



NUCLEAR ENERGY INSTITUTE

Alexander Marion
DIRECTOR, ENGINEERING
NUCLEAR GENERATION DIVISION

June 17, 2003

Mr. John Hannon
Chief, Plant Systems Branch
Office of Nuclear Reactor Regulation
Mail Stop O11-A11
U. S. Nuclear Regulatory Commission
Washington, DC, 20555-0001

PROJECT NUMBER: 689

Dear Mr. Hannon:

Enclosed is Revision 0 of NEI 02-03, Guidance for Performing a Regulatory Review of Proposed Changes to the Approved Fire Protection Program. We understand that NRC does not intend to approve this document for licensee use; however, we request that you review the document and provide either comments or a response to NEI indicating that you have reviewed it with no further comments. This will permit licensee use of the method with some confidence that it is acceptable to NRC.

Since 10 CFR 50.59 is deemed not to apply to most fire protection program changes, this document provides guidance to licensees on one acceptable method for determining whether prior NRC approval is required for changes to approved fire protection programs. This determination focuses on whether the ability to achieve and maintain safe shutdown is adversely impacted by the proposed change. We appreciate the review by NRC of an earlier draft, and believe we have addressed the comments thereon.

Please contact me (am@nei.org or 202-739-8080) or Fred Emerson (fae@nei.org or 202-739-8086) with any questions or comments on this transmittal.

Sincerely,

A handwritten signature in cursive script that reads "Alex Marion".

Alexander Marion

Enclosure

c: Mr. Sunil Weerakkody, NRC
Ms. Eileen McKenna, NRC

NEI 02-03

**Guidance for Performing
a Regulatory Review of
Proposed Changes to the
Approved Fire Protection
Program**

June 2003

NEI 02-03

Nuclear Energy Institute

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Oscar Pipkins, Entergy
Dan Roberts, Exelon

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EXECUTIVE SUMMARY

With the changes to the 10 CFR 50.59 rule in effect, it is no longer a requirement for plants to use 10 CFR 50.59 analyses to implement changes to fire protection programs. NEI 02-03 provides guidance for determining whether prior NRC approval is required for changes to the approved fire protection program. Prior NRC approval is not required if the change is shown not to impact the ability to achieve and maintain safe shutdown.

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GUIDANCE FOR PERFORMING A REGULATORY REVIEW OF PROPOSED CHANGES TO THE APPROVED FIRE PROTECTION PROGRAM

1 INTRODUCTION

1.1 PURPOSE

The purpose of this document is to provide generic guidance for use by licensees to develop a regulatory review process for determining if a change to the approved fire protection program (AFPP) does or does not require prior Nuclear Regulatory Commission (NRC) approval.

The process outlined in this guidance is intended to be used in accordance with 10 CFR 50.59 (c)(4) when changing the AFPP, including systems, administrative and technical controls, organization, and other plant features associated with the program, as defined in the license condition including the Updated Final Safety Analysis Report (UFSAR) and Safety Evaluation Reports (SERs). Documents that may be affected by changes to the fire protection program, and thus fall within the scope of this guidance, typically include, but are not limited to, the following:

- Fire Protection Plan (FPP)
- UFSAR Section 9.5-1, applicable fire protection appendices, and other UFSAR Sections with fire protection licensing and design basis information
- Fire Hazards Analysis (FHA)
- Safe Shutdown Analysis (SSA)
- Fire protection implementing procedures (i.e., administrative controls, operating, maintenance, fire brigade and test procedures), including post fire safe shutdown procedures
- Fire protection sections of the Technical Requirement Manual (TRM) or equivalent document / procedure
- Fire protection drawings
- Fire protection system setpoints
- Fire protection commitments (including those contained in SERs and docketed correspondence)

This guidance is intended to supplement, but not replace, other plant procedures that are used for implementing design, procedure, and other program changes. Those procedures should be used to assess the feasibility and safety of the proposed change, prior to the application of this guidance. If the proposed activity involves aspects other than fire protection, then additional regulatory review outside the scope of this guidance, including 10 CFR 50.59 evaluation, may be required to determine if the proposed activity can be implemented without prior NRC approval.

2 BACKGROUND

2.1 APPLICATION OF 10 CFR 50.59 TO APPROVED FIRE PROTECTION PROGRAMS

With the changes to the 10 CFR 50.59 rule in effect, it is no longer a requirement for plants to use 10 CFR 50.59 analyses to implement changes to fire protection programs. NEI 96-07, Revision 1, Section 4.1.5, provides information on making changes to approved fire protection programs:

“Most nuclear power plant licenses contain a section on fire protection (FP). Originally, these fire protection license conditions varied widely in scope and content. These variations created problems for licensees and for NRC inspectors in identifying the operative and enforceable fire protection requirements at each facility.

To resolve these problems, the NRC promulgated guidance in Generic Letter 86-10, “Implementation of Fire Protection Requirements,” for licensees to:

- *Incorporate the fire protection program and major commitments into the FSAR for the facility, and*
- *Amend the operating license to substitute a standard fire protection license condition for the previous license condition(s) regarding fire protection.*

Under the standard fire protection license condition, licensees may:

- *Make changes to their approved FP programs without prior NRC approval provided that the changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire, and*
- *Alter specific features of the approved program provided such changes do not otherwise involve a change to the license or technical specifications, or require an exemption.*

Adoption of the standard fire protection license condition provided a more consistent approach to evaluating changes to the facility, including those associated with the fire protection program. Originally, changes to the FP program under the FP license condition were also subject to 10 CFR 50.59; however, this created confusion as to which regulatory requirement governed FP program changes.

10 CFR 50.59(c)(4) provides that when applicable regulations establish more specific criteria for controlling certain changes, 10 CFR 50.59 does not also apply. Consistent with this intent, the standard fire protection license condition establishes specific criteria for control of fire protection changes and falls within the scope of 10 CFR 50.59(c)(4). Thus, applying 10 CFR 50.59 to fire protection program changes is not required.”

NEI 96-07 Revision 1 Section 1.2.1 also states:

"Where a licensee possesses a license condition that specifically permits changes to the NRC-approved fire protection program (i.e., has received the standard fire protection license condition contained in Generic Letter 86-10), subsequent changes to the fire protection program would be controlled under the license condition and not 10 CFR 50.59."

2.2 PERFORMING FIRE PROTECTION CHANGE EVALUATIONS

NEI 96-07, Revision 1 also provides guidance for performing fire protection change evaluations:

"Changes to the fire protection program should be evaluated for impacts on other design functions, and 10 CFR 50.59 should be applied to the non-fire protection related effects of the change, if any."

Consistent with current practice, determinations made under the standard fire protection license condition should be based on a written evaluation that remains available for NRC review for the life of the plant. These written evaluations should provide the basis for the licensee's conclusion that changes to the fire protection program do not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. An evaluation performed in accordance with the license condition should include an assessment of the impact of the change on the existing fire hazards analysis for the area, as is current practice. The assessment should address the effects on combustible loading and distribution and should consider whether circuits or components, including associated circuits, for a train of equipment needed for safe shutdown could be affected, or whether a new element could be introduced into the area."

Under the standard license condition, approved fire protection program documents (e.g., fire hazards analysis) are incorporated in the UFSAR, and as such, changes to this information are subject to 10 CFR 50.71(e) reporting requirements."

3 TERMS AND DEFINITIONS

The definitions provided in this section are based on guidance provided in References 7.1.1 and 7.1.3.

3.1 APPROVED FIRE PROTECTION PROGRAM (AFPP)

In general, the AFPP at each site is an integration of equipment, procedures and personnel necessary to implement fire protection activities. These activities establish the protection of structures, systems, and components important to safety or to achieve post fire safe shutdown (or both), and to minimize the possibility of radioactive release to the environment. The AFPP elements controlled by the licensee typically consist of:

- The documents referenced in a site's NRC SERs, which may include the FHA, the SSA, responses to NRC questions, and comparisons of plant designs to the NRC fire protection guidelines or requirements
- The fire protection features described in the UFSAR, including the fire protection and post-fire safe shutdown systems necessary to satisfy NRC requirements
- The fire protection administrative procedures and technical controls, fire brigade, and the fire protection staff, as well as any other fire protection features adopted for the protection of structures, systems, and components important to safety, and to achieve post-fire safe shutdown. For many plants these features are described in the Technical Requirements Manual or the Fire Protection Program Administrative Manual.

3.2 CURRENT FIRE PROTECTION LICENSING BASIS

The licensing basis for the fire protection program is site specific. The regulatory requirements are driven by the time frame in which the plant was licensed. The documents and correspondence that demonstrate compliance with these requirements, combined with any specific commitments or agreements with the NRC, form each site's licensing basis. Some plants have submitted a separate document included by reference in their UFSAR which documents the licensing basis for the facility. These documents are typically referred to as FHAs, Fire Protection Evaluation Reports, or Fire Protection Review Reports.

Note: The NRC definition for "current licensing basis" is contained in 10 CFR 54.3.

3.3 DEVIATION

A departure or variation from applicable fire protection regulatory requirements, recommendations, or licensing basis. See also GL 86-10 Question 8.20)

3.4 EXEMPTION

(Applicable to pre-January 1, 1979 plants) A deviation from 10 CFR 50 requirements specifically requested from, and approved by, the NRC in accordance with 10 CFR 50.12.

3.5 FIRE PROTECTION PROGRAM CHANGE REGULATORY REVIEW (FPPCRR)

This review determines whether a change to the fire protection program can be made without prior NRC approval.

3.6 GENERIC LETTER 86-10 EVALUATION

A Generic Letter (GL) 86-10 evaluation is performed to assess deviations from applicable fire protection code, regulatory, or design requirements (e.g., 10 CFR 50.48 and Appendix R, Branch Technical Position (BTP) Appendix A, NUREG-0800, National Fire Protection Association (NFPA) codes, etc.). These evaluations, also referred to as Appendix R equivalency evaluations, apply to fire protection systems and components that support the approved fire protection program, including post fire safe shutdown capability, and may be used to support changes to the approved fire protection program (i.e., a GL 86-10 evaluation determines if a proposed change adversely affects safe shutdown).

3.7 NFPA CODE(S) OF RECORD

NFPA code and standards are often used as guidance for the design, installation, testing and maintenance of the fire protection system and administrative control elements. Commitments to NFPA codes that are applicable to the approved fire protection program are typically identified in the FPP, UFSAR, FHA, or equivalent documentation, and the NFPA "code of record" is usually the edition of the code that was current at the time of original design and installation, unless otherwise specified.

3.8 "NOT ADVERSELY AFFECT SAFE SHUTDOWN..."

Within the context of the standard fire protection license condition, the phrase "not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire," means to maintain an adequate level of fire safety to ensure that one train of equipment necessary to achieve hot shutdown from either the control room or emergency control stations is free of fire damage AND, that fire damage to at least one train of equipment necessary to achieve cold shutdown is limited such that it can be repaired using components stored onsite.

4 ASSUMPTIONS

This section provides the assumptions that underlie the performance of the FPPCRR.

4.1 NRC REGULATIONS AND GUIDANCE DOCUMENTS

Proposed changes that satisfy applicable regulatory requirements, guidance documents, or the fire protection licensing basis provide a sufficient level of fire protection safety and can be implemented without prior NRC approval.

EXCEPTION:

If original NRC acceptance of the feature being changed was based on a commitment to exceed a requirement or guidance document, then simply satisfying the original requirement and/or guidance document alone (i.e., meeting the minimum standard) should not be used to screen out a proposed change. In this case, further evaluation in accordance with Appendix A to this document, *Guidance for Performing GL 86-10 Evaluations*, may be warranted, as determined necessary by the licensee.

4.2 NFPA CODES AND STANDARDS

Applicable NFPA standards and codes current at the time of the proposed change are accorded the same status as NRC regulatory guides (Reference 7.1.1). Therefore, changes that satisfy applicable portions of current NFPA codes or standards, or the NFPA "code of record," are considered to satisfy NRC regulatory requirements or guidance documents.

4.3 NEI GUIDANCE DOCUMENTS

NEI guidance documents formally accepted by the NRC through the regulatory process are accorded the same status as NRC regulatory guides. Therefore, changes that satisfy NRC-endorsed NEI guidance documents are considered to satisfy NRC regulatory requirements or guidance documents. NEI guidance documents informally approved by NRC are considered good practices.

4.4 LICENSE CONDITION CHANGE

The proposed change does not result in a change to a license condition or technical specification.

4.5 SAFETY AND EFFECTIVENESS OF PROPOSED CHANGE

The proposed change will be determined to be safe and effective in accordance with the utility-specific process applicable to the change (i.e., design change process, procedure change process, UFSAR change process, etc.).

5 LIMITATIONS

5.1 PLANTS LICENSED PRIOR TO JANUARY 1, 1979

For plants licensed prior to January 1, 1979, the licensee should establish the threshold for requesting exemptions from the requirements of 10 CFR 50 Appendix R Sections III.G, III.J, III.L and III.O. In accordance with GL 86-10, Question 8.19, it is not necessary to file an exemption request for each and every deviation from Appendix R. Therefore, if a Generic Letter 86-10 or equivalent evaluation determines that a deviation does not adversely affect post-fire safe shutdown, then an exemption is typically not required. Examples are provided in Attachment 3 of this document.

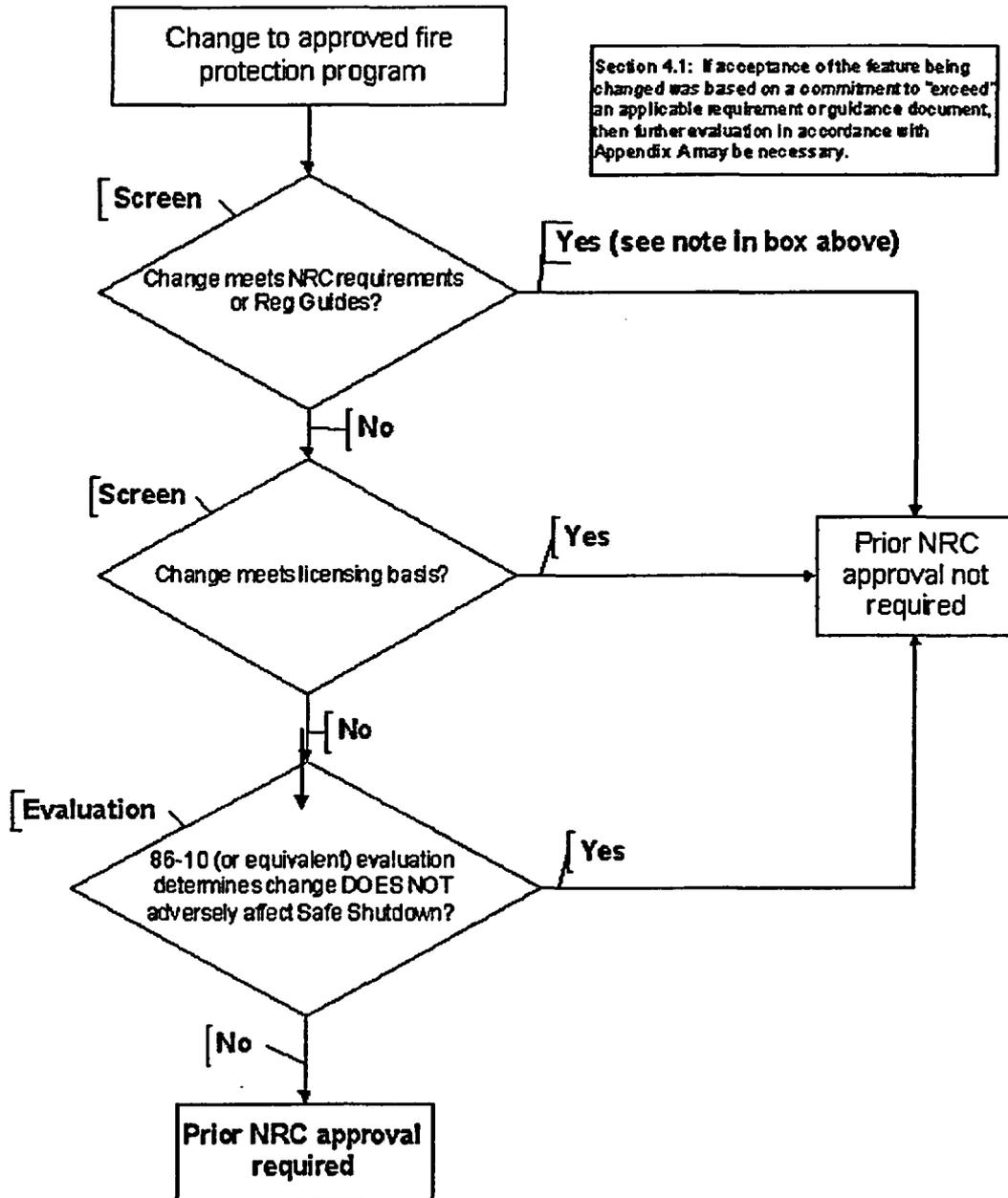
5.2 PLANTS LICENSED AFTER JANUARY 1, 1979

For plants licensed after January 1, 1979 that have committed to meet the requirements of 10CFR50 Appendix R Sections III.G, III.J, III.L and III.O or similar requirements (i.e., NUREG-0800) and are required to do so as a license condition; deviations from these requirements should be identified and justified, directly or by reference, in the FSAR or FHA.

5.3 DOCUMENTATION OF DEPARTURES FROM REGULATIONS

A departure from applicable NRC regulations and/or the licensing basis should be judged as part of a fire hazards analysis or engineering evaluation, the conclusion of which may be subject to subsequent review by the NRC inspector. Therefore, whether or not an exemption or deviation is requested, the evaluation and/or analysis performed to justify the change in accordance with this guidance should be maintained on file for future reference and inspection.

Fire Protection Change Regulatory Review Process Flow Chart



6 PROCESS

A fire protection engineer (FPE) should prepare or review changes to the fire protection program. The FPE should have the qualifications for membership in the Society of Fire Protection Engineers at the grade of member, or the licensee should otherwise establish the qualifications. (Reference: GL 82-21 Enclosure 1)

Determining if a change (i.e., design or administrative) to the approved fire protection program may be made without prior NRC approval is accomplished by completing Attachment 1, *Fire Protection Program Change Regulatory Review (FPPCRR)*. Attachment 1 provides a screening process intended to quickly identify and screen out those changes that cannot adversely affect the ability to achieve and maintain safe shutdown.

- If the proposed change satisfies applicable fire protection regulatory requirements or guidance documents, or satisfies the fire protection licensing basis, then a sufficient level of fire protection safety is provided and the change can be implemented without prior NRC approval.
- If the proposed change does not satisfy (or is not addressed in) applicable fire protection regulatory requirements or guidance documents, then further evaluation is required to determine whether the change would adversely affect the ability to achieve and maintain safe shutdown.

Note: If acceptance of the feature being changed was based on a commitment to "exceed" an applicable requirement or guidance document, then further evaluation may be necessary.

Attachment 1 provides optional guidance for evaluating the changes that do not screen out. If further evaluation is required, the preparer should document why the proposed change does not adversely affect the ability to achieve and maintain safe shutdown in Section 4 of Attachment 1, or should perform a Generic Letter 86-10 (or equivalent) evaluation in accordance with guidance provided in Attachment 1 and attach a copy to (or reference it in) the FPPCRR:

- If the evaluation concludes that there is not an adverse effect on safe shutdown, then this conclusion and its basis should be documented and be available for future inspection or reference.
- If the evaluation concludes that there is an adverse effect on safe shutdown, then prior NRC approval is required (or the proposed change should be altered to ensure it does not adversely affect the ability to achieve and maintain safe shutdown).

[Note: As a minimum, the evaluation should clearly explain why the change does or does not adversely affect the ability to achieve and maintain safe shutdown.]

7 REFERENCES

7.1 WRITERS' REFERENCES

- 7.1.1 NRC Regulatory Guide 1.189, *Fire Protection for Operating Nuclear Power Plants*
- 7.1.2 NEI 96-07, Revision 1
- 7.1.3 Generic Letter 86-10, *Implementation of Fire Protection Requirements*

7.2 NRC REQUIREMENTS AND REGULATORY GUIDES

- 7.2.1 See Reference 7.1.1 for a list of NRC fire protection related requirements and regulatory guides.

8 APPENDIX

Appendix A - Guidance for Performing GL 86-10 Evaluations

ATTACHMENT 1

Fire Protection Change Regulatory Review (FPPCRR)
Page 1 of 2

1. Station(s) / Unit(s): _____ Activity Document No: _____

2. Description:
Provide a brief description of, including the reason for, the proposed change (or refer to change package that provides description):

3. Screening:
Answer the following questions; include a reference to the applicable regulatory, licensing basis, or NFPA document(s), and a brief description of why the proposed change does or does not satisfy the referenced document(s).

Note: If acceptance of the feature being changed was based on a commitment to "exceed" an applicable requirement or guidance document, then further evaluation may be necessary.

A. Does the proposed change satisfy applicable fire protection regulatory requirements and/or guidance documents (i.e., GDC 3, 10CFR 50.48 and Appendix R, BTP Appendix A, NUREG 0800, NRC Generic Letters, NFPA Codes, or NRC-approved NEI guidance documents)?

- Yes
- No

Basis for Determination:

B. Does the proposed change satisfy the fire protection licensing basis (e.g., alternate compliance, exemption, deviation, SER, docketed correspondence, or NFPA Codes of Record)?

- Yes
- No

Basis for Determination:

Attachment 1
Fire Protection Change Regulatory Review (FPCRR)
Page 2 of 2

C. Is the answer to either question 3A or 3B "Yes"?

- Yes
 No

If yes, then the proposed change does not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire and NRC approval is not required. Check N/A on Step 4 and proceed to Step 5.

If no, then complete Step 4 (see Appendix A for additional guidance).

4. Evaluation:

Does the proposed change adversely affect the ability to achieve and maintain safe shutdown in the event of a fire (provide justification below or attach Generic Letter 86-10 type or equivalent evaluation)?

- Yes
 No

Basis for Determination:

If yes, then the proposed change may not be implemented without prior NRC approval.

If no, then the proposed change does not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire, and NRC approval is not required.

5. Conclusion:

- Proposed change may be implemented without prior NRC approval.
 NRC approval is required prior to implementing the proposed change.

6. I have determined that the documentation is adequate to support the above conclusion.

Preparer: _____ / _____ / _____

Print

Signature

Date

Reviewer: _____ / _____ / _____

Print

Signature

Date

ATTACHMENT 2

PROPOSED CHANGES THAT WOULD LIKELY SCREEN OUT

The following examples are proposed changes that would likely screen out from further review (and could be made without prior NRC approval) because the change meets NRC regulatory requirements, guidance documents, or the fire protection licensing basis:

- Any change that satisfies the NRC regulation, guidance documents, or the fire protection licensing basis. This screens out because a sufficient level of fire protection safety is maintained and, therefore, safe shutdown is not adversely affected.

Note: If acceptance of the feature being changed was based on a commitment to “exceed” an applicable requirement or guidance document, then further evaluation may be necessary.

- Replacing a fire rated component (i.e., penetration seal, door, wrap, etc.) with a different component having the same or greater fire rating. This screens out because there is no reduction in the original margin of safety provided by the component and, therefore, safe shutdown is not adversely affected.
- Changing the hose stream allowance for the fire protection water supply from 750 gpm to 500 gpm. This screens out because the hose stream allowance would satisfy the hose stream allowance requirements specified in NUREG-0800 (and the current edition of NFPA 13). Therefore, a sufficient level of fire protection safety is maintained, and safe shutdown is not adversely affected.
- Changing the surveillance frequency for fire protection equipment based on NFPA standards (i.e., current at the time of the change or code of record). This screens out because the surveillance frequency would satisfy that specified in the current edition of NFPA codes for providing reasonable assurance that the system or component is maintained in an operable condition. Therefore, a sufficient level of fire protection safety is maintained and safe shutdown is not adversely affected.
- Changing a surveillance frequency to deviate from applicable NFPA standards based on performance. Performance-based evaluations are recognized by the NRC and NFPA as acceptable alternative approach for optimizing surveillance frequencies. This screens out because a change supported by the performance-based evaluation provides reasonable assurance that the system or component is maintained in an operable condition and probable continuance of that condition until the next surveillance. Therefore, a sufficient level of fire protection safety is maintained and safe shutdown is not adversely affected.

Note: Performance based evaluations should be documented and be available for future reference and inspection.

- Establishing a new manual action to achieve or enhance post fire safe shutdown capability in accordance with NRC regulations or regulatory guidance. Therefore, this screens out because a sufficient level of fire protection safety is maintained and safe shutdown is not adversely affected.

NOTE: A rulemaking process is underway to address manual action feasibility and the need for prior NRC approval. Manual actions will need to address the regulations and guidance in effect at the time of the program change review to screen out.

- Adding a similar type and amount of hazard to an area already sufficiently protected for that type and amount of hazard. This screens out because a sufficient level of fire protection safety is maintained and, therefore, safe shutdown is not adversely affected.

ATTACHMENT 3

PROPOSED CHANGES THAT WOULD LIKELY REQUIRE FURTHER EVALUATION

The following examples are proposed changes that would likely not screen out from further review. Therefore further review (i.e., GL 86-10 evaluation) would be necessary to determine that safe shutdown is not adversely affected:

- Changing a fire area boundary and/or separation of redundant equipment within the same fire area (i.e., 20-ft separation, etc.) such that (1) it is not completely sealed floor-to-ceiling or wall-to-wall by fire-rated construction, or (2) it has fire-rated construction/components (i.e., penetration seal, door, wrap, etc.) for which the fire rating is less than that required by the regulation or the approved fire protection program.
- Evaluating a penetration seal that deviates from the tested configuration.
- Adding negligible quantities of intervening combustible material to an area crediting compliance with Appendix R Section III.G.2.b (or equivalent requirement). (Reference GL 86-10 Section 3.6.1).
- Changing the suppression or detection system from area-wide coverage to partial coverage.
- Crediting new manual actions that may not be obviously feasible (i.e., action is in area of fire within first hour of the fire, smoke migration, drifting suppressants, common ventilation systems, common drain systems or flooding, etc.).
- Changing a surveillance frequency such that it deviates from applicable NFPA codes and standards based on engineering judgment.
- Modifying an existing fire protection system to such that it deviates from (or changing the plant such that it results in a deviation from) the applicable NFPA code of record.
- Installing a new fire protection system that deviates from the applicable NFPA code.
- Changing fire protection program or administrative control requirements such that they deviate from applicable regulatory requirements and guidance documents, NFPA "codes of record," or the fire protection licensing basis (i.e., implementing procedures, compensatory measures, etc.)

- Adding a hazard to a room, zone, or area such that the fire protection features previously provided are not consistent with that specified in an NRC Regulatory Guide (i.e., adding an oil-filled transformer to the cable spreading room, etc.).
- Changing a fixed suppression system from automatic to manual.
- Changing the safe shutdown capability in an area from normal to alternate (i.e., alternative or dedicated) and not providing fire detection and fixed suppression in the room, zone, or area under consideration.
- Evaluating deviations associated with a Reactor Coolant Pump (RCP) Lube Oil Collection System (LOCS) that is seismically qualified and, therefore, subject to small random leaks (examples of deviations include oil sheen from droplets entrained in high air flow and deposited on surfaces outside the RCP LOCS, collection tanks that are not sized for the entire inventory of all RCPs, etc.).
- Crediting repairs (i.e., fuse removal, fuse replacement, jumpers, etc.) to achieve and maintain hot shutdown. Such repairs should be relatively simple to implement (i.e., take 20 minutes or less to complete), any necessary tools or materiel should be controlled and readily available, the time available to complete the repair should provide reasonable assurance of success, the repairs should be formalized in plant procedures, the shift staffing should be examined to ensure sufficient personnel are available, and the repair environment and the nature of the repair should not endanger plant personnel.
- Crediting the use of portable emergency lights in lieu fixed lighting. Such portable lighting should be controlled, readily available, and periodically checked for operability.
- Removing detection systems from areas having low combustible loading because the evaluation demonstrates that fire damage would be limited to a single safe shutdown train if a fire occurred and there was no detection.
- Crediting the use of portable fans (i.e., gas powered, etc.) to provide room cooling. Such equipment should be relatively simple to operate. In addition, such equipment should be controlled, readily available, and periodically checked for operability.
- Removing fixed suppression systems from the control room.
- Crediting water flow alarms in water suppression systems in lieu of fixed detection.
- Crediting essential AC lighting in lieu of emergency lighting units with at least an 8-hour battery power supply. The evaluation should demonstrate the essential AC lighting credited would be unaffected by the fire of concern.

- **Crediting DC emergency lighting with less than an 8-hour battery power supply. The evaluation should demonstrate that the power supply is sufficient to illuminate the required equipment and/or pathway when the equipment and/or pathway used.**
- **Not maintaining the process variables within those predicted for a loss of normal ac power. This is typically often credited for a Boiling Water Reactor (BWR) when employing rapid reactor pressure vessel depressurization as part of their alternative shutdown capability. This rapid depressurization could temporarily lower the vessel level below the core. The evaluation should demonstrate that the fuel rod cladding would remain intact, despite a temporarily depressed water level.**
- **Crediting alternate methods to read process variables (i.e., alternate equipment, gages, reading material, tables, etc.). The evaluation should demonstrate that the alternate methods could provide similar information. In addition, the alternate method should be controlled and readily available.**

ATTACHMENT 4 PROPOSED CHANGES THAT WOULD LIKELY REQUIRE PRIOR NRC APPROVAL

The following examples are proposed changes that would likely require prior NRC approval (because safe shutdown may be adversely affected):

- Any example in Attachment 3 for which a GL 86-10 evaluation concluded safe shutdown would be adversely affected.
- The proposed change requires a change to a license condition or technical specification, or otherwise involves a change to the license or technical specifications.
- Removing a suppression system from an area (not including the control room) crediting alternate (i.e., alternative or dedicated) shutdown capability (in accordance with Appendix R Section III.G.3).
- Changing the technical requirements to allow continued power operation without a primary or backup fire protection water supply.
- Crediting a repair to ensure the operability of a hot shutdown system.
- Reducing to below five the number of fire brigade members required on-site.
- Reducing shift staffing below the minimum necessary to achieve and maintain hot shutdown following a fire (based on site-specific analysis).
- Crediting an alternative (i.e., III.G.3) shutdown methodology (i.e., nonstandard system alignment) that would require more than 72 hours to achieve cold shutdown.

APPENDIX A

GUIDANCE FOR PERFORMING GL 86-10 EVALUATIONS

1 PURPOSE

This appendix provides guidance for the preparation and development of engineering evaluations to determine if changes resulting in a deviation(s) from applicable regulatory requirements, guidance documents, or the fire protection licensing basis are acceptable. The guidance may also be utilized to evaluate deviations from applicable NFPA codes. The guidance is consistent with the information contained in Generic Letter 86-10, *Implementation of Fire Protection Requirements*.

2 SCOPE

The guidance provided in this document may be used to analyze configurations associated with deviations from the approved fire protection program, including the fire protection and post fire safe shutdown systems, components, and strategies; administrative requirements and technical controls; organization; and other plant features associated with the program. Examples include, but are not limited to, the following:

2.1.1 Adequacy of Separation of Redundant Systems/Components Required for Post Fire Safe Shutdown

- A. Fire area, zone or room boundaries that (1) are not completely sealed floor-to-ceiling or wall-to-wall by fire-rated construction, or (2) have fire rated construction/components for which the fire rating is less than that required by the regulation or the approved fire protection program. Where fire boundaries are not wall-to-wall or floor-to-ceiling with all penetrations sealed to the required fire rating, the evaluation should assess the adequacy of the boundaries to determine if they will withstand the hazards associated with the area and protect important equipment from a fire outside the area. (Reference GL 86-10, Enclosure 1, Item 4 and Questions 3.1.1 and 3.1.2)
- B. Passive fire-rated components (i.e., penetration seals, fire wraps, structural steel fire proofing, etc.) that deviate from the design and/or tested configuration, including test acceptance criteria. (Reference GL 86-10 Questions 3.2.1, 3.2.2, and 3.3)
- C. Active fire-rated components (i.e., doors, dampers, etc.) that deviate from the design and/or tested configuration. (Reference GL 86-10, Question 3.2.3)

- D. The adequacy of the separation provided between normal shutdown equipment and alternate shutdown capability located within the same area (Reference GL 86-10, Enclosure 1, Item 6).
 - E. The significance of combustible materials present (i.e., intervening combustibles) located between redundant shutdown divisions that are not separated by rated fire barriers (i.e., spatial separation). (Reference GL 86-10 Questions 3.6.1, 3.6.2, and 3.6.3)
- 2.1.2 The adequacy of suppression and detection systems, including partial coverage protecting safe shutdown cables and equipment and associated non-safety circuits of redundant trains. (Reference GL 86-10, Enclosure 1, Item 5, and Questions 3.4.2, 3.4.3, and 3.4.4)
 - 2.1.3 The feasibility of performing local manual actions in potentially adverse environments produced by the fire (i.e., environments may be adverse due to the hot gas layer, smoke, drifting suppressants, common ventilation systems, common drain systems, or flooding). (Reference GL 86-10 Questions 3.1.5 and 3.8.4)
 - 2.1.4 Deviations from applicable NFPA codes and standards. (Reference GL 86-10 Questions 3.8.1, 8.9)
 - 2.1.5 Fire protection program or administrative control requirements that deviate from applicable regulatory requirements and guidance documents, applicable NFPA codes and standards, or the fire protection licensing basis (i.e., implementing procedures, compensatory measures, surveillance methods and frequencies, etc.).

3 LIMITATIONS

- 3.1 The process for preparing technical evaluations should be performed in accordance with the licensee's engineering program (or similar program).
- 3.2 A FPE should perform or review the technical evaluation. In addition, if determined necessary by the FPE, a systems engineer should assist with the evaluation. (Reference GL 86-10, Enclosure 1, Item 4). The general qualifications for a fire protection engineer are described in Generic Letter 82-21.
- 3.3 Technical evaluations must be available for NRC review during audits or inspections (Reference GL 86-10, Enclosure 1, Items 4 and 5).
- 3.4 Though not required, another aspect to consider for the evaluation is risk informative insights, particularly those situations or configurations that may impact the existing Probabilistic Risk Assessment and shutdown risk models. Contemplated plant modifications or other changes may not be cost beneficial and have no impact on decreasing the fire risk.

- 3.5 Risk-informed, performance-based approaches such as those outlined in NFPA 805 may be used to support the Generic Letter 86-10 evaluation.

4 REFERENCES

- 4.1 Branch Technical Position APCSB 9.5-1, *Guidelines for Fire Protection for Nuclear Power Plants*, dated May 1, 1976.
- 4.2 Branch Technical Position CMEB 9.5-1, *Guidelines for Fire Protection for Nuclear Power Plants*, Rev. 2, dated July, 1981.
- 4.3 10 CFR 50 Appendix R, *Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979*, to 10 CFR 50, effective date February 17, 1981.
- 4.4 Generic Letter 86-10, *Implementation of Fire Protection Requirements*, April 24, 1986.
- 4.5 Generic Letter 86-10, Supplement 1, *Fire Endurance Test Acceptance Criteria for Fire Barrier Systems Used to Separate Redundant Safe Shutdown Trains Within the Same Fire Area*, dated March 25, 1994.
- 4.6 10 CFR 50 Appendix A, Chapter 1, General Design Criteria, *Criterion 3-Fire Protection*, January 1, 1988 Edition.
- 4.7 Generic Letter 82-21, *Technical Specifications for Fire Protection Audits*.
- 4.8 Generic Letter 88-12, *Removal of Fire Protection from Technical Specifications*, dated August 2, 1988.
- 4.9 NFPA 805, *Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants*, 2001 Edition.

5 DEFINITIONS AND ACRONYMS

5.1 Abbreviations and Acronyms

APCSB	Auxiliary and Power Conversion Systems Branch
BTP	Branch Technical Position
CMEB	Chemical Engineering Branch
FHA	Fire Hazards Analysis
GL	Generic Letter
NFPA	National Fire Protection Association
NRC	Nuclear Regulatory Commission
PRA	Probabilistic Risk Assessment
SSA	Safe Shutdown Analysis

5.2 Free of Fire Damage

The structure, system, or component under consideration is capable of performing its intended function during and after the postulated fire, as needed. It may perform this function automatically, by remote control (which includes manual operations and remote manual operations) or by local operation. (Reference NEI 00-01, *Guidance for Post-Fire Safe Shutdown Analysis*)

6 EVALUATION CRITERIA AND CONSIDERATIONS

6.1 Acceptance Criteria

6.1.1 The minimum acceptance criteria for accepting a change that deviates from applicable regulatory requirements and guidance documents, or the fire protection licensing basis, are:

- A sufficient level of fire protection safety is maintained to ensure that one train of equipment necessary to achieve hot shutdown from either the control room or emergency control stations is free of fire damage, and
- Fire damage to at least one train of equipment necessary to achieve cold shutdown is limited such that it can be repaired within a reasonable time (minor repairs with components stored on-site).

6.1.2 Additional criteria that may be considered include whether or not the actions (i.e., modifications) necessary to achieve literal compliance would significantly improve safety or would be detrimental to inherent safety features.

6.2 General Methodology

When fire protection features are evaluated, the postulated fire in the Fire Hazard Analysis for the area, zone, or room affected by the change should be considered, and the overall protection scheme should be kept in perspective. The defense-in-depth principles of the fire protection program provide an adequate balance between the different features. Strengthening any one can compensate for weaknesses in others.

6.3 Adequacy of Separation of Redundant Systems/Components Required for Post Fire Safe Shutdown

When evaluating the adequacy of a fire barrier, the fire areas, zones, or rooms on each side of the barrier are to be individually analyzed for the impact of a fire on either side of the barrier on the redundant safe shutdown capability, including the likely spread of fire. The effectiveness of the barrier should be evaluated to demonstrate the adequacy of a barrier commensurate with the fire hazards in the area. A specific description of the fire protection features in the areas, zones, or rooms being analyzed is required to justify the change. Low fire loading alone is not a sufficient basis for the evaluation. If it is determined that each fire barrier of concern is capable of protecting the safe shutdown

equipment/cables protected by the barrier (i.e., within and/or adjacent to the opposite side of the barrier), the analysis and justification for the acceptability of the fire barrier shall be documented.

6.3.1 If evaluating passive fire-rated components, the evaluation should determine, as a minimum, that:

- The temperature on the unexposed side of the barrier is sufficiently below the ignition temperature of the penetrating items
- The continuity and thickness of the fire barrier material is maintained
- The nature of the support assembly is equivalent to the tested configuration
- The application or "end use" of the fire barrier is unchanged from the tested configuration. For example, the use of structural steel fire proofing to protect a cable tray assembly may not be acceptable

6.3.2 If evaluating active fire rated components, then the evaluation should determine if the component provides an adequate level of separation considering the fire loading on both sides.

6.3.3 If evaluating the significance of combustible materials (e.g., type, quantity, distribution, etc.) located between redundant shutdown divisions that are not separated by rated fire barriers (i.e., intervening combustibles), then the evaluation should consider the following factors to determine whether circuits or components, including associated circuits required for safe shutdown, could be adversely affected or whether a new hazard / element is being introduced:

- The horizontal spatial separation between redundant divisions.
- Cable qualification (IEEE-383).
- The presence of an automatic fire suppression system over the intervening combustible.
- The likely fire propagation direction of burning intervening combustibles in relation to the location of the vulnerable shutdown division.
- The availability of other active and passive compensating fire protection features provided.

Note: For fire protection, "no intervening combustibles" means that there are not significant quantities of in-situ materials that will ignite and burn located between redundant shutdown systems. "Significant quantity" is a judgmental criterion, and the judgment of whether or not intervening combustibles are significant should be made by a fire protection engineer and documented (for later NRC audit).

6.4 Suppression and Detection System Coverage

When evaluating the adequacy of partial suppression and/or detection coverage, the hazards in the fire areas, zones, or rooms of concern should be considered. The effectiveness of the system should be judged based on the location of the system components (i.e., detector, sprinklers, etc.) relative to the hazards, including the likely spread of fire, and should determine whether or not the system is commensurate with the fire hazards in the area. A specific description of the fire protection features in the areas, zones, or rooms being analyzed is required to justify the change. Low fire loading alone is not a sufficient basis for the evaluation.

6.5 Manual Action Feasibility Evaluation Methodology

When assessing feasibility of performing manual actions for post fire safe shutdown activities, the evaluation should consider associated manpower and time constraints, communication, adequacy of emergency lighting, the need for procedural guidance or additional training considering operator familiarity, and the accessibility to the equipment in the anticipated environment considering the potential exposure effects of fire, heat, smoke, and suppressants. Refer to Appendix E, Manual Actions and Repairs, of NEI 00-01, *Guidance for Post-Fire Safe Shutdown Analysis*, for additional insights that may be considered.

6.6 NFPA Code Deviations

As a minimum, applicable NFPA code deviations should be evaluated and justified by a qualified fire protection engineer based on engineering judgment. Guidance, considerations, and criteria provided throughout this document may be utilized when determined to be applicable by the evaluating engineer.

6.7 Administrative Controls

6.7.1 If changing a preventive maintenance or surveillance procedure method and/or frequency, the evaluation should ensure the change provides reasonable assurance that the associated system, feature, or component is maintained in full operating condition (and to indicate probable continuance of that condition until the next performance of that procedure). Vendor guidance, NFPA guidance, fire protection engineering judgment, and/or actual performance should be considered.

6.7.2 If changing a specified compensatory measure, then the evaluation should ensure the proposed compensatory measure provides reasonable assurance that post-fire safe shutdown capability is preserved when the compensatory measure is established.

6.8 Evaluation Format

6.8.1 A recommended (not required) format for the technical evaluation is described in Attachment 1 to this Appendix.

6.8.2 The technical evaluation should be structured to address the specific technical issue.

6.8.3 The information contained within each evaluation may vary on a case-by-case basis depending upon the condition being evaluated. It is not necessary to include all features or information shown in Attachment 1, but only those which are relevant to the particular evaluation as determined by the evaluating engineer. For example, an evaluation of suppression, detection, or barriers would not require a description on emergency lights. However, when addressing accessibility to perform manual actions, emergency lighting features should be included as a minimum.

ATTACHMENT 1 TO APPENDIX A EVALUATION FORMAT

1 PURPOSE

This section provides a statement which identifies why the technical evaluation is being performed.

2 SCOPE

This section describes and limits the scope of fire protection features applicable to the evaluation.

3 LICENSING AND DESIGN BASES

This section should list all the licensing and design documents related to the evaluation.

- 10 CFR 50 Appendix R
- BTP (APCSB or CMEB) 9.5-1
- Licensee/NRC correspondence
- Other generic NRC correspondence
- NFPA codes and standards
- SERs, exemptions/deviations
- Other evaluations such as GL 86-10 evaluations

4 REFERENCES

Identify all applicable documents used in the evaluation. If references are not used, then indicate "None."

5 DEFINITIONS

List of clarifications for terms; acronyms used in the evaluation.

6 EVALUATION METHODOLOGY AND RESULTS

6.1 Description

This section identifies the configurations being evaluated. It includes a description of the fire area boundary for the fire zone(s) and fire area(s) of concern. It also describes the relationships of these zone(s) and fire area(s) to each other and to other fire zones making up the fire areas. In the case of a non-rated fire barrier feature, the description should

include the construction characteristics of the fire area boundary being evaluated. The description may also include, as necessary, relevant information concerning barrier construction (walls, floor, ceiling), ceiling height, room volume, ventilation, and congestion.

6.2 Assumptions

This section should include all assumptions while performing the evaluation. If assumptions have not been utilized, then "None" should be noted in this section.

6.3 Safe Shutdown Capability

This section identifies the safe shutdown capabilities in the fire zone(s)/fire area(s) of concern. This section includes safe shutdown cables and equipment and/or safe shutdown systems and/or plant operating conditions that are affected or lost due to a fire in the fire zone(s)/fire area(s) of concern. This section may also include, as necessary:

- An analysis of redundant safe shutdown components in the area,
- Impact on the capability to repair cold shutdown equipment,
- Type of equipment/cables involved,
- The availability of alternate shutdown capability,
- Any special features such as: cable wraps, radiant energy shield, separation between components and concentration of combustibles, procedural manual actions, etc., and
- Fire barriers in the area of interest

6.4 Fire Protection Equipment

The section identifies the automatic and manual fire protection equipment in the fire zone(s)/fire area(s) of concern.

- Fire detection systems
- Fire suppression systems
- Hose stations/fire extinguishers.

6.5 Fire Hazards Analysis

This section identifies and evaluates the impact of the postulated fire scenario on the safe shutdown capabilities in the fire zone(s)/fire area(s) of concern. This section includes, as necessary, the following information:

- Type and continuity of combustibles.
- Ease of ignition and propagation.
- Likely direction of fire propagation.
- Heat release potential and equivalent fire severity.

- Whether the area is continuously manned.
- Traffic through the area.
- Accessibility of the area.
- Spatial separation distances.
- Role of fire detection and suppression systems.
- Suppression effects or damage to equipment.
- Availability of compensating actions (e.g., fire brigade) and passive fire protection (e.g., fire barriers, construction features, fire wraps).
- Fixed ignition sources.
- Combustible controls.
- Proximity of ignition sources to combustibles and equipment important to safety.

The likely spread of fire is examined against the stated purpose of the technical evaluation. The consequences of fire spread are examined to determine if it will result in an unsafe plant condition or affect safe shutdown. If it is determined that fire spread may adversely affect the ability to achieve and maintain safe shutdown, then the proposed change should not be implemented absent appropriate compensatory measures or prior NRC approval. If it is determined that the fire's spread will not have an impact, then the evaluated item or condition is acceptable.

The examinations generally review fire spread from one area/zone to another or into multiple areas (e.g., through a non-rated barrier, across a proposed "safe" separation distance within a fire area, or through fire areas with no or partial fire detection and/or suppression systems). When it is determined that the fire can spread from one area of concern to another, then the impact on redundant safe shutdown capability is analyzed.

6.6 Conclusion

This section summarizes the bases for determining that the evaluated item does or does not have an adverse impact on post fire safe shutdown capabilities, or if additional actions are proposed to improve the protection features.

6.7 Attachments (as required)

This section provides a listing of any attachments needed to support the technical evaluation.