

U.S. Nuclear Regulatory Commission (NRC) Staff Resolution of Public Comments on the Draft  
Generic Letter (GL) on Post-Fire Safe-Shutdown Circuit Analysis Spurious Actuations  
(By Category and Bin Number)

**Table 1. Key for Resolution of Comments**

<b>Source of Comments</b> (Adams Accession Number)	<b>Comment Designator</b>	<b>Remarks</b>
Dominion Resources Services, Inc. (ML053630063)	D	Received December 20, 2005
GE Energy (ML053630088)	G	Received December 20, 2005
Engineering Planning and Management, Inc. (EPM) (ML053630092)	P	Received December 20, 2005
Tennessee Valley Authority (TVA) (ML053630094)	T	Received December 21, 2005
Strategic Teaming and Resource Sharing (STARS) (ML053640303)	S	Received December 28, 2005
Entergy Operations, Inc. (ML060110221)	E	Received January 4, 2006
TVA (ML060410050)	V	Received February 8, 2006
Boiling-Water Reactor (BWR) Owners' Group (ML060450053)	B	Received February 9, 2006
Nuclear Energy Institute (NEI) (ML060450056)	N	Received February 9, 2006
Exelon/AmeriGen (ML060450062)	X	Received February 9, 2006

**Table 2. Key to Categories of Comments**

<b>Bin No.</b>	<b>Description</b>
1	Comments on risk-informed circuits analysis
2	Comments on Electric Power Research Institute (EPRI)/NEI test results
3	Comments on circuits analysis
4	Comments on backfit determinations and justification
5	Comments on wording and specific references in the GL text
6	Comments on schedule
7	Miscellaneous comments

## **BIN 1 - COMMENTS ON RISK-INFORMED CIRCUITS ANALYSIS**

### **Comment:**

Dominion Resources Comment D1, STARS Comments S2, S7, S8 - Licensees should be able to use Regulatory Information Summary (RIS) 2004-03, Revision 1 to meet compliance expectations concerning post-fire safe-shutdown circuit analysis.

### **Staff Response:**

RIS 2004-03 was intended to focus inspectors' limited resources on potential risk-significant items. RIS 2004-03 does not represent a determination on whether or not regulatory compliance is achieved. The regulations are written to encompass all possible circuits configurations and materials. The proposed GL addresses the regulatory requirements. Plant specific deviations from the regulations based on specific circuit configurations, cable insulation materials, etc., must be addressed via the exemption process.

### **Comment:**

STARS Comment S1, TVA comment V9 - The use of risk insights and tools should not be prohibited for plants that have a deterministic-based licensing basis.

### **Staff Response:**

Although the NRC is moving toward a more risk-informed approach to plant safety and risk informing inspections of circuit issues, the current regulations do not permit a licensee to use risk-informed methods for circuit analysis without prior staff approval of such methods.

### **Comment:**

NEI Comment N6, STARS Comment S8 - The industry developed NEI 00-01, Revision 1, "Guidance for Post-Fire Safe- Shutdown Circuit Analysis," to provide utility licensees deterministic and risk-informed methods for resolution of circuit failure issues. We request NRC acknowledgment that NEI 00-01 provides an acceptable approach of deterministic and risk-informed methods.

### **Staff Response:**

NRC has already acknowledged that NEI 00-01 provides an acceptable approach of deterministic methods. That acknowledgment is provided in RIS 2005-30 and includes qualifications for applying NEI 00-01 to a deterministic-based fire protection program. The regulatory expectations described in this proposed GL are also applicable to the deterministic application of NEI 00-01. The NRC staff plans to acknowledge that NEI 00-01 provides an acceptable approach for a risk-informed licensing basis in the National Fire Protection Association (NFPA) Standard 805 Regulatory Guide.

### **Comment:**

NEI Comment N7, TVA Comment T9, Exelon/AmeriGen Comment X3 - We believe that a large majority of circuit failure inspection findings will not be risk significant. This has been confirmed by the self assessments that were conducted at three plants using the guidance provided in NEI 04-06.

**Staff Response:**

NRC wants licensees to identify and fix risk-significant circuit issues. Items of little or no risk significance may be submitted as a risk-informed exemption request. The staff recommends that licensees develop a risk screening tool (reviewed and approved by the staff) to focus resources on risk significant configurations.

**BIN 2 - COMMENTS ON EPRI/NEI TEST RESULTS**

**Comment:**

TVA Comments T1 and V1, STARS Comment S4 - The applicability of the EPRI/NEI cable fire test results was questioned for various configurations that are different from those tested. It was also stated that other factors, such as dual trains, conduit raceways, less than maximum fill in cable trays, and fire science and fire dynamics were not considered in the test.

**Staff Response:**

These factors may be used as the basis of an exemption request.

**Comment:**

Entergy Comment E3 - The proposed generic letter uses the EPRI/NEI test data to support the desired position, yet the test data is incomplete as there are several issues that were "binned" as requiring further research. There is no current research on these issues and as such the industry is subject to another series of new interpretations of existing NRC requirements. The proposed generic letter should be a conclusion to several years of debate between the NRC staff and industry on the circuit analysis issue.

**Staff Response:**

The 2001 EPRI/NEI cable functionality fire tests clearly demonstrated that there is a high probability of multiple spurious actuations occurring simultaneously or in rapid succession. The binned issues that require additional research would have no effect on whether multiple spurious actuations can occur simultaneously or in rapid succession from a regulatory compliance standpoint. The proposed GL is bringing clarification to the circuits analysis issue.

**Comment:**

STARS Comments S4 and S5, TVA Comment V12, GE Energy Comment G1, NEI Comment N5, BWR Owners' Group Comment B1 - The EPRI test report referenced in the proposed generic communication indicates that the average time to failure for thermoset cables was 46.3 minutes. The longest and shortest times to spurious actuation for thermoset cable were 85.7 minutes and 14.0 minutes, respectively. There is a reasonable likelihood that appropriate mitigative measures can be taken prior to cable failure.

**Staff Response:**

The regulations do not make allowances for time intervals. The regulations are written to encompass all possible circuits configurations and materials, as well as time intervals between failures. The proposed GL addresses the regulatory requirements.

Plant-specific deviations from the regulations based on specific circuit configurations, cable insulation materials, etc., must be addressed via the exemption process.

**Comment:**

General Electric Comment G1, BWR Owners' Group Comment B1, Exelon/Amerigen Comment X1 - The FRN states that the EPRI cable fire tests showed a high probability of spurious actuations. Although this is partially true, it is an incomplete assessment of the test results. What is actually true of the tests is that they showed a relatively high probability of spurious actuations given that the cable was actually damaged by fire. Fire damage for those cables most commonly used in the industry (having thermoset insulating material) did not occur until the cable temperature reached very high temperatures. For the tests performed, cable temperatures generally did not reach this level for at least 30 minutes. Additionally, once the hot shorts did occur, their duration was generally very brief and they ended with a short to ground.

**Staff Response:**

The current regulations are based on the assumption that all cables in a fire area, unless separated per III.G.1 or III.G.2, are actually damaged by a fire with no allowance for cable insulation materials, automatic reset, etc. Plant specific deviations from the regulatory requirements that rely on fire modeling and risk information may be addressed via the exemption process.

**BIN 3 - COMMENTS ON CIRCUITS ANALYSIS**

**Comment:**

TVA Comments T2 T8, V2, and V8, STARS Comment S5, Exelon/AmeriGen Comment X2 - The NRC staff position on "one-at-a-time" is extremely conservative in light of other defense-in-depth elements in place in a fire protection program.

**Staff Response:**

The regulations are based on ensuring an adequate level of defense in depth. The third element of fire protection defense in depth is to protect structures, systems and components from the effects of fire such that their failure will not prevent the safe shutdown of the plant. The cable fire test program demonstrated that a one-at-a-time approach to circuit analysis does not necessarily address all potential failures that could prevent safe shutdown. The fire protection program must provide protection against these potential failures in order to ensure an adequate level of defense in depth.

**Comment:**

TVA Comments T3, V3, V10, V11, V13, V14, and V15, NEI Comment N4 - The clarification provided for the terms "any-and-all, one-at-a-time" negates some routing configurations previously approved by NRC and implemented by licensees. It further implies that at some point in time, NRC was aware and comfortable with how licensees applied these terms to multiple spurious actuations. These applications were consistent with the deterministic approach to Appendix R. Applying circuit analysis assumptions consistent with NRC recommendations fails to recognize the inherent conservatism in the "any-and-all, one-at-a-time" analyses. These are:

Full area burn-out to t=0

The conservative requirement for 20-foot separation, the basis of which is not supported by fire dynamics; Fire dynamics supports a much lower physical separation

No analysis credit for low combustible loading or ignition source limitations

No credit for actuation of automatic/pre-action sprinkler systems

No credit for intervention of fire brigades

**Staff Response:**

Prior to the 2001 EPRI/NEI cable fire testing, very little information was available regarding circuit failure during a fire, which made enforcement of NRC regulations in that area difficult. However, the 2001 testing program provided valuable information and data that demonstrated and confirmed the importance of these regulatory requirements. A licensee may include the above issues in an exemption request. The staff recommends that licensees develop a risk screening tool (reviewed and approved by the staff) to focus resources on risk significant configurations.

**Comment:**

TVA Comment T9 and V9 - Application of the proposed regulatory change does not appear to include provisions for dispositioning issues which are determined to be of little or no-risk significance. Utilization of the proposed GL requirements on a piloted basis identified no applications which were not considered "green" using the NRC significance determination process which by definition is a conservative estimation of risk. Literal compliance with the draft GL requirements through either Appendix R or conversion to a licensing bases, based on NFPA 805, appears to be inconsistent with focusing resources on areas of risk significance.

**Staff Response:**

Items of little or no risk significance may be submitted as a risk-informed exemption request. The staff recommends that licensees develop a risk screening tool (reviewed and approved by the staff) to focus resources on risk significant configurations.

**Comment:**

Entergy Operations Comment E1, STARS Comment S9 - The NRC appears to be prescribing inconsistent safe shutdown criteria with respect to spurious circuit actuations. What is the technical justification for allowing the "any and all one at a time" interpretation for alternative safe shutdown areas (III.G.3) but not for non-alternative safe shutdown areas (III.G.2)? A fire can not tell if the area is an alternative or non-alternative safe shutdown area.

**Staff Response:**

III.G.2 is held to a different standard than III.G.3. III.G.2 protection is the first line of defense in a fire (for plants without III.G.1 protection). III.G.3 protection is a fallback arrangement for protection that does not fully comply with III.G.2 requirements.

**Comment:**

STARS Comment S13 - The general categorization that all circuit analyses that do not consider multiple, spurious actuations, including those that may occur simultaneously or in rapid succession, are inadequate, is not based on demonstrated fact. NEI 00-01 and RIS 2004-03 recognize that circuit analyses are dependent on a number of factors, including cable type. The proposed generic communication should be revised to reflect these additional considerations and to eliminate the broad-based sweeping generalizations of this proposed new regulatory position.

**Staff Response:**

The regulations are written to encompass all possible circuits configurations and materials. The proposed GL addresses the regulatory requirements. Plant-specific deviations from the regulations based on specific circuit configurations, cable insulation materials, etc., fire modeling, and risk analysis must be addressed via the exemption process.

**BIN 4 - COMMENTS ON BACKFIT DETERMINATIONS AND JUSTIFICATION**

**Comment:**

TVA Comments T6 and V6 - The "Backfit Analysis" portion of the draft GL contains technical omissions and general information that is inconsistent with prior NRC documentation. Specifically, the "Backfit Analysis" portion of the GL states, "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 (RG), or NUREG 1778, which provides a clear definition of "any-and-all, one-at-a-time" (refer to Section 2, page 2-3) and provides a clarification of "Criteria/Assumptions" (refer to Section 6.4.6.2, "Circuit Analysis Criteria and Assumptions") which states, ". . . however, the analyst must consider the possibility for each spurious actuation to occur sequentially, as the fire progress, on a one-at-a-time basis." While this is recognized as a draft document, it does appear to provide a historical perspective of this topic. In comparison, the content of this document suggests that those involved in the original development and approval of licensee Fire Protection Programs at numerous facilities may have developed it.

**Staff 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. Unless the licensee can adequately demonstrate that sufficient time is available to take mitigating action between each sequential actuation (and that the mitigating action is feasible and reliable), the same level of protection must be provided. Draft NUREG-1778, as well as the regulations, does not address the expected time between actuations since this time will be unique for each situation.

Some licensees may have interpreted the reference to one-at-a-time in NUREG-1778 to mean that the circuit analysis can assume that there will be sufficient time between spurious actuations to take mitigating actions. That interpretation is incorrect and the cable fire test program demonstrated that such an assumption has been shown to be invalid.

**Comment:**

TVA Comments T7 and V7 - Additionally, 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.)

**Staff Response:**

Technical issues such as fire dynamics/growth and suppression system actuation are relevant to a risk-informed approach to fire protection and may only be used as the basis for an exemption request. Regulatory Guide 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. Regulatory Guide 1.189, "Fire Protection for Operating Nuclear Power Plants," provides additional guidance concerning the fire protection area. Regulatory Guide 1.189, paragraph 5.5 b states "Separation of cables and equipment and associated non-safety circuits of redundant success paths by a horizontal distance of more than 6.1 meters (20 feet) with no intervening combustible or fire hazards."

**Comment:**

STARS Comment S6 - 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. In addition, it does not recognize the potential burden, particularly on the NRC and licensees, of the proposed generic communication and the new staff position being imposed therein. The proposed generic communication may result in substantial re-analyses of a licensee's established fire protection program, require extensive modifications to the facility, and may result in a significant number of exemption or license amendments requests (including requests to adopt Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50.48(c)), all to address risk-insignificant issues where adequate protection of the public health and safety already exists.

**Staff Response:**

The proposed GL does not backfit any plants. Its purpose is to share information with the licensees and request that licensee confirm whether they continue to be in compliance with the fire protection regulations. The staff has performed a regulatory analysis and determined that the GL provides the best avenue to establish that licensees are in regulatory compliance with respect to the multiple spurious actuations. The staff realizes that the proposed GL will place a burden on licensees and the staff, but the staff believes it is a necessary burden to protect public health and safety.

**Comment:**

NEI Comment N3 - In effect, the NRC is using a generic communication to change the plant licensing basis. The NRC has determined that the information requested is a compliance exception in accordance with the provisions of 10 CFR 50.109(a)(4)(i). The NRC has not provided a documented evaluation that is required by this regulation.

**Staff Response:**

NRC is using this generic communication to inform licensees that they may not be in compliance with the regulations. 10 CFR 50.109(a)(4) states "The provisions of paragraphs (a)(2) and (a)(3) of this section are inapplicable and, therefore, backfit analysis is not required . . . where the Commission or staff, as appropriate, finds and declares, with appropriated document evaluation for its finding, either: (I) That a modification is necessary to bring a facility into compliance with a license or the rules or orders of the Commission . . ." Therefore, a backfit analysis is not required. However, 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 the multiple spurious actuations.

**BIN 5 - COMMENTS ON WORDING AND SPECIFIC REFERENCES IN THE GL**

**Comment:**

TVA Comments T4 and V4 - The proposed GL states, "The staff found no documented evidence that it has taken positions inconsistent with this GL." This statement is inaccurate. The proposed regulatory "clarifications" conflicts with past NRC positions and/or interpretations documented in some safety evaluation reports (SERs), other NRC documents, and public proceedings. The proposed GL further seems to be inconsistent with the "discussion" portion of the proposed GL which appears to acknowledge that plants have been licensed using multiple interpretations of "any-and-all, one-at-a-time." Issuing regulatory interpretations or guidance contrary to existing documentation potentially results in liabilities to the utility and the NRC.

**Staff Response:**

The proposed GL does not contain the phrase "The staff found no documented evidence that it has taken positions inconsistent with this GL." The proposed GL acknowledges that SERs have been issued that allowed circuit analysis assumptions that are not consistent with this proposed GL. Industry testing has demonstrated that those assumptions are not valid.

**Comment:**

STARS Comment S16 - "Requested Actions" - The second sentence of Item (1) does not provide relevant information. STARS recommends deleting this sentence and replacing it with a sentence that provides specific guidance, similar to that provided in NEI 00-01, for performing these assessments.

**Staff Response:**

NRC staff agrees with this comment. The sentence can be deleted. The first sentence of Item (1) provides guidance for the assessment required.

**Comment:**

STARS Comment S17 - "Backfit Discussion," paragraph beginning with "The 2001 EPRI/NEI fire test program," third sentence - this sentence includes the phrase "and with licensees' licensing basis." This phrase, when taken in the context of this statement may be inaccurate. As stated in the proposed generic communication, a licensee's existing licensing basis may allow for a single spurious actuation, or multiple, spurious actuations taken one-at-a-time, for certain analyses, which may, or may not be, interpreted to pertain only to alternate shutdown capability (see Comment 12). In addition, the regulatory position stated in the proposed generic communication could represent a new compliance strategy for most plants. Therefore, their existing licensing basis may not consider multiple, spurious actuations, or multiple, spurious actuations that occur simultaneously or in rapid succession. This phrase should be deleted from this sentence.

**Staff Response:**

NRC staff agrees with this comment. The phrase will be revised to read "and with licensees' licensing bases (if applicable) . . ."

**Comment:**

STARS Comment S18 - "Applicable Regulatory Guidance" - this section refers to Draft Regulatory Guide DG-1139, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," as being an acceptable method for performing evaluations. It is inappropriate to reference a draft document that is subject to change prior to receiving final NRC approval. This reference should be modified to state that the techniques described in this document may be used when final approval is received, or include a provision that acknowledges the risk that the document is subject to change, and that licensees who choose to use this information do so at their own risk.

**Staff Response:**

The NRC staff agrees with this comment. The proposed GL will be revised accordingly.

**Comment:**

STARS Comment S19 - "Requested Information," Item (2)(a) - The reference to Generic Letter 91-18, Revision 1, is incorrect. GL 91-18 has been superseded in its entirety by Regulatory Issue Summary 2005-20, Revision to Guidance Formerly 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," dated September 26, 2005.

**Staff Response:**

NRC staff agrees with this comment. The proposed GL will be revised accordingly.

**Comment:**

STARS Comment S20 - The references to "10 CFR Part 50, General Design Criterion (GDC) 3" are not complete. STARS suggest providing the complete reference to this criterion on the first instance (10 CFR Part 50, Appendix A, General Design Criterion 3), and correcting all subsequent references to "10 CFR 50, Appendix A, GDC 3."

**Staff Response:**

NRC staff agrees with this comment. The proposed GL will be revised accordingly.

**Comment:**

STARS Comment S21 - The references to "10 CFR 50.109(a)(4)(I)" appear to be incorrect. The correct reference should be "10 CFR 50.109(a)(4)(i)."

**Staff Response:**

NRC staff agrees with this comment. The proposed GL will be revised accordingly.

**Comment:**

TVA Comments T5 and V5 - NRC's suggestion that a licensee's conversion to NFPA 805 regulations is a relatively straightforward and inexpensive process is inaccurate. The process will most likely take three or more years at a cost that exceeds five million dollars, while exposing licensees to unknown regulatory uncertainties. For example, the development of a regular plant probabilistic risk analysis relies heavily on engineering judgement that could lead to differing professional opinions and significant cost and schedule ramifications. Similar uncertainties exist when considering fire modeling. There appears to be no single standard that contains modeling conservatisms acceptable to licensees and the NRC. Resolution of these type issues could result in significant expenditures of resources.

**Staff Response:**

The proposed GL does not suggest that a licensee's conversion to NFPA 805 is a relatively straightforward and inexpensive process.

**Comment:**

STARS Comment S11 - The statements "multiple spurious actuation(s)" and "multiple spurious actuations that occur simultaneously or in rapid succession" appear to be used interchangeably throughout this document. Clarification should be provided to clearly distinguish between the two phrases, since each phrase has a very specific meaning that differs greatly for how these phrases are to be treated in the post-fire safe shutdown circuit analyses.

**Response:**

RIS 2005-30 addresses regulatory expectations with respect to multiple spurious actuations. This proposed GL addresses regulatory expectations with respect to the assumptions for the timing of those actuations. Both phrases apply to circuit analyses for fire areas where more than one spurious actuation could prevent safe shutdown.

**Comment:**

Entergy Operations Comment E2 - This proposed document, as well as other recent documents on the issue, states that "All plants must review their circuits analysis, assuming possible multiple spurious actuations occurring simultaneously from a fire." The "requirement" as proposed is that you must consider all multiple spurious actuations occurring simultaneously. The complete application of this requirement is recognized by the NRC and industry as not feasible/reasonable; NRC has provided informal guidance (such as consider the worst two or three simultaneous spurious actuations) to clarify the intent of the requirement. This appears to be inconsistent guidance proposed by the regulator that will be an open and unclear issue for debate during NRC inspections. The generic letter should provide a clear and reasonable requirement.

**Staff Response:**

The 2001 EPRI/NEI cable functionality fire tests clearly demonstrated that there is a high probability of multiple spurious actuations occurring simultaneously or in rapid succession. The current regulations do not provide a limit on the number of spurious actuations to consider. If a licensee does not want to consider all spurious actuations in their circuits analyses, they can use the fire modeling or probabilistic bases in support of an exemption.

**Comment:**

EPM Comment P1 - The proposed GL in part states:

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 cables and equipment impacts affecting the required safe shutdown path in the fire area. All potential impacts within the fire area must be addressed.

Section 3.5.1.5(C) of NEI 00-01 states:

For cases involving the potential damage of more than one multiconductor cable, a maximum of two cables should be assumed to be damaged concurrently. The spurious actuations should be evaluated as previously described. The consideration of more than two cables being damaged (and subsequent spurious actuations) is deferred pending additional research.

These statements are in conflict with each other. It appears that NEI 00-01 is limiting the spurious actuations resulting from only two cables, similar to RIS-2004-003. However, the GL states that fire may impact all unprotected cables. Please provide clarification for this issue.

**Staff Response:**

The key wording in the proposed GL is “in conjunction with the guidance provided in this GL.” This means that the deterministic methodology in NEI 00-01 may be used, but the information requests included in this proposed GL must be addressed (i.e., all unprotected cables in a fire area are affected by a fire).

RIS 2004-03 was intended to focus inspectors’ limited resources on potential risk-significant items. RIS 2004-03 does not represent a determination on whether or not regulatory compliance is achieved. The regulations are written to encompass all possible circuits configurations and materials. The proposed GL addresses the regulatory requirements.

**Comment:**

STARS Comment S12 - The fifth sentence of the first paragraph of the "Discussion" section states that "However, current NRC regulations only allow these interpretations with respect to the design of alternate shutdown capability." In STARS opinion, the NRC interpretation that this statement applies only to alternate shutdown capability may be incorrect, and licensees may have a differing view. Each safety evaluation report must be reviewed to determine how these interpretations were applied to each plant.

Regardless of how the interpretation is applied, this paragraph continues on to state "Therefore, these interpretations do not ensure safe shutdown." This is a broad, all-encompassing statement that is made based on specific, limited fire test results. This statement does not take into consideration the specific analyses that were performed, nor does it account for actual plant configurations and fire detection and suppression design features. To simply state that safe shutdown is not ensured due to the consideration of one assumption is misleading at best. This statement should be deleted in its entirety, or be revised to reflect that a licensee's existing analyses may not be sufficient to demonstrate that safe shutdown is ensured.

**Response:**

The sixth paragraph of the “Discussion” section of the proposed GL states that one basis for the industry’s position on the phrase “one-at-a-time” is the Response to Question 5.3.10 in GL 86-10. 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.” However, this response applies only to Appendix R, Section III.L, “Alternate and Dedicated Shutdown Capability.” If a failure mechanism that could prevent safe shutdown has not been addressed in the post-fire safe-shutdown circuit analysis, then the analysis does not ensure safe shutdown. The specific analyses that were performed, the plant configurations, and the fire detection and suppression design features may be used as the basis for a risk-informed exemption request.

**Comment:**

STARS Comment S14 - The fifth paragraph of the "Discussion" section includes the statement "All plants must review their circuit analysis, assuming possible multiple spurious actuations occurring simultaneously from a fire." No further guidance is provided on how this expectation is to be met.

**Response:**

Guidance on how this expectation is to be met is provided in the "Applicable Regulatory Guidance" section of the proposed GL. In this section it is stated that:

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 may also submit an exemption request based on risk-informed analysis methods.

**Comment:**

STARS Comment S15 - "Methods of Compliance" - this section implies that the risk-informed approach guidance provided in Regulatory Guide 1.174 is an acceptable method for providing the basis of an exemption request. The second bullet states that plants licensed after January 1, 1979, can not use a risk-informed approach without applying for a license amendment. This treatment of risk insights is inconsistent, with the sole determining factor appearing to be dependent on who has right-of-approval. The NRC recognizes RG 1.174 as an approach that provides acceptable methods. The standard license condition delegates certain aspects of right-of-approval to the licensee, provided that certain conditions are met. Therefore, licensees with the standard license condition should be able to review and accept changes using the same methods that are acceptable to the NRC staff for other licensing actions, provided that the ability to achieve and maintain safe shutdown is not adversely affected.

**Staff Response:**

As stated in the second bullet of the referenced section of the proposed GL, 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." The guidance and acceptable risk thresholds provided in RG 1.174 are predicated on the licensee submitting a license amendment for NRC review and approval.

**Comment:**

BWR Owners' Group Comment B4 - The last paragraph on page for of the GL states that the "industry had long claimed that spurious actuations were not credible." These tests would not have been conducted if the industry actually believed that fire-induced spurious actuations were not credible.

**Staff Response:**

The referenced statement is a simplification of the industry position based on discussions with NRC staff members that have been involved in this issue for many years. However, since the deletion of this statement will have no impact on the proposed GL, rather than debate the accuracy of the statement, it will be deleted.

**BIN 6 - COMMENTS ON SCHEDULE**

**Comment:**

STARS Comment S10 - "Requested Actions" and "Requested Information" - the 90-day time period for the responses is arbitrary, and it may not allow sufficient time for licensees who may be affected by this issue to adequately respond and provide the requested information. Depending on the extent of condition and the proposed corrective action(s), it may take a licensee a significant amount of engineering and support resources to perform the operability determinations, take appropriate compensatory measures, and to design, schedule, and implement the corrective action solution(s), and/or apply for a license amendment or exemption. STARS recommends extending the response period for Requested Actions (2) and (3), and Requested Information (2), including all sub-parts, to a mutually agreeable time frame so that an adequate and complete response may be developed by the licensee.

The NRC staff should work with the industry during the public comment resolution process to develop a response time period that balances the safety significance and risk of the issue with providing licensees with sufficient time to provide a complete and adequate response.

**Response:**

The proposed GL has been revised to read, "within 6 months of the date of this letter, determine plans for plant modifications, license amendments, exemption requests, or other means, to meet regulatory requirements and the plant's licensing basis." Also, in the "Required Response" section of the proposed GL, it is stated that "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."

## **BIN 7 - MISCELLANEOUS COMMENTS**

### **Comment:**

GE Energy Comment G2, BWR Owners' Group Comment B2 - NRC discounts the industry position on "one-at-a-time," as stated in an NEI letter of May 30, 1997, based on a position stated in a 1982 NRC letter from Dennis Crutchfield to P.B. Fiedler. First, an NRC letter to a licensee is not an appropriate mechanism for conveying a staff position of generic applicability. Second, this justification was not made widely known until the publication of the current FRN (70 FR 60859).

In addition, the NRC states that the May 30, 1997, NEI letter offered no assessment of the safety significance of multiple sequential and cumulative failures to support its contention that such failures were low significance. This is true, but pilot probabilistic risk assessment (PRA) studies performed later did demonstrate that such failures were of low significance, as noted above.

### **Staff Response:**

The NRC discounts the industry position on one-at-a-time based on the regulatory requirements of Appendix R and GL 86-10 and on the results of the cable fire test program. The April 30, 1982, NRC letter from Dennis Crutchfield to P. B. Fiedler is referenced in the proposed GL to provide additional insight into the basis for the staff positions stated in Appendix R and GL 86-10. NRC has observed the results of at least one pilot PRA study.

### **Comment:**

BWR Owners' Group Comment B3 - The fact is ignored that licensees have been complying (as measured by licensing submittals and inspections) with their licensing bases for many years prior to the emergence of fire-induced circuit failures as an issue in 1996 . . . Arguments that plants can resolve circuit failure issues through adopting NFPA 805 ignore the fact that transition to a new methodology will take significant time and require extensive use of limited resources . . . Arguments that plants not adopting NFPA 805 can submit risk-informed exemption requests ignore the unnecessary burden this will place on NRC staff and industry alike. Numerous exemption requests for multiple circuit failures would have to be submitted by each plant in order to come into compliance . . .

### **Staff Response:**

Inspections do not establish regulatory requirements. As noted above, the staff recognizes the significant cost and time required to adopt NFPA 805. The staff also recognizes the potential impact of preparing and reviewing many exemptions requests. The staff recommends that licensees develop a risk screening tool (reviewed and approved by the staff) to focus resources on risk significant configurations.