

## ATTACHMENT 71111.05T

INSPECTABLE AREA: Fire Protection (Triennial)

CORNERSTONE: Initiating Events  
Mitigating Systems

EFFECTIVE DATE: January 1, 2010

INSPECTION BASES: Fire can be a significant contributor to reactor risk. In many cases, the risk posed by fires is comparable to or exceeds the risk from internal events. The fire protection program shall extend the concept of defense in depth (DID) to fire protection in plant areas important to safety by:

- (1) preventing fires from starting;
- (2) rapidly detecting, controlling, and extinguishing fires that do occur; and
- (3) providing protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by fire suppression activities will not prevent the safe shutdown (SSD) of the reactor.

Licensees are also expected to take reasonable actions to mitigate postulated events that could potentially cause loss of large areas of power reactor facilities due to explosions or fires. Interim Compensatory Measures Order EA-02-026 spanned a wide range of security-related actions required to be taken by power reactor licensees in response to the events of September 11, 2001. Section B.5.b of the Order dealt specifically with these postulated events. In response to this Order (and the subsequent requirements of 10 CFR 50.54 (hh)(2)) licensees implemented alternative mitigating strategies intended to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities under such circumstances. These are collectively referred to as B.5.b requirements.

LEVEL OF EFFORT: Every 3 years, an inspection team that includes inspectors who are knowledgeable in the areas of fire protection, reactor operations, and electrical inspections will conduct a design-based, plant-specific, risk-informed, onsite inspection of the DID elements used to mitigate the consequences of a fire. The review will include an assessment of the licensee's capability of

problem identification and resolution of fire protection issues.

In addition, every 3 years inspectors trained to review alternative mitigating strategies should review several mitigating strategies to ensure they remain feasible. Additionally, inspectors should review the storage, maintenance, and testing of B.5.b related equipment.

**CHANGES IN SCOPE:** For triennial inspections starting March 2006, the scope of this procedure has been changed to integrate inspection guidance for operator manual actions associated with licensee-initiated compensatory measures while the underlying performance deficiency (e.g. failure to meet the requirements of 10 CFR Part 50, Appendix R, Section III.G.2 or other plant specific licensing requirements) are corrected. The background, objectives, and specific guidance are provided in Section 02.02.11B of this document.

## 71111.05-01 INSPECTION OBJECTIVES

01.01 The inspection team will evaluate the design, operational status, and material condition of the licensee's fire protection program by verifying that the licensee's program includes:

- a. adequate controls for combustibles and ignition sources inside the plant ;
- b. adequate fire detection and suppression capability;
- c. passive fire protection features in good material condition;
- d. adequate compensatory measures for out-of-service, degraded or inoperable fire protection equipment, systems, or features;
- e. procedures, equipment, fire barriers, and systems that ensure the post-fire capability to safely shut down the plant; and
- f. feasible and reliable manual actions when appropriate to achieve SSD

Inspection Procedure 71111.05AQ, Fire Protection (Annual/Quarterly) is designed to complement the triennial inspection in the areas of fire brigade capability and water supply and delivery system maintenance and adequacy. However, the team should consider the need for additional inspections in these areas based on previous assessments and potential issues.

01.02 Verify that B.5.b mitigating strategies are feasible in light of operator training, maintenance of necessary equipment, and any plant modifications.

## 71111.05-02 INSPECTION REQUIREMENTS

### 02.01 Inspection Preparation

- a. Every 3 years, an inspection team will select three to five risk-significant fire areas or zones (depending on the teams makeup, scope, and resources) and conduct risk-informed inspections of selected aspects of the licensee's fire protection program. The team may adjust the number of fire areas inspected during the inspection based on the complexity of issues.

The initial selection of areas to be inspected should be based on inputs from a senior reactor analyst (SRA), a fire protection specialist and an electrical engineer. For each area the selection process will consider but will not be limited to the following:

1. A review of the fire hazard analyses
2. Potential ignition sources
3. The configuration and characteristics of combustible materials
4. Routing of circuits important to accomplish and maintain safe shutdown condition
5. The licensee's fire protection and fire fighting capability
6. The licensee's use of operator manual actions

The inspection should focus on post-fire safe shutdown capability and should inspect alternative or dedicated shutdown capability, as applicable.

- b. As part of the team's inspection of fire protection issues, a review of B.5.b Mitigating Strategies should also be performed. The team should select one or more strategies to review; and part of this review should include a review of the storage, maintenance, and testing of B.5.b related equipment. When determining which strategies and equipment to review, the team should consider:

1. Strategies for which the licensee has modified the regulatory commitment since the last performance of this inspection (or the performance of TI 2515/171). Any such strategies should be the main focus of the inspection effort.
2. Complexity of the strategies.
3. Risk significance of the strategies.
4. Strategies from different categories. For the purpose of this inspection the

mitigating strategies are broadly characterized as fire fighting, command and control, spent fuel pool (SFP), and reactor and containment related.

02.02 Fire Protection Inspection Activities. The inspection guidance is designed to verify that the systems required to achieve and maintain post-fire SSD are capable of controlling reactivity, reactor coolant makeup, reactor heat removal, process monitoring, and to support associated system functions, and that the licensee's engineering and licensing documents (e.g., NRC guidance documents, license amendments, safety evaluation reports (SERs), exemptions, deviations) support the selection of the designated systems and equipment.

The verification of fixed fire protection systems, including the installation, design, and testing of the systems, and their adequacy to control and/or suppress fires in each selected area, will be done against the code of record.

If a fire brigade drill is observed, the inspection team should consider the lines of inspection inquiry outlined in IP71111.05AQ.

Manual actions not part of an NRC approved exemption or deviation used in lieu of one of the means specified in Appendix R, Section III.G.2 to ensure one of the redundant trains is free of fire damage will be accepted only as temporary compensatory measures and therefore will be evaluated using guidance provided in paragraph 02.02j.2 of this document.

If one of the redundant trains in the same fire area is free of fire damage by one of the specified means in paragraph III.G.2, then the use of operator manual actions, or other means necessary, to mitigate fire-induced operation or mal-operation to the second train may be credited without prior approval.

a. Protection of Safe Shutdown Capabilities.

Verify that the fire protection features in place to SSD capability, including power, control, and instrumentation cables, satisfy the separation and design requirements (for pre-1979 plants Section III.G of Appendix R, and for reactor plants reviewed under the Standard Review Plan, license specific separation requirements).

b. Passive Fire Protection.

Verify through observation of material conditions that the fire ratings of fire area boundaries, raceway fire barriers, and equipment fire barriers meet the requirements for the fire hazards in the area.

Verify through review of installation or repair records that material of an appropriate fire rating (equal to the overall rating of the barrier itself) has been used to fill openings and penetrations and that the installation meets engineering design.

Verify through review of installation or repair records that material of an appropriate fire rating has been used as fire protection wraps and that the installation meets engineering design.

For unusual installation configurations and/or application of unusual materials verify appropriate fire test data.

c. Active Fire Protection.

Verify and review the material condition, operational lineup, functionality, and design of fire detection systems, fire suppression systems, and manual fire fighting equipment.

Verify that detection, and automatic and manual suppression systems are installed, tested, and maintained in accordance with the code of record and would adequately control and/or extinguish fires associated with the hazards of each selected area.

Verify that the design capability of suppression agent delivery systems meet the requirements of the fire hazards.

d. Protection From Damage From Fire Suppression Activities.

Verify that redundant trains of systems required for hot shutdown, which are located in the same fire area, are not subject to damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems, and that the licensee has addressed each of the following:

1. A fire in a single location that may, indirectly, through the production of smoke, heat, or hot gases, cause activation of automatic fire suppression that could potentially damage all redundant trains;
2. A fire in a single location (or inadvertent manual or automatic actuation, or rupture of a fire suppression system) that may indirectly cause damage to all redundant trains (e.g., sprinkler-caused flooding of other than the locally affected train).
3. Adequate drainage is provided in areas protected by water suppression systems.

e. Alternative Shutdown Capability.

1. Methodology.

Verify that the licensee's alternative shutdown methodology has properly identified the systems and components necessary to achieve and maintain SSD conditions for each fire area, room or zone selected for review. Specifically determine the adequacy of the systems selected for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring and support system functions.

Verify the licensee's engineering and/or licensing justifications (e.g., NRC guidance documents, license amendments, SERs, exemptions, deviations)

support the required performance criteria of the selected systems and components.

Verify that hot and cold shutdown from outside the control room can be achieved and maintained with or without the availability of off-site power **for fires in areas where post-fire SSD relies on manipulating shutdown equipment from outside the control room.**

Verify that the transfer of specified plant control functions from the control room to the alternative location(s) has been demonstrated without being affected by fire-induced circuit faults (e.g., by the use of separate fuses and power supplies for alternative shutdown control circuits).

2. Operational Implementation.

Verify that the training program includes an evaluation of alternative or dedicated safe shutdown capability for licensed and non-licensed personnel.

Verify that personnel required to place and maintain the plant in hot shutdown following a fire using the alternative dedicated shutdown system are properly trained and are available at all times from onsite shift staff, exclusive of the fire brigade.

Verify that adequate procedures for use of the alternative shutdown system are in place.

Verify that human factors attributes were addressed in the development of the alternative shutdown procedures (e.g., placement and accessibility of equipment, environmental conditions, etc.). Consider conducting a walk down of the procedure step by step paying special attention to the human factors elements.

Verify that the operators can reasonably be expected to perform and complete the instructions of the procedures within applicable shutdown time requirements. - see Section 11 B

Verify that the licensee conducts periodic operational tests of the alternative shutdown transfer capability and instrumentation and control functions, and the tests are adequate to prove the functionality of the alternative shutdown capability.

f. Circuit Analyses.

Verify that the licensee has identified structures, systems, and components (SSCs) important to SSD and their demonstrated compliance with 10 CFR Part 50.48.

Verify for the selected areas that the licensee has performed a post-fire SSD analysis.

Review specific process and instrumentation diagrams (P&IDs) for flow diversions, loss of coolant, or other scenarios which could adversely affect the nuclear power plants capability to achieve and maintain hot shutdown. Verify that the licensee's analysis identified and considered such processes and circuits, and that the analysis has shown that hot shorts, and/or shorts to ground will not prevent SSD.

Verify that the circuit analysis considered the following for the areas being evaluated:

1. Cable failure modes.

(a) For any single thermoplastic or thermoset multiconductor cable (including armored), review any combination of conductors within the cable (e.g. intra-cable) for which a short will cause spurious actuation(s). Inspectors should review 3 or 4 of the most critical combinations.

(b) For any 2 adjacent thermoplastic cables, review any combination of conductors between the two cables for which a short will cause spurious actuation(s). Inspectors should review 3 or 4 of the most critical combinations.

(1) A maximum of two cables should be evaluated for cases where multiple cables may be damaged by the same fire. Multiple spurious actuations may be evaluated, depending on the number of conductors, and the circuit configuration.

(2) For cases involving direct current (DC) control circuits, consider the potential spurious operation due to failures of the control cables (even if the spurious operation requires two concurrent hot shorts of the proper polarity, e.g., plus-to-plus and minus-to-minus). Consider potential spurious actuations when the source and the target conductors are in two independent multiconductor cables.

(3) For cases involving decay heat removal (DHR) system isolation valves at high-pressure and low-pressure interfaces verify that the three-phase power cables to the valves (either thermoset or thermoplastic jacketed) are not vulnerable to three-phase proper polarity hot shorts.

2. Common Power Supply/Bus Concern. Verify, on a sample basis, that circuit breaker coordination and fuse protection have been analyzed, and are capable of protecting the power source of the designated redundant or alternative safe shutdown system/equipment.

g. Communications.

Verify through inspection of the contents of designated emergency storage lockers and review of emergency control station alternative shutdown procedures, that portable radio communications and/or fixed emergency communications systems are available, operable, and adequate for the performance of the designated activities. Assess the capability of the communication systems to support the operators in the conduct and coordination of their required actions (e.g., consider ambient noise levels, clarity of reception, reliability, and coverage patterns). If specific issues arise relating to alternative or dedicated shutdown communications adequacy, then, observe a licensee conducted communications test in the subject plant area or areas.

Verify that communication equipment such as repeaters, transmitters etc. would not be affected by a fire.

h. Emergency Lighting.

Review emergency lighting provided, either in fixed or portable form, along access routes and egress routes, at control stations, plant parameter monitoring locations, and at manual operating stations:

1. If emergency lights are powered from a central battery or batteries, verify that the distribution system contains protective devices so that a fire in the area will not cause loss of emergency lighting in any unaffected area needed for safe shutdown operations.
2. Verify that battery power supplies are rated with at least an 8-hour capacity.
3. Verify the operability testing and maintenance of the lighting units follow licensee procedures and accepted industry practice.
4. Verify that sufficient illumination is provided to permit access to and verification of components for the monitoring of safe shutdown indications and/or the proper operation of SSD equipment.
5. Verify that emergency lighting unit batteries are being maintained consistent with the manufacturer's recommendations.

i. Cold Shutdown Repairs.

Verify that the licensee has repair procedures, equipment, and materials to accomplish repairs of components required for cold shutdown which might be damaged, that these components can be made operable, and that cold shutdown can be achieved within the required time frames. Verify that the repair equipment, components, tools, and materials (e.g., pre-cut cable connectors with prepared attachment lugs) are available and accessible on site.

j. Compensatory Measures.



1. General guidance. Verify that compensatory measures are in place for out-of-service, degraded, or inoperable fire protection and post-fire safe shutdown equipment, systems, or features (e.g. detection and suppression systems and equipment, passive fire barriers, or pumps, valves or electrical devices providing safe shutdown functions or capabilities). Short term compensatory measures should compensate for the degraded function or feature until appropriate corrective action can be taken. Review the licensee's effectiveness in returning the equipment to service in a reasonable period of time (typically days or weeks).

If the licensee meets the requirements in 10 CFR Part 50 Appendix R, Section III.G.2, then the use of operator manual actions to mitigate fire-induced operation or mal-operation to the second train may be credited without prior approval.

2. Manual Actions. The three acceptable methods that meet the requirement for maintaining one of the redundant trains in the same fire area free of fire damage are based on the combination of physical barriers, spatial separation, fire detection and automatic suppression systems. These methods are described in 10 CFR Part 50 Appendix R, Section III.G.2. Licensee implemented manual actions to respond to potential maloperations that may result from the failure to meet this requirement do not correct the underlying performance deficiency and therefore will not be accepted as final corrective action. However, the staff concluded that for an interim period, while appropriate corrective actions are implemented or while preparations are made by the licensee to submit exemptions or deviations, compensatory measures in the form of manual actions may be acceptable if the manual actions meet the criteria provided below.

If the inspectors determine that the manual actions cannot be reasonably accomplished and therefore implementation may lead to an unsafe plant condition, alternate compensatory measure(s) or temporary corrective action(s) must be implemented.

- (a) Applicability. This guidance is provided for assessing manual actions implemented in conjunction with a licensee commitment to Section III.G.2.

Verify that the licensee is committed to meet the requirements of Section III.G.2. Determine whether the requirements are met with or without the use of manual actions. If manual actions are not invoked, this guidance is not applicable.

If manual actions were previously approved by the staff and an exemption or deviation has been issued, verify that the licensee continues to meet the terms of the exemption or deviation.

- (b) Diagnostic Instrumentation. Verify that adequate diagnostic instrumentation, unaffected by the postulated fire, is provided for the operator to detect the specific spurious operation that occurred. Some licensees may have protected only the circuits specified in Information Notice 84-09. Additional instrumentation may be needed to properly assess a spurious operation. Annunciators, indicating lights, pressure gages, and flow indicators are among the instruments typically not protected from the effects of a fire. Instrumentation should also be available to verify that the manual action accomplished the intended objective.
- (c) Environmental Considerations. Evaluate environmental conditions the operators may encounter while traveling to the area where the manual action will be performed and within the area where the manual action will take place. The conditions to be verified may include the following:
  - (1) Radiation levels shall not exceed normal 10 CFR Part 20 limits.
  - (2) Emergency lighting is provided as required in Appendix R, Section III.J, or by the licensee's approved fire protection program.
  - (3) Temperature and humidity conditions are such that they do not affect the operator's ability to perform the manual action.
  - (4) Fire effects such as smoke and toxic gases do not affect the operator's ability to perform the manual action.
- (d) Staffing. Evaluate licensee shift staffing to determine whether enough qualified personnel are available to perform the required manual actions and to safely operate the reactor.
- (e) Communications. Verify that manual action coordination with other plant operations can be accomplished, and that communications capability is protected from effects of a postulated fire.
- (f) Special Tools. Evaluate the need for special tools and verify that such tools are dedicated and readily available.
- (g) Training. Verify that operator training on the manual actions and the associated procedure(s) is adequate and current.
- (h) Accessibility. Evaluate the accessibility of tools and equipment. If special access equipment is needed (such as a ladder), verify the availability of the equipment. Verify that an operator can reach the required location without personal hazard.
- (i) Procedures. Review procedural guidance to ensure that it is adequate

and given in an emergency procedure. Operators should not rely on having time to study normal plant procedures to find a method of operating plant equipment that is seldom used.

- (j) Verification and Validation. Determine whether the manual actions have been verified and validated by plant walkdowns using the current procedure. Ensure that the licensee has adequately evaluated the capability of operators to perform the manual action in the time available before the plant will be placed in an unrecoverable condition.

02.03 B.5.b Inspection Activities. Review one sample of the licensee's preparedness to handle large fires or explosions by reviewing one or more mitigating strategies. This review should verify that the licensee continues to meet the requirements of their B.5.b related license conditions and 10 CFR 50.54 (hh)(2) by determining that:

- a. Procedures are being maintained and adequate.
- b. Equipment is properly staged and is being maintained and tested.
- c. Station personnel are knowledgeable and can implement the procedures.

02.04 Identification and Resolution of Problems. The team should verify that the licensee is identifying issues related to this inspection area at an appropriate threshold and entering them in the corrective action program. For a sample of selected issues documented in the corrective action program, verify that the corrective actions are appropriate. See Inspection Procedure 71152, "Identification and Resolution of Problems," for additional guidance.

## 71111.05-03 INSPECTION GUIDANCE

### 03.01 Inspection Preparation.

- a. Inspection Team. The team assigned to conduct the multi-disciplinary triennial fire protection inspection should include **inspectors who are knowledgeable in the areas of** reactor operations, electrical **inspections**, and fire protection.
  - 1. Reactor Operations. The **inspector knowledgeable in this area** will assess the capability of reactor and balance-of-plant systems, equipment, operating personnel, and procedures to achieve and maintain post-fire safe shutdown and minimize the release of radioactivity to the environment in the event of fire. Therefore, the inspection team leader will ensure that the **inspector** is knowledgeable regarding integrated plant operations, maintenance, testing, surveillance and quality assurance, reactor normal and off-normal operating procedures, and BWR and/or PWR nuclear and balance-of-plant systems design.
  - 2. Electrical **Inspections**. The **inspector knowledgeable in this area** will identify electrical separation requirements for redundant train power, control, and instrumentation cables. The **inspector** will review alternative shutdown panel

electrical isolation design to establish the panel's' electrical independence from postulated fire areas. Therefore, the inspection team leader will ensure that the **inspector** is knowledgeable regarding reactor plant electrical and instrumentation and control (I&C) design and is familiar with industry ampacity derating standards.

3. Fire Protection. The **inspector knowledgeable in this area** will work with other team members in determining the effectiveness of the fire barriers and systems that establish the reactor plant's post-fire SSD configuration and maintain it free of fire damage. The **inspector** will determine whether suitable fire protection features (suppression, separation distance, fire barriers, etc.) are provided for the separation of equipment and cables required to ensure plant safety. Therefore, the inspection team leader will ensure the **inspector** is knowledgeable regarding reactor plant fire protection systems, features and procedures.
4. **B.5.b Mitigating Strategies. The inspector knowledgeable in this area will work with other team members to identify which alternative mitigating strategies should be reviewed. The inspector will determine if these strategies remain feasible. Therefore, the inspection team leader will ensure that the inspector is knowledgeable regarding B.5.b mitigating strategies.**

b. Regulatory Requirements and Licensing Bases. The regulatory requirements and licensing bases against which post-fire safe shutdown capability is assessed are as follows:

1. Part 10 of the Code of Federal Regulations. 10 CFR 50.48(a), Fire Protection, requires each operating nuclear power plant to have a fire protection plan which satisfies the requirements of Criterion 3 of Appendix A to 10 Part 50. The NRC has identified that an acceptable plan is one that meets the requirements of Appendix R to 10 Part 50, or a plan that satisfies the guidance of standard review plan (SRP) Section 9.5-1.
2. Plants licensed before January 1, 1979. These plants are subject to the requirements of 10 CFR Part 50.48(a) and (b) and Appendix R to 10 CFR Part 50. Appendix R, Sections III.G, III.J, and III.O were backfit on plants licensed before January 1, 1979. Licensees were required to meet the separation requirements of Section III.G.2, the alternative or dedicated shutdown capability requirements of Sections III.G.3 and III.L, or to request an exemption in accordance with 10 CFR Part 50.12. Alternative or dedicated safe shutdown capabilities were required to be submitted to the Office of Nuclear Reactor Regulation (NRR) for review. NRR approvals are documented in SERs.
3. Plants licensed after January 1, 1979. These plants are subject to requirements as specified in the conditions of their facility operating license, in commitments made to the NRC, or in deviations exemptions or licensee amendments granted by the NRC. These requirements are generally similar

to those in 10 CFR Part 50 Appendix R.

4. Changes to the fire protection program. The licensee may make changes to the approved fire protection program without prior approval by the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire. In addition the licensees may be required to retain the fire protection plan and each change to the plan as a record pursuant to paragraph 50.48.
- c. Licensee Notification and Information Gathering.
1. Licensee Notification Letter. The licensee should be notified of the triennial inspection in writing at least three months in advance of the onsite week. The information gathering visit shall be conducted no fewer than three weeks in advance of the onsite inspection week. The letter should discuss the scope of the inspection, request an information-gathering visit to the licensee reactor site/engineering offices, discuss documentation and licensee personnel availability needs during the onsite inspection week, and request a pre-inspection conference call to discuss administrative matters and finalize inspection activity plans and schedules. A template for an NRC to licensee triennial fire protection baseline inspection notification letter is provided as Attachment 1.
  2. Information Gathering Site Visit. The inspection team should conduct a two to three day information gathering site visit. The purposes of the information gathering site visit are to (1) gather site-specific information important to inspection planning, and (2) conduct initial discussions with licensee representatives regarding administrative items and inspection activity plans and schedules. In advance of the information-gathering site visit, the team leader should provide the licensee with a list of information and documents that may be needed for the team to prepare for and conduct the triennial inspection, as well as a list of any planned requests for licensee conducted evolutions (e.g., emergency lighting tests, communication tests, fire drills, shutdown walkthroughs, etc.).

Prior to the inspection information gathering trip, the team leader should contact the regional (SRA) to obtain summary of plant specific fire risk insights (e.g., fire risk ranking of the rooms/plant fire areas, conditional core damage probabilities (CCDPs) for those rooms and areas, and transient sequences for these rooms). After considering the focus and result of past fire protection and post-fire safe shutdown inspections, the team should select three to five fire areas important to risk **and conduct a walkdown of these areas prior to finalizing the sample selection and requesting documentation from the licensee.**

After the information gathering site visit, the team leader should use the SRA developed fire risk insights, as well as technical input from the other team members, to develop an inspection plan addressing (for the selected three to

five fire areas, zones, as applicable) post-fire SSD capability and the fire protection features for maintaining one success path of this capability free of fire damage.

3. Information Required/Preparation. The **inspection** team should gather sufficient information to become familiar with the following during the preparation period:
  - (a) The reactor plant's design, layout, and equipment configuration.
  - (b) The reactor plant's current post-fire safe shutdown licensing basis through review of 10 Part 50.48, 10 CFR Part 50 Appendix R (if applicable), NRC safety evaluation reports (SERs) on fire protection, the plant's operating license, updated final safety analysis report (UFSAR), and approved exemptions or deviations.
  - (c) The licensee's strategy and methodology, and derivative procedures, for accomplishing post-fire safe shutdown conditions. Among the sources of information are the updated final safety analysis report (UFSAR), the latest version of the fire hazards analysis (FHA), the latest version of the post-fire safe shutdown analysis (SSA), fire protection/post-fire safe-shutdown related changes that used 10 Part 50.59, 50.48(a) or other criteria, and Generic Letter 86-10 review documentation and modification packages, plant drawings, emergency/abnormal operating procedures, and the results of licensee internal audits (e.g., self assessments and quality assurance (QA) audits in the fire protection and post-fire safe shutdown areas).
  - (d) The historical record of plant-specific fire protection issues through review of plant-specific documents such as previous NRC inspection results, internal audits performed by the reactor licensee (e.g., self-assessments and quality assurance audits), corrective action system records, event notifications submitted in accordance with 10 CFR Part 50.72, and licensee event reports (LERs) submitted in accordance with 10 CFR 50.73.
  - (e) The safe shutdown systems and support systems credited by the licensee's analysis for each fire area, room, or zone for accomplishing of the required shutdown functions (e.g., reactivity control, reactor coolant makeup, reactor heat removal, and process monitoring and support functions) as necessary to comply with the SSD requirements of 10 CFR Part 50.48(a) and plant-specific licensing requirements. The shutdown logic for each area, room, or zone to be inspected must be thoroughly understood by the team members.
  - (f) The licensee's analytical approach for electrical circuit separation analyses, and the licensee's methodology for identification and resolution of circuits of concern. The team's electrical review should

include addressing the assumptions and boundary conditions used in the performance of the licensee's analyses.

03.02 Fire Protection Inspection Activities. For those fire protection structures, systems, and components installed to satisfy NRC requirements designed to NFPA codes and standards, the code edition in force at the time of the design and installation is the code of record to which the design is evaluated.

Deviations from the codes should be identified and justified in the UFSAR or FHA. A licensee may apply the equivalency concept in meeting the provisions of the NFPA codes and standards. When the licensee states that its design "meets the NFPA code(s)" or "meets the intent of the NFPA code(s)" and does not identify any deviations from such codes, the NRC expects that the design conforms to the codes and the design is subject to inspection against the NFPA codes. The "Authority Having Jurisdiction" as described in NFPA documents refers to the Director, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, or designee.

If the inspectors determine that the operator manual actions are not reasonably accomplishable and therefore implementation may not lead to a safe plant condition, the preliminary finding will be identified and entered into the Significance Determination Process (SDP), Inspection Manual Chapter IMC0609 Appendix F.

03.03 B.5.b Inspection Activities.

- a. NEI 06-12, "B.5.b Phase 2 & 3 Submittal Guideline," the licensee's submittals, the NRC's SER, and the conforming license conditions (codified as 10 CFR 50.54(hh)(2)), available on the B.5.b Inspection Community of Practice website provide the bases and acceptance guidelines for B.5.b related equipment and mitigating strategies. Previous inspection reports should be referenced for commitments made by licensees to correct deficiencies identified during previous performance of this inspection or performance of TI 2515/171.
- b. It is expected that most of the material that will be reviewed as part of this inspection effort will be sensitive unclassified non-safeguards information (SUNSI). However, based on the scope of the inspection, it is not expected that any SUNSI material will need to be documented in the inspection report, and inspectors should preclude withholding information from public inspection reports to the maximum extent practical. In the event that an inspection does require documentation of such information, guidance on how it should be accomplished is provided in IMC 0612. Additional guidance regarding SUNSI is available on the NRC internal website (<http://www.internal.nrc.gov/sunsi>).

03.04 Identification and Resolution of Problems. No specific guidance is provided.

71111.05-04 RESOURCE ESTIMATE

The resource to perform this inspection procedure is estimated to be 218 hours every 3

years for the triennial inspection regardless of the number of reactor units at the site.

#### 71111.05-05 PROCEDURE COMPLETION

Inspection of the minimum sample size will constitute completion of this procedure in the Reactor Programs System (RPS).

The minimum sample size for fire protection inspection activities is defined as 3 samples (inspection of three fire areas) regardless of the number of reactor units at that site.

The minimum sample size for B.5.b inspection activities is defined as 1 sample regardless of the number of reactor units at that site.

#### 71111.05-06 REFERENCES

NOTE: Some references contain hyperlinks to the specific document. These hyperlinks should be used with caution (the linked document should be verified to be the current version prior to use).

Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process"

Inspection Procedure 71152, "Identification and Resolution of Problems"

[Information Notice 97-48](#), "Inadequate or Inappropriate Interim Fire Protection Compensatory Measures"

Individual Plant Examination of Externally Initiated Events (IPEEE)

[Regulatory Guide 1.189](#), "Fire Protection for Nuclear Power Plants"

[Regulatory Issue Summary 2004-03](#), Rev 1, "Risk-Informed Approach for Post-Fire Safe-Shutdown Circuit Inspections"

[Regulatory Issue Summary 2005-07](#), "Compensatory Measures to Satisfy the Fire Protection Program Requirements"

[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'"

[Regulatory Issue Summary 2005-30](#), "Clarification of Post-Fire Safe-Shutdown Circuit Regulatory Requirements"

Temporary Instruction 2515/171, "Verification of Site Specific Implementation of B.5.b Phase 2 & 3 Mitigating Strategies"



NEI 99-04, "Guidelines for Managing NRC Commitments" (ML003680088)

NRR Office Instruction 105, "Managing Regulatory Commitments Made by Licensees to the NRC"

NEI 06-12, Rev 2, "B.5.b Phase 2 & 3 Submittal Guideline"

B.5.b Inspection Community of Practice

WCAP 16800-NP, Revision 0, "Insights for Operating Steam Generators to Minimize RCS Inventory Loss Following a Loss of All AC and DC Power" (ML091410184)

## ATTACHMENT 1

Mr. President  
Licensee Nuclear Department  
Licensee Corporation or Company  
Address

SUBJECT: SELECTED NUCLEAR POWER STATION, UNITS 1 AND 2 - NOTIFICATION  
OF CONDUCT OF A TRIENNIAL FIRE PROTECTION BASELINE  
INSPECTION

Dear Mr. :

The purpose of this letter is to notify you that the U.S. Nuclear Regulatory Commission (NRC) Region # staff will conduct a triennial fire protection baseline inspection at Selected Nuclear Power Station, Units 1 and 2 in Month, 20##. The inspection team will be lead by First Last, a fire protection specialist from the NRC Region # Office. The team will be composed of personnel from NRC Region #, and Contracted National Laboratory. The inspection will be conducted in accordance with IP 71111.05, the NRC's baseline fire protection inspection procedure.

The schedule for the inspection is as follows:

- Information gathering visit - Dates [Note - this date is pre-coordinated with the licensee]
- Week of onsite inspection - Dates.

The purposes of the information gathering visit are to obtain information and documentation needed to support the inspection, to become familiar with the Selected Nuclear Power Station, Units 1 and 2 fire protection programs, fire protection features, post-fire safe shutdown capabilities and plant layout, **mitigating strategies to address Section B.5.b of the Interim Compensatory Measures Order, EA-02-026, of February 25, 2002/10 CFR 50.54(hh)(2)**; and, as necessary, obtain plant specific site access training and badging for unescorted site access. A list of the types of documents the team may be interested in reviewing, and possibly obtaining, are listed in Enclosures **1 and 2**.

During the information gathering visit, the team will also discuss the following inspection support administrative details: office space size and location; specific documents requested to be made available to the team in their office spaces; arrangements for reactor site access (including radiation protection training, security, safety and fitness for duty requirements); and the availability of knowledgeable plant engineering and licensing organization personnel to serve as points of contact during the inspection.

We request that during the onsite inspection week you ensure that copies of analyses, evaluations or documentation regarding the implementation and maintenance of the Selected Nuclear Generating Station, Units 1 and 2 fire protection program, including post-

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Att1-1

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fire safe shutdown capability, be readily accessible to the team for their review. Of specific interest for the fire protection portion of the inspection are those documents which establish that your fire protection program satisfies NRC regulatory requirements and conforms to applicable NRC and industry fire protection guidance. For the B.5.b portion of the inspection, those documents implementing your mitigating strategies and demonstrating the management of your commitments for the strategies are of specific interest. Also, personnel should be available at the site during the inspection who are knowledgeable regarding those plant systems required to achieve and maintain safe shutdown conditions from inside and outside the control room (including the electrical aspects of the relevant post-fire safe shutdown analyses), reactor plant fire protection systems and features, and the Selected Nuclear Power Station fire protection program and its implementation.

This letter does not contain new or amended information collection requirements subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing information collection requirements were approved by the Office of Management and Budget, control number 3150-0011. The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid Office of Management and Budget control number.

Your cooperation and support during this inspection will be appreciated. If you have questions concerning this inspection, or the inspection team's information or logistical needs, please contact First Last, the team leader, in the Region # Office at ###-###-####.

Sincerely,

Docket Nos.: 50-###  
and 50-###

Enclosure: As stated (1)

## ENCLOSURE 1

### Reactor Fire Protection Program Supporting Documentation

[Note: This is a broad list of the documents the NRC inspection team may be interested in reviewing, and possibly obtaining, during the information gathering site visit.]

1. The current version of the Fire Protection Program and Fire Hazards Analysis.
2. Current versions of the fire protection program implementing procedures (e.g., administrative controls, surveillance testing, fire brigade).
3. Fire brigade training program and pre-fire plans.
4. Post-fire safe shutdown systems and separation analysis.
5. Post-fire alternative shutdown analysis.
6. Piping and instrumentation (flow) diagrams showing the components used to achieve and maintain hot standby and cold shutdown for fires outside the control room and those components used for those areas requiring alternative shutdown capability.
7. Plant layout and equipment drawings which identify the physical plant locations of hot standby and cold shutdown equipment.
8. Plant layout drawings which identify plant fire area delineation, areas protected by automatic fire suppression and detection, and the locations of fire protection equipment.
9. Plant layout drawings which identify the general location of the post-fire emergency lighting units.
10. Plant operating procedures which would be used and describe shutdown from inside the control room with a postulated fire occurring in any plant area outside the control room, procedures which would be used to implement alternative shutdown capability in the event of a fire in either the control or cable spreading room.
11. Maintenance and surveillance testing procedures for alternative shutdown capability and fire barriers, detectors, pumps and suppression systems.
12. Maintenance procedures which routinely verify fuse breaker coordination in accordance with the post-fire safe shutdown coordination analysis.

13. A sample of significant fire protection and post-fire safe shutdown related design change packages and Generic Letter 86-10 evaluations.
14. The reactor plant's IPEEE, results of any post-IPEEE reviews, and listings of actions taken/plant modifications conducted in response to IPEEE information.
15. Temporary modification procedures.
16. Organization charts of site personnel down to the level of fire protection staff personnel.
17. If applicable, layout/arrangement drawings of potential reactor coolant/recirculation pump lube oil system leakage points and associated lube oil collection systems.
18. A listing of the SERs which form the licensing basis for the reactor plant's post-fire safe shutdown configuration.
19. Procedures/instructions that control the configuration of the reactor plant's fire protection program, features, and post-fire safe shutdown methodology and system design.
20. A list of applicable codes and standards related to the design of plant fire protection features and evaluations of code deviations.
21. Procedures/instructions that govern the implementation of plant modifications, maintenance, and special operations, and their impact on fire protection.
22. The three most recent fire protection QA audits and/or fire protection self-assessments.
23. Recent QA surveillances of fire protection activities.
24. A listing of open and closed fire protection condition reports (problem reports/NCRs/EARs/problem identification and resolution reports).
25. Listing of plant fire protection licensing basis documents.
26. A listing of the NFPA code versions committed to (NFPA codes of record).
28. A listing of plant deviations from code commitments.
29. Actual copies of Generic Letter 86-10 evaluations.

## ENCLOSURE 2

### Mitigating Strategies Supporting Documentation

[Note: This is a broad list of the documents the NRC inspection team may be interested in reviewing, and possibly obtaining, during the information gathering site visit.]

1. A list of all modifications to regulatory commitments made to meet the requirements of Section B.5.b of the ICM Order, EA-02-026, dated February 25, 2002, the subsequently imposed license conditions, and 10 CFR 50.54(hh)(2).
2. Copies of procedures/guidelines that were revised or generated to implement the mitigation strategies. These could be extensive damage mitigation guidelines (EDMGs), severe accident management guidelines (SAMGs), emergency operating procedures (EOPs), abnormal operating procedures (AOPs), etc.
3. A matrix that shows the correlation between the mitigation strategies identified in Nuclear Energy Institute 06-12 and the site-specific procedures or guidelines that are used to implement each strategy.
4. Engineering evaluations/calculations that were used to verify engineering bases for the mitigation strategies.
5. Piping and instrumentation diagram (P&ID) or simplified flow diagrams for systems relied upon in the mitigation strategies. These could be the type used for training.
6. A modification package or simplified drawings/descriptions of modifications that were made to plant systems to implement the mitigation strategies.
7. Copies of procedures used to inventory equipment (hoses, fittings, pumps, etc.) required to be used to implement the mitigation strategies.
8. A list of B.5.b strategies, if any, which have implementing details that differ from that documented in the submittals and the safety evaluation report.
9. A copy of site general arrangement drawing(s) that show the majority of buildings/areas referenced in B.5.b documents.
10. Training records/ training matrix/ lesson plans related to B.5.b.
11. Copies of Memoranda of Understanding (MOUs) (e.g., with local fire departments) required to implement any mitigating strategies.

END

ATTACHMENT 2

Revision History For  
Inspection Procedure IP 71111.05T

Commitment Tracking Number	Issue Date	Description of Change	Training Needed	Training Completion Date	Comment Resolution Accession Number
N/A	04/21/06	Previous History Review	N/A	N/A	N/A
N/A	03/06/03 CN 03-007	Provide inspection guidance to evaluate licensee manual actions which have been incorporated into the procedure as Enclosure	No	N/A	NA
N/A	12/01/04 CN 04-027	This revised triennial fire protection inspection procedure includes inspection guidance for identifying circuits that could prevent the plant from achieving and maintaining hot shutdown condition after a fire. Inspection of these circuits was suspended in 2000, pending the conduct of fire tests and the assessment of the results in order to gain risk insights into the phenomena of fire-induced electrical cable failures. The inspection guidance is designed to help the inspectors identify categories of circuit configurations most likely to be impacted by fire potentially affecting the capability of the operators to bring the plant to a safe shutdown condition.	Yes	11/04	NA

N/A	04/21/06	This revision reflects the withdrawal of the Manual Action rule. Manual actions will not be acceptable as alternatives to the existing requirements of 10 CFR Part 50.48(b) unless the licensee submits an exemption/deviation request. However, the use of manual actions will continue to be acceptable as compensatory measures. To that effect this procedure continues to provide guidance to the inspectors to assess the viability of manual actions as compensatory measures.	No	NA	NA
NA	12/24/09 CN 09-032	This revision incorporates the B.5.b inspection attributes (previously inspected via TI 2515/171) to this procedure so that the inspection will be performed by specifically trained DRS staff on a triennial basis consistent with the relative risk and safety significance of this issue. Additional resource estimate for revised procedure is 18 hours (triennially) based on experience with the B.5.b TIs. This revision also includes incorporation of ROP Feedback Form 1344 (inspector knowledge requirements), 1345 (duplication of guidance) and 1383 (staffing and scope of information gathering trip). The format has also been revised to meet the requirements of IMC 0040.	No	NA	ML093410056