

NUCLEAR REGULATORY COMMISSION

Proposed Generic Communication

POST-FIRE SAFE-SHUTDOWN CIRCUIT ANALYSIS SPURIOUS ACTUATIONS

AGENCY: Nuclear Regulatory Commission.

ACTION: Notice of opportunity for public comment.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is proposing to issue a generic letter (GL) to:

- (1) Request addressees to review their fire protection program to confirm compliance with existing applicable regulatory requirements regarding their assumptions of the phrase "one-at-a-time" in light of the information provided in this GL and, if appropriate, take additional actions to return to 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 "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, Section 50.54(f) (10 CFR 50.54(f)).

This *Federal Register* notice is available through the NRC's Agencywide Documents Access and Management System (ADAMS) under accession number ML051650017.

DATES: Comment period expires [60 days after FRN is published]. Comments submitted after this date will be considered if it is practical to do so, but assurance of consideration cannot be given except for comments received on or before this date.

ADDRESSEES: Submit written comments to the 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, and cite the publication date and page number of this *Federal Register* notice. Written comments may also be delivered to NRC Headquarters, 11545 Rockville Pike (Room T-6D59), Rockville, Maryland, between 7:30 am and 4:15 pm on Federal workdays.

FOR FURTHER INFORMATION, CONTACT: Robert Wolfgang at 301-415-1624 or by email rjw1@nrc.gov or Chandu Patel at 301-415-3025 or by email at cpp@nrc.gov.

SUPPLEMENTARY INFORMATION:

NRC GENERIC LETTER 2005-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 to confirm compliance with existing applicable regulatory requirements regarding their assumptions of the phrase "one-at-a-time" in light of the information provided in this GL and, if appropriate, take additional actions to return to 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 "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, Section 50.54(f) (10 CFR 50.54(f)).

The reason for this request is that the results from the Electric Power Research Institute (EPRI)/Nuclear Energy Institute (NEI) cable fire tests showed a relatively high probability of multiple spurious actuations occurring simultaneously or in rapid succession during or after a fire (ref. EPRI Report No. 1006961, "Spurious Actuation of Electrical Circuits Due to Cable Fires: Results of an Expert Elicitation," dated May 2002 and NUREG/CR-6776, "Cable Insulation Resistance Measurements Made During Cable Fire Tests," dated June 2002). Some licensees have assumed only a single spurious actuation, and others have assumed that multiple spurious actuations can only occur "one-at-a-time," with sufficient delay between actuations to allow for mitigation. The EPRI/NEI test data clearly show that the use of "one-at-a-time" spurious actuations assumption is not credible. If multiple spurious actuations occurring simultaneously or in rapid succession during or after a fire have not been considered by licensees in their post-fire safe-shutdown circuit analysis, it is possible that they are not in compliance with 10 CFR 50.48 and 10 CFR Part 50, General Design Criterion (GDC) 3. The licensees who conclude that they are no longer in compliance with 10 CFR 50.48 and 10 CFR Part 50, GDC 3, based on the information provided in this GL, are expected to come into compliance with 10 CFR 50.48 and 10 CFR Part 50, GDC 3, using risk-informed or deterministic methods as appropriate to their licensing basis.

BACKGROUND

The regulatory requirements for post-fire safe shutdown are given in 10 CFR 50.48 and 10 CFR Part 50, Appendix A, GDC 3. Additionally, all nuclear power plants (NPPs) licensed to operate before January 1, 1979, are required to comply with 10 CFR Part 50, Appendix R,

Section III.G, "Fire Protection of Safe Shutdown Capability." All NPPs licensed to operate after January 1, 1979, were evaluated against Section 9.5.1 of NUREG-0800, Standard Review Plan (SRP). The fire protection plan (FPP) and the associated safety evaluation report (SER) are specifically incorporated into those plants' licensing bases. All NPP licensees are responsible for meeting fire protection commitments and license conditions made during the establishment of their fire protection program.

The objective of the fire protection requirements and guidance is to provide reasonable assurance that one train of systems necessary to achieve and maintain hot shutdown is free of fire damage. This includes protecting 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 fire protection program, each licensee performs a circuit analysis to identify these circuits and to provide adequate protection against fire-induced failures.

Beginning in 1997, the NRC 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 hot shutdown. The staff documented these problems in Information Notice 99-17, "Problems Associated With Post-Fire Safe-Shutdown Circuit Analysis." Based on the number of similar LERs, the NRC treated the issue generically. In 1998 the NRC 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 (EGM) 98-002, Rev. 2 (ADAMS Accession No. ML003710123), to provide a process for treating inspection findings while the issues were being clarified. Due to the number of different stakeholder interpretations of the regulations, 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, DSSA, NRR) dated November 29, 2000 (ADAMS Accession No. ML003773142).

In 2001 EPRI and NEI did 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 hot shorts. 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 NRC 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 hot shorts, it is not defined in 10 CFR 50 regulations or guidance documents for fire protection. The phrase has been interpreted in at least two different ways. Some licensees have interpreted "one-at-a-time" to mean that only one spurious actuation need be postulated for any single fire event. Other licensees have interpreted the term to mean that multiple spurious actuations do not occur simultaneously, and that there would be sufficient time between spurious actuations to allow 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 Accession No. 8411200507). However, current NRC regulations only allow these interpretations 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.

In a S. J. Collins (NRC) letter to R. E. Beedle (NEI) dated March 11, 1997 (ADAMS Accession No. ML003716454), the NRC reiterated its position that multiple spurious actuations 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 likelihood and that they can occur simultaneously or in rapid succession without sufficient time for mitigation between actuations.

One of the key observations of the test report 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 types of raceways commonly used in nuclear power plants. 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 is provided in accordance with Section III.G.2 of 10 CFR Part 50, Appendix R), 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 some plants (for example, Byron and Braidwood) specifically allow a design assumption of a single spurious actuation per fire event when performing the post-fire safe-shutdown circuit analysis. However, most plants postulated in their licensing basis that multiple spurious actuations occur one-at-a-time. All plants must

review their circuits analysis, assuming possible multiple spurious actuations occurring simultaneously from a fire. Depending on the results of this review, licensees may conclude that they are no longer in compliance with the fire protection regulations. Those licensees who determine that they are no longer in compliance will either have to make plant modifications to protect against possible multiple spurious actuations or request an exemption (or license amendment, as applicable) as described in the "METHODS OF COMPLIANCE" section of this GL.

An NEI letter dated May 30, 1997, 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." 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 Appendix R, Section III.L, "Alternative and Dedicated Shutdown Capability." The NRC emphasized this position in a letter from Dennis M. Crutchfield (Chief, Operating Reactors Branch #5, Division of Licensing) to P. B. Fiedler (Vice President & Director - Oyster Creek) dated April 30, 1982 (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 III.G.2 protection.

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) regarding the NRC policy on the interpretation of NRC 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., 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 III.G.2.

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 of May 30, 1997, preceded the 2001 EPRI/NEI fire testing, and that before the testing, the industry had long claimed that spurious actuations were not credible. 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 their circuits analysis, they are not in compliance with 10 CFR 50.48 and 10 CFR Part 50, GDC 3, which require that a licensee is to provide reasonable assurance that one train of systems necessary to achieve and maintain hot shutdown is free of fire damage.

METHODS OF COMPLIANCE

Based on the information provided in this GL, if a licensee concludes that they are no longer in compliance with the fire protection regulations, there are several acceptable methods for them to re-establish full regulatory compliance. One way is to re-perform the post-fire safe-shutdown circuit analysis based on guidance provided in this GL and make modifications necessary to come into compliance. Another method 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, then this approach should follow the guidance of RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis."
- For those licensees who have adopted the standard fire protection license condition as promulgated in GL 86-10, changes to the approved fire protection program can be made without prior staff approval if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. GL 86-10, "Implementation of Fire Protection Requirements," provides guidance on performing and documenting these changes. Plants licensed after January 1, 1979, that use a risk-informed approach must 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 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 NRC staff. Consequently, the staff believes that the use of risk informed approaches without prior NRC approval may result in changes that could adversely affect safe shutdown.

Fire modeling and risk techniques acceptable to the staff should be used when performing risk-informed evaluations.

An additional method to achieve compliance is the adoption of a performance-based fire protection program in accordance with 10 CFR 50.48(c), "National Fire Protection Association Standard NFPA 805." The Draft Regulatory Guide DG-1139, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," dated

September 2004 (ADAMS Accession No. ML042740308) and NEI 04-02, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)," Rev. 0, dated May 2005 (ADAMS Accession No. ML051440805), provide additional guidance to licensees who plan to use this option.

APPLICABLE REGULATORY REQUIREMENTS

NRC regulations in 10 CFR 50.48 and 10 CFR Part 50, Appendix A, GDC 3, require each operating NPP (licensed before or after issuance of GDC 3) to have a 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 structures, systems, and components must be 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 their license, to submit an amendment request to the NRC. A NPP licensed to operate before January 1, 1979, may submit an exemption request in accordance with 10 CFR 50.12.

All NPPs licensed to operate before January 1, 1979 (pre-1979 plants), are required to comply with 10 CFR Part 50, Appendix R, paragraph III.G, "Fire Protection of Safe Shutdown Capability." Paragraph III.G 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, "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 FPP

that satisfies GDC 3. 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 new information provided by the EPRI/NEI cable fire tests, approved fire protection programs that do not include protection against possible multiple spurious actuations occurring simultaneously (including programs for plants with SERs that specifically approve an assumption of one-only spurious actuation per fire event) may not comply with these regulatory requirements.

APPLICABLE REGULATORY GUIDANCE

Fire-induced hot shorts that cause spurious actuations can prevent a train from performing its post-fire safe-shutdown function. NRC regulations, while noting that spurious actuations must be considered, do not set a limit on the number of spurious actuations that can occur. In addition, NRC regulations do not state whether multiple spurious actuations should be assumed to occur simultaneously or sequentially. Any limits or assumptions used by the licensee in performing the post-fire safe-shutdown circuit analysis should be adequately justified.

In order to demonstrate compliance with the regulatory requirement that one safe shutdown train remain free of fire damage, licensees must address the potential for multiple, concurrent spurious actuations by analyzing for these failures and providing adequate protection where required.

Fire modeling techniques and risk analysis techniques which the staff has found acceptable are provided in Section 4.0 of Draft Regulatory Guide DG-1139, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," dated September 2004 (ADAMS Accession No. ML042740308) and may be used in the evaluations.

The deterministic methodology in NEI 00-01, Rev. 1 (January 2005), "Guidance for Post-Fire Safe Shutdown Circuit Analysis," Chapter 3, 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 affect all unprotected cables and equipment within the fire area and address all cable and equipment impacts affecting the required safe shutdown path in the fire area. All potential impacts within the fire area must be addressed.

The risk significance analysis methodology provided in Chapter 4 of NEI 00-01 should not be applied as a basis for regulatory compliance, except where a National Fire Protection Association (NFPA) 805 licensing basis has been adopted in accordance with 10 CFR 50.48(c). Risk-informed or performance-based methodologies that use the methods and information provided in NEI 00-01 (e.g., Chapter 4 and Appendix B-1) may be used to support exemption requests for plants that have not adopted an NFPA 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

Within 90 days of the date of this letter, all addressees are requested to take the following actions:

- (1) Assess plant post-fire safe-shutdown circuit analyses for regulatory compliance in accordance with the information contained in this GL. The NRC informed licensees of these compliance expectations in a public meeting in October 2004 (ADAMS Accession No. ML043290020).
- (2) Take appropriate compensatory measures in accordance with plant fire protection programs if the addressees' interpretation and use of multiple spurious actuations in their circuits analysis leads to the conclusion that the addressee is no longer in compliance with the fire protection regulations.
- (3) Submit licensee's plans for plant modifications, license amendments or exemption requests that the above evaluation identifies as necessary to re-establish compliance with regulatory requirements and the plant's licensing basis in accordance with the information contained in this GL.

REQUESTED INFORMATION

All addressees are requested to provide the following information:

- (1) Within 90 days of the date of this GL, provide a statement on whether or not you conclude you are in compliance with the regulatory requirements as described in the Applicable Regulatory Requirements section of this GL. Addressees who conclude that they continue to be in compliance with the regulatory requirements in light of the information provided in this GL should state the basis for their conclusion.
- (2) Addressees who conclude that they are not in compliance with the regulatory requirements as described in the Applicable Regulatory Requirements section of this GL, provide the following information:
 - a. An assessment of the functionality of affected structures, systems, and components that addresses the ability to achieve and maintain safe shutdown in

light of multiple spurious hot shorts as a result of a fire. An acceptable assessment would be consistent with an evaluation performed for GL 91-18, Rev. 1.

- b. A detailed description of the compensatory measures in place to maintain the safe shutdown function of affected areas of the plant, and an explanation of how the compensatory measures provide adequate protection.
- c. A general description and planned schedule for any plant modifications made to ensure compliance with the regulatory requirements listed in the Applicable Regulatory Requirements section of this GL.
- d. A general description and planned schedule for any changes to the plant licensing bases resulting from any evaluation performed to ensure compliance with the regulatory requirements listed in the Applicable Regulatory Requirements section of this GL. Include a discussion and schedule for any license amendment or exemption requests needed to support changes to the plant licensing basis.
- e. Where the licensee plans no action under (a) or (b) or (c) or (d), provide a justification for not assessing safety significance or taking compensatory and corrective actions.

REQUIRED RESPONSE

In accordance with 10 CFR 50.54(f), in order to determine whether a facility license should be modified, suspended, or revoked, or whether other action should be taken, an addressee is required to respond as described below.

Within 30 days of the date of this GL, an addressee is required to submit a written response if it is unable to provide the information or it cannot meet the requested completion date. The

addressee must address in its response 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, submit a copy of the response to the appropriate regional administrator.

REASON FOR INFORMATION REQUEST

As discussed above, EPRI/NEI-performed cable fire testing 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. However, many licensees' circuits analysis and/or safe-shutdown analysis did not consider this relatively high probability.

The NRC 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

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

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-XXX, "Clarification of Post-Fire Safe-Shutdown Circuit Regulatory Requirements" (Draft issued for public comment on May 13, 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 fundamental regulatory requirement is that at least one safe-shutdown path be maintained free of fire damage in the event of fire. The NRC's position concerning this regulatory requirement has not changed. All NPPs licensed to operate before January 1, 1979, (pre-1979 plants) are required to comply with 10 CFR Part 50, Appendix R, paragraph III.G, "Fire Protection of Safe Shutdown Capability," including Paragraph III.G.2. Paragraph III.G 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, "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 nuclear power plant have a FPP that

satisfies GDC 3. The fire protection plan is incorporated into the operating license for post-1979 plant as a license condition. This license condition specifically cites the staff SER on 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). All NPP licensees are required to implement their approved fire protection program, considering multiple spurious actuations, in accordance with the applicable regulatory requirements.

Fire-induced hot shorts that cause spurious actuations can prevent a train from performing its post-fire safe shutdown function. The regulations note that spurious actuations must be considered.

Prior to the EPRI/NEI cable fire tests in 2001, very little data was available to provide a basis for predicting the extent or behavior of spurious actuations during a fire. Based on the available data and expert opinion, the industry assumed and, in some specific cases, the NRC accepted that spurious actuations that could prevent safe shutdown were highly improbable.

Consequently, some licensees assumed only a single spurious actuation per fire event. Others assumed multiple spurious actuations, but assumed that they would only occur "one-at-a-time" with time between actuations to take corrective actions. These assumptions were never included in the regulations or generally adopted by the NRC.

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. Consequently, to demonstrate compliance with the regulatory requirement that one safe shutdown train remain free of fire damage (which has always been the NRC's position), and with licensees' licensing bases, licensees must address the potential for multiple concurrent spurious actuations by analyzing these failures and providing adequate protection where required.

The information requested by this GL is therefore considered a compliance exception to the rule in accordance with 10 CFR 50.109(a)(4)(I), as the staff's position set out in this GL regarding the term "one-at-a-time" is necessary for compliance with 10 CFR 50, Appendix R, Paragraph III.G (with respect to pre-1979 plants) and, with respect to post-1979 plants, is necessary for compliance with the plants' license conditions regarding fire protection.

With regard to plants for which the NRC had in the past specifically accepted the assumption that only a single spurious actuation would occur per fire event, or that multiple spurious actuations would occur "one-at-a-time" with time between actuations to take corrective actions, this GL is considered a compliance exception to the backfit rule, in accordance with 10 CFR 50.109(a)(4)(I). New information from the 2001 EPRI/NEI cable fire tests has shown that multiple, simultaneous spurious actuations must be considered for these licensees to be in compliance with NRC's unchanged interpretation of its fire protection requirements, which require that one safe shutdown train remain free of fire damage.

FEDERAL REGISTER NOTIFICATION

A notice of opportunity for public comment on this GL was published in the *Federal Register* (XX FR XXXXX) on October XX, 2005.

SMALL BUSINESS REGULATORY ENFORCEMENT FAIRNESS ACT

The NRC has determined that this action is not subject to the Small Business Regulatory Enforcement Fairness Act of 1996.

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 the Office of Management and Budget (OMB), clearance number 3150-0011, which expires on February 28, 2007.

The burden to the public for these mandatory information collections is estimated to average 300 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. The U. S. Nuclear Regulatory Commission is seeking public comment on the potential impact of the information collections contained in the GL and on the following issues:

1. Is the proposed information collection necessary for the proper performance of the functions of the NRC, including whether the information will have practical utility?
2. Is the estimate of burden accurate?
3. Is there a way to enhance the quality, utility, and clarity of the information collected?
4. How can the burden of the information collection be minimized, including the use of automated collection techniques?

Send comments on any aspect of these information collections, including suggestions for reducing the burden, to the Records and FOIA/Privacy Services Branch (T5-F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet electronic mail to BJS1@NRC.GOV; 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 Office of Nuclear Reactor Regulation (NRR) project manager.

Bruce A. Boger, Director

Division of Inspection Program Management

Office of Nuclear Reactor Regulation

Technical Contact: Robert Wolfgang, NRR
301-415-1624
E-mail: rjw1@nrc.gov

Lead Project Manager: Chandu Patel, NRR
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Note: NRC generic communications may be found on the NRC public Web site, <http://www.nrc.gov> under Electronic Reading Room/Document Collections.

END OF DRAFT GENERIC LETTER

Documents may be examined, and/or copied for a fee, at the NRC's Public Document Room at One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland. Publicly available records will be accessible electronically from the Agencywide Documents Access and Management System (ADAMS) Public Electronic Reading Room on the Internet at the NRC Web site, <http://www.nrc.gov/NRC/ADAMS/index.html>. If you do not have access to ADAMS or

if you have problems in accessing the documents in ADAMS, contact the NRC Public Document Room (PDR) reference staff at 1-800-397-4209 or 301-415-4737 or by e-mail to pdr@nrc.gov.

Dated at Rockville, Maryland, this 13th day of October 2005.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Michael J. Case, Deputy Director
Division of Inspection Program Management
Office of Nuclear Reactor Regulation

if you have problems in accessing the documents in ADAMS, contact the NRC Public Document Room (PDR) reference staff at 1-800-397-4209 or 301-415-4737 or by e-mail to pdr@nrc.gov.

Dated at Rockville, Maryland, this 13th day of October 2005.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Michael J. Case, Deputy Director
Division of Inspection Program Management
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