allowed with respect to the design of alternate shutdown capability. The EPRI/NEI cable fire testing conducted in 2001 demonstrated that neither interpretation conforms with the likely effects of a fire in an area containing safe-shutdown cables. Therefore, these interpretations do not ensure safe shutdown.

The letter from S. J. Collins (NRC) to R. E. Beedle (NEI) dated March 11, 1997 (ADAMS Accession No. ML003716454), the NRC reiterated its position that multiple spurious actuations caused by circuit failures must be considered and evaluated. Subsequent to the Collins letter, the 2001 EPRI/NEI fire testing demonstrated that multiple spurious actuations can occur with a relatively high probability and that they can occur simultaneously or in rapid succession without sufficient time for mitigation between actuations.

One of the key observations of the EPRI test report (EPRI Report No. 1006961) was that, "given that a hot short occurs in a multi-conductor cable, it is highly probable (over 80 percent) that multiple target conductors will be affected (i.e., multiple simultaneous dependent hot shorts)." The testing covered most of the types of cable insulation and jacketing materials and the types of raceways commonly used in NPPs. During the testing, numerous variables were introduced to investigate the impact of various factors on cable performance and failure characteristics.

While the staff has maintained that post-fire multiple spurious actuations should be considered, the number of actuations that must be considered has not been defined. Since the deterministic approach to post-fire safe-shutdown analyses assumes that all cables in a fire area are damaged by the fire except where protection described in paragraph III.G.2 of Appendix R to 10 CFR Part 50 is provided (separation of cables with a 3-hour fire barrier, physical separation of cables of redundant trains by 20 feet, or separation of cables with a 1-hour fire barrier and fire suppression and detection), it follows that all possible spurious actuations, as well as the cumulative effect of the actuations, should be considered.

The SERs incorporated into the licensing bases of Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2 (NUREG-0876, Supplement 6), specifically allow a design assumption of a single spurious actuation per fire event in the post-fire safe-shutdown circuit analysis. However, most plants postulated in their licensing basis that multiple spurious actuations occur with sufficient time between spurious actuations for operators to take corrective actions. All licensees are requested to review their circuits analysis to verify that it assumes the possibility of simultaneous multiple spurious actuations during a fire. Depending on the results of this review, licensees may conclude that they are not in compliance with the fire protection regulations. Licensees who so determine shall implement compensatory measures and inform the staff of their plan of corrective actions to establish compliance with 10 CFR 50.48 and GDC 3 in Appendix A to 10 CFR Part 50. One acceptable corrective action is to make plant modifications to protect against possible multiple spurious actuations. Another is to justify an exemption (or license amendment, as applicable) as described in the Methods Of Compliance section of this GL.

The letter from D. J. Modeen (NEI) to L. B. Marsh (NRC) dated May 30, 1997 (ADAMS Legacy Accession No. 9706110218), presents the industry's position on the phrase "one-at-a-time." The industry's position is that "possible functional failure states from a single hot short in the component's control circuitry should be analyzed 'one-at-a-time' (not sequentially nor with cumulative consequences) for a fire in a certain fire area." As one basis for this position, the letter references the response to Question 5.3.10 in GL 86-10, "Implementation of Fire Protection Requirements," issued April 24, 1986. Although this response states that "the safe shutdown capability should not be adversely affected by any one spurious actuation or signal resulting from a fire in any plant area," per Question 5.3.10, the response applies only to Section III.L, "Alternative and Dedicated Shutdown Capability," of Appendix R. The NRC emphasized this position in an April 30, 1982, letter from Dennis M. Crutchfield (Chief, Operating Reactors Branch #5, Division of Licensing) to P.B. Fiedler (Vice President & Director, Oyster Creek) (ADAMS Accession No. ML011150521) by stating that "it is essential to remember that these alternative requirements (i.e., III.G.3 and III.L) are not deemed to be equivalent" to protection required by paragraph III.G.2 of Appendix R to 10 CFR Part 50.

As noted in the attachment to a February 6, 1997, memorandum from L. B. Marsh (Chief, Plant Systems Branch, NRR) to J. F. Stolz (Director, Project Directorate I-2) (ADAMS Accession No. ML053190328) regarding the NRC interpretation of the GL 86-10 guidance on spurious valve actuation, the reference to "any one spurious actuation" in the response to Question 5.3.10 is intended to provide a design basis for determining the capacity and capability of the alternative or dedicated shutdown train (e.g., the size of the pump and the support systems needed to maintain reactor coolant inventory, the scope of onsite electrical power distribution and power needs, and an operational baseline and set of plant conditions to define the scope of initial

manual actions to restore systems necessary to accomplish the required reactor performance goals). Again, these alternative requirements do not provide the same level of protection as required by paragraph III.G.2 of Appendix R to 10 CFR Part 50.

NEI also stated in the May 30, 1997, letter that “any other interpretation leads to complex and costly analysis which is not justified for the very small safety benefit.” The NEI letter offered no assessment of the safety significance of multiple sequential and cumulative failures. It is important to note that the NEI letter dated May 30, 1997, preceded the 2001 EPRI/NEI fire testing. As noted above, the cable functionality fire testing 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 GDC 3 in Appendix A to 10 CFR Part 50, which require that a licensee provide and maintain free of fire damage one train of systems necessary to achieve and maintain safe shutdown.

A bounding analysis on the potential fire risk in terms of core damage frequency (ADAMS Accession No. ML060830212) indicates that despite some likely conservative assumptions, multiple spurious actuations caused by circuit failures can be risk significant.

## **METHODS OF COMPLIANCE**

Based on the information provided in this GL, if a licensee concludes that it is no longer in compliance with the fire protection regulations, there are several acceptable methods to reestablish full regulatory compliance. One way is to reperform the post-fire safe-shutdown circuit analysis based on guidance provided in this GL and make the necessary modifications. Another way to address this issue is to perform either a risk-informed evaluation that considers defense-in-depth and safety margins or a deterministic evaluation.

If a licensee proposes to use a risk-informed approach to justify an exemption in accordance with 10 CFR 50.12 or a license amendment in accordance with 10 CFR 50.90, the licensee should follow the guidance of Regulatory Guide (RG) 1.174, Revision 1, “An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis,” issued November 2002 (ADAMS Accession No. ML023240432).

Licensees who have adopted the standard fire protection license condition in GL 86-10 can make changes to the approved FPP without prior NRC approval if the changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. The NRC provides guidance in GL 86-10 on performing and documenting these changes. Plants licensed after January 1, 1979, that use a risk-informed approach should submit a license amendment in accordance with 10 CFR 50.90. The exception to 10 CFR 50.90, provided in the standard license condition and in 10 CFR 50.48(f)(3), does not apply because the risk assessment approaches used by these plants deviate from the approved deterministic approaches used in their licensing basis. Furthermore, the licensees’ risk assessment tools have not been reviewed or inspected against quality standards found acceptable to the staff. Pending NRC review and approval of these methods, the NRC staff cannot accept that risk calculation methods adequately demonstrate that a change or noncompliance “would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.”

An additional method to achieve compliance is the adoption of a performance-based FPP in accordance with 10 CFR 50.48(c), "National Fire Protection Association Standard 805 (NFPA 805)." RG 1.205, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," issued May 2006 (ADAMS Accession No. ML061100174), and NEI 04-02, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)," Rev. 1, issued September 2005 (ADAMS Accession No. ML052590476), provide additional guidance to licensees planning to use this option.

## **APPLICABLE REGULATORY REQUIREMENTS**

NRC regulations in 10 CFR 50.48 and GDC 3 in Appendix A to 10 CFR Part 50 require each operating NPP (licensed before or after issuance of GDC 3) to have an FPP providing post-fire safe-shutdown capability. That is, a means must be provided of ensuring that one of the redundant trains of safe-shutdown SSCs is protected so that it remains free of fire damage, allowing safe shutdown of the plant. The regulation in 10 CFR 50.90 requires a licensee who desires to amend its license to submit an amendment request to the NRC. An NPP licensed to operate before January 1, 1979, must submit an exemption request in accordance with 10 CFR 50.12 to deviate from the rule.

All NPPs licensed to operate before January 1, 1979 (pre-1979 plants), are required to comply with paragraph III.G of Appendix R to 10 CFR Part 50, which states, in part, that "one train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control station(s) is free of fire damage." Paragraph III.G.2 states, in part, that:

Where cables or equipment, including associated non-safety circuits that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, of redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area outside of primary containment, one of the following means of ensuring that one of the redundant trains is free of fire damage shall be provided.

All NPPs licensed to operate after January 1, 1979, are required to comply with 10 CFR 50.48(a), which requires that each operating NPP have a Fire Protection Plan that satisfies GDC 3 in Appendix A to 10 CFR Part 50. The FPP is incorporated into the operating license for post-1979 plants as a license condition. This license condition specifically cites the staff SER in the licensee's FPP to demonstrate that the license condition has been met (although licensees may modify their FPP as long as there is no adverse effect on safe shutdown).

Based on the regulations that state that cables or equipment that could prevent operation or cause maloperation of a safe-shutdown train of equipment due to hot shorts, open circuits, or shorts to ground must be protected, and the new information provided by the EPRI/NEI cable fire tests, approved FPPs that do not include protection against possible simultaneous

occurrence of multiple spurious actuations (including programs for plants with SERs that specifically approve the assumption of a single spurious actuation per fire event) may not comply with these regulatory requirements.

## **APPLICABLE REGULATORY GUIDANCE**

Fire-induced circuit failures that cause spurious actuations can prevent a train of safe-shutdown equipment from performing its post-fire safe-shutdown function. NRC regulations do not limit the number of spurious actuations that licensees must consider. In addition, NRC regulations do not state whether multiple spurious actuations should be assumed to occur simultaneously or sequentially. Licensees should adequately justify any limits or assumptions used in performing the post-fire safe-shutdown circuit analysis.

In order to demonstrate compliance with the regulatory requirement that one safe-shutdown train remain free of fire damage, licensees should analyze the potential for multiple spurious actuation that are concurrent or in rapid succession and provide adequate protection where required.

Fire modeling techniques and risk analysis techniques which the staff has found acceptable are provided in Section 4.0 of RG 1.205, and may be used in the evaluations.

The deterministic methodology in Chapter 3 of NEI 00-01, Revision 1 "Guidance for Post-Fire Safe Shutdown Circuit Analysis," issued January 2005 (including the associated appendices), for analysis of post-fire safe-shutdown circuits, in conjunction with the guidance provided in this GL, is one acceptable approach to achieving regulatory compliance with post-fire safe-shutdown circuit protection requirements for multiple spurious actuations. Licensees should assume that the fire may effect all unprotected cables and equipment within the fire area simultaneously and address all cable and equipment impacts affecting the required safe-shutdown path in the fire area. Licensees should address all potential impacts within the fire area.

The risk significance analysis methodology provided in Chapter 4 of NEI 00-01 should not be applied as a basis for regulatory compliance except for cases in which a licensee has adopted an NFPA 805 licensing basis in accordance with 10 CFR 50.48(c) or used it to support exemption and license amendment requests for plants that have not adopted an NFPA 805 licensing basis. Furthermore, regardless of the plant licensing basis, the NRC agrees with the NEI 00-01 guidance that "all failures deemed to be risk significant, whether they are clearly compliance issues or not, should be placed in the Corrective Action Program with an appropriate priority for action." The remaining sections of NEI 00-01 provide acceptable circuit analysis guidance on both the deterministic approach and the risk-informed, performance-based approach.

## **REQUESTED ACTIONS**

The NRC requests all addressees to take the following actions:

- (1) Within 90 days of the date of this letter, all addressees are requested to evaluate their licensing bases regarding multiple spurious post-fire safe-shutdown circuit analyses. Specifically, they are requested to compare the plant licensing basis to the regulatory requirement for protecting safe-shutdown trains from multiple simultaneous spurious actuations and maintaining one train free of fire damage.

Based on the plant licensing basis and the information provided in this GL, addressees should reach a conclusion, within 90 days of the date of this GL, on whether the NPP is in compliance with regulatory requirements.

- (2) If addressees conclude that their plants are not in compliance with regulatory requirements, they should, in accordance with their FPP, implement compensatory actions and prepare corrective action plans. These addressees should complete plans within 6 months of the date of this letter for plant modifications, license amendments, exemption requests, or other means to meet the regulatory requirements.

## **REQUESTED INFORMATION**

The NRC requests all addressees to provide the following information:

- (1) Within 90 days of the date of this GL submit a description of their licensing basis regarding multiple spurious post-fire safe-shutdown circuit analyses. Specifically, they should compare the plant licensing basis to the regulatory requirement for protecting redundant safe-shutdown trains from multiple simultaneous spurious actuations and maintaining one train free of fire damage. The 90-day response should also include the addressee's conclusion regarding compliance with the regulatory requirements described in this GL.
- (2) If addressees conclude that their plants are not in compliance with regulatory requirements, within 6 months of the date of this GL, submit the plan and schedule to establish compliance with regulatory requirements for the affected SSCs.

## **REQUIRED RESPONSE**

In accordance with 10 CFR 50.54(f), an addressee must respond as described below so that the NRC can determine whether a facility license should be modified, suspended, or revoked, or whether other action should be taken.

Within 30 days of the date of this GL, an addressee must submit a written response if it cannot provide the information or cannot meet the requested completion date. The response must address any alternative course of action that it proposes to take, including the basis for the acceptability of the proposed alternative course of action.



The required written responses should be addressed to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, 11555 Rockville Pike, Rockville, Maryland 20852, under oath or affirmation under the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f). In addition, a copy of the response should be submitted to the appropriate regional administrator.

## **REASON FOR INFORMATION REQUEST**

As discussed above, the NRC position has been that all multiple spurious actuations caused by circuit failures have to be considered in a post-fire safe-shutdown circuits analysis. The cable fire testing performed by EPRI/NEI in 2001 demonstrated that multiple spurious actuations can occur with relatively high likelihood and that they can occur simultaneously or in rapid succession without sufficient time for mitigation between actuations. Many licensees' circuits analysis and/or safe-shutdown analysis did not consider this relatively high probability.

The staff will review the responses to this GL and will notify affected addressees if concerns are identified regarding compliance with NRC regulations. The staff may also conduct inspections to determine addressees' effectiveness in addressing the GL.

## **RELATED GENERIC COMMUNICATIONS**

GL 86-10, "Implementation of Fire Protection Requirements," April 24, 1986.

GL 91-18, Rev. 1, "Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions," October 8, 1997.

IN 92-18, "Potential for Loss of Remote Shutdown Capability During a Control Room Fire," February 28, 1992.

IN 99-17, "Problems Associated With Post-Fire Safe-Shutdown Circuit Analyses," June 3, 1999.

Regulatory Issue Summary (RIS) 2004-03, "Risk-Informed Approach for Post-Fire Safe-Shutdown Associated Circuit Inspections," March 2, 2004.

RIS 2004-03, Rev. 1, "Risk-Informed Approach for Post-Fire Safe Shutdown Circuit Inspections," December 29, 2004.

RIS 2005-20, "Revision to Guidance Formally Contained in NRC Generic Letter 91-18, 'Information to Licensees Regarding Two NRC Inspection Manual Sections on Resolution of Degraded and Nonconforming Conditions and on Operability'," September 26, 2005.

RIS 2005-30, "Clarification of Post-Fire Safe-Shutdown Circuit Regulatory Requirements," December 20, 2005.

## BACKFIT DISCUSSION

Under the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, 10 CFR 50.109(a)(4)(i), and 10 CFR 50.54(f), this GL requests addressees to evaluate their facilities to confirm compliance with the existing applicable regulatory requirements as discussed in this GL. The NRC position has been that all multiple spurious actuations caused by circuit failures have to be considered in a post-fire safe-shutdown circuits analysis. Also, the 2001 EPRI/NEI fire test program demonstrated that the previous assumptions regarding spurious actuations do not adequately address the potential risk to safe shutdown. The EPRI/NEI cable fire tests clearly showed, during and after a fire, a relatively high probability that multiple spurious actuations will occur simultaneously or in rapid succession. Fire-induced circuit failures that cause spurious actuations can prevent a train from performing its post-fire safe-shutdown function. The regulations require that spurious actuations must be considered.

Although both the NRC and the industry have used the phrase “one-at-a-time” in connection with post-fire spurious actuations caused by circuit failures, it is not defined in 10 CFR Part 50 regulations or fire protection guidance documents. The phrase has been used in at least two different senses. Some licensees have used “one-at-a-time” to mean that only one spurious actuation need be postulated for any single fire event. Other licensees have used the phrase to mean that multiple spurious actuations do not occur simultaneously and that there is sufficient time between spurious actuations for operators to take corrective actions. However, the staff has concluded the regulations to mean that these interpretations are only allowed with respect to the design of alternate shutdown capability. The EPRI/NEI cable fire testing conducted in 2001 demonstrated that neither of the two licensee interpretations described above conforms with the likely effects of a fire in an area containing safe-shutdown cables. The staff's positions in this GL with respect to current fire protection requirements have not changed and do not constitute back fitting as defined in 10 CFR 50.109(a)(1).

NRC recognizes it has issued SERs that accepted both of the above interpretations for specific situations in specific plants (e.g., NUREG-0876, Supplement No. 6, SER for Byron Station Units 1 and 2 and Braidwood Station Units 1 and 2). Therefore, for Byron Station, Units 1 and 2 and Braidwood Station, Units 1 and 2, the staff positions with respect to one spurious actuation per fire represents a change in staff position, and if applied to the licensees of these plants, would constitute back fits under 10 CFR 50.109(a)(4)(i). As discussed in this GL, the imposition of the position with respect to multiple spurious actuations is necessary to comply with the (unchanged) staff interpretation of 10 CFR 50.48 and GDC 3 in Appendix A to 10 CFR Part 50. Staff approval of the “single spurious actuation per fire event” for Byron Station, Units 1 and 2 and Braidwood Station, Units 1 and 2 constituted staff inconsistencies with respect to the necessary prerequisites for demonstrating compliance with 10 CFR 50.48 and GDC 3 in Appendix A to 10 CFR Part 50, and the inconsistencies would be rectified by any back fitting imposed by the NRC consistent with this GL. Therefore, Byron and Braidwood, like all other addressees, are required to respond to this GL and are requested to provide information for the NRC to determine if additionally regulatory action is warranted.

The staff has determined, in accordance with 10 CFR 50.54(f), that the information sought in this GL is necessary to verify licensee compliance with existing regulatory requirements in 10 CFR 50.48 and GDC 3 in Appendix A to 10 CFR Part 50.

#### **FEDERAL REGISTER NOTIFICATION**

The NRC published a notice of opportunity for public comment on this GL in the *Federal Register* (FR) (70 FR 60859) on October 19, 2005. At the request of the industry, the NRC subsequently published a notice reopening the public comment period for this GL in the FR (70 FR 76083) on December 22, 2005. A public meeting was held on March 1, 2006, to discuss the staff's responses to the public comments. The staff's evaluation of public comments is publicly available through ADAMS Accession No. ML062190464.

#### **SMALL BUSINESS REGULATORY ENFORCEMENT FAIRNESS ACT**

The NRC has determined that this action is subject to the Small Business Regulatory Enforcement Fairness Act of 1996. The Office of Management and Budget (OMB) has declared the letter not to be a major rule.

#### **PAPERWORK REDUCTION ACT STATEMENT**

This GL contains information collections that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). These information collections were approved by OMB approval number 3150-0011, which expires on February 28, 2007.

The burden to the public for these mandatory information collections is estimated to range from 180 hours per licensee for compliant licensees to 1,100 hours per licensee for non-compliant licensees, for an average of 600 hours per licensee. This includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments on any aspect of these information collections, including suggestions for reducing the burden, to the Records and Freedom of Information Act/Privacy Services Branch (T5-F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet electronic mail to [INFOCOLLECTS@NRC.GOV](mailto:INFOCOLLECTS@NRC.GOV); and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0011), Office of Management and Budget, Washington, DC, 20503.

#### **Public Protection Notice**

The NRC may not conduct nor sponsor, and a person is not required to respond to, an information collection unless the requesting document displays a currently valid OMB control number.

## CONTACT

Please direct any questions about this matter to the technical contact or the lead project manager listed below or to the appropriate NRR project manager.

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