

NRC INSPECTION MANUAL

IRIB

INSPECTION PROCEDURE 71111 ATTACHMENT 21N.05

FIRE PROTECTION TEAM INSPECTION (FPTI)

Effective Date: 01/01/2020

PROGRAM APPLICABILITY: IMC 2515 A

CORNERSTONE: Initiating Events (20 percent)
 Mitigating Systems (80 percent)

INSPECTION BASES: See Inspection Manual Chapter (IMC) 0308, Attachment 2

SAMPLE REQUIREMENTS:

Sample Requirements		Minimum Baseline Sample Completion Requirements		Budgeted Range	
Sample Type	Section	Frequency	Sample Size (per site)*	Samples (per site)	Hours per Site every four years
Structures, Systems and Components (SSCs) Credited for Fire Prevention, Detection, Suppression, or Post-Fire SSD	03.01	Triennial	3**	3-4	210+/-21
Fire Protection Program (FPP) Administrative Controls	03.02		1	1-2	
FPP Changes	03.03		1	1-2	

* A minimum of one sample in each of the "Sample Type" categories

** Select a minimum of 1 SSC credited for fire prevention, detection, suppression, and a minimum of 1 SSC credited for post-fire SSD.

71111.21N.05-01 INSPECTION OBJECTIVES

01.01 To verify that plant SSCs credited in the approved Fire Protection Program (FPP) can perform their licensing basis function.

01.02 To conduct reviews of aging management, self-approved changes to FPP, operating experience, plant modifications, procedural changes, and risk insights for the selected samples to verify they are maintained within their current licensing basis.

01.03 To assess the control of interdisciplinary interfaces and coordination among participating organizations necessary to maintain the approved FPP.

71111.21N.05-02 GENERAL GUIDANCE

The team leader should contact the licensee and/or the regional Senior Reactor Analyst (SRA) to obtain a summary of plant-specific fire risk insights (e.g., fire risk ranking of plant Fire Areas (FAs)/Fire Zones (FZs), conditional core damage probabilities for fire scenarios in those areas, and transient sequences for these rooms). The inspection team should also solicit input from the resident inspectors and regional inspectors for possible components and modifications for inspection. The team leader may make a site visit/information gathering trip, as needed, to aid in selection of inspection samples.

Select a total of 5 to 8 samples of SSCs, FPP changes/modifications, and FPP administrative controls, as specified in the Sample Requirements table above:

- SSCs Credited for Fire Prevention, Detection, or Suppression. Focus on SSCs that are specifically credited to meet regulatory requirements within the FPP. Also, consider SSCs that have previously approved exemptions associated with them, or FAs/FZs that have engineering evaluations that require specific FP SSCs. Review of programs and administrative controls may include the station's combustible control program, NFPA 805 monitoring program, fire system impairments, fire brigade drills and training, etc. (Inspection Procedure 71111 Attachment 05, Fire Protection [ML18085A040](#) covers fire brigade drills and training).
- SSCs Credited for Post-Fire SSD. Focus on SSCs that are needed to place a plant in a safe and stable shutdown condition. Consult with the regional SRA to determine the risk significance of the systems credited for SSD following a fire.
- FPP changes. Focus on FPP changes since the last performance of this FPTI. Samples in this area may include temporary modifications, repairs, permanent plant changes, design changes, procedure changes, aging management changes, equivalency evaluations, suitability analyses, calculations, and commercial grade dedications which can introduce changes to the FPP and/or fire safe shutdown capability.
- FPP Administrative Controls. Focus on processes that are credited for administrative control of the fire protection program (i.e., combustible control program, hot work program, monitoring program).

Select a minimum of 1 SSC credited for fire prevention, detection, suppression, and a minimum of 1 SSC credited for post-fire SSD.

Samples do not need to be limited to a certain FA or FZ. In special circumstances (e.g., based on operating experience), the team lead may select an entire FA or FZ as one sample, to perform a more thorough review of credited fire protection (FP) features in that area, as well as credited post-fire SSD capability for a fire in that area.

For each sample, conduct a routine review of problem identification and resolution activities using IP 71152, "Problem Identification and Resolution," that should include a review of selected corrective action documents issued since the last FPTI, including those resulting from events and degraded/deficient conditions.

71111.21N.05-03 INSPECTION SAMPLES

03.01 SSC Credited for Fire Prevention, Detection, Suppression, or Post-Fire SSD Review

Verify that components and/or systems will function as required to support the credited functions stated for each sample. Additional inspection considerations are located in the fire hazards analysis (FHA) or safe shutdown analysis (SSA).

- a. **Review deficiencies or open fire protection impairments for the selected system, including any temporary modifications, operator workarounds, or compensatory measures.**
- b. **Verify that operator actions can be accomplished as assumed in the licensee's FHA, or as assumed in the licensee's fire probabilistic risk assessment (FPRA) analysis and SSA.**
- c. **Review repetitive or similar maintenance work requests which could be an indicator of a design deficiency and could affect the ability of the components to perform their functions, when needed.**
- d. **Ensure that post maintenance and/or surveillance activities are performed as scheduled.**
- e. **Perform a walkdown inspection to identify equipment alignment discrepancies. Inspect for deficient conditions such as corrosion, missing fasteners, cracks, and degraded insulation.**
- f. **Ensure the selected SSCs that are subject to aging management review (AMR) pursuant to 10 CFR Part 54 are being managed for aging (e.g., loss of material, cracking, reduction of heat transfer) in accordance with appropriate aging management programs. Verify that the licensee's aging management program activities (such as, Fuel Oil Analysis or Selective Leaching Aging Management Program) associated with FP equipment are being implemented.**
- g. **If a review of operating experience issues will be completed for the selected inspection sample, verify that the licensee adequately reviewed and dispositioned the operating experience in accordance with their processes.**

Specific Guidance

Active FP systems. Verify that detection and automatic and manual suppression systems are installed, tested, and maintained in accordance with the NFPA codes of record and plant specific commitments for the FA/FZ in which the SSC is located. Verify that the design capability of suppression agent delivery systems (i.e., water supply) meet the requirements of the approved FPP. Verify that any Very Early Warning Fire Detection System (VEWFDS) system sensitivity settings are consistent with any code requirements or regulatory commitments. Sometimes VEWFDS does not provide equal sensitivity at every hole, therefore, the minimum sensitivity should be verified.

Passive FP systems. Verify through review of installation or repair records that material of an appropriate FP rating (equal to the overall rating of the barrier itself) has been used to fill openings and fire barrier penetration seals and that the installation meets engineering design. Verify through review of installation or repair records that material of an appropriate FP rating has been used as FP wraps, that the installation meets engineering design and standard industry practices, and that it was either properly evaluated or qualified by appropriate fire endurance tests. Verify that an evaluation has been performed using appropriate fire test data for unusual installation configurations and/or application of unusual materials.

- Post-fire SSD SSCs. Verify that proper separation or protection of circuits and circuit coordination have been provided by sampling at least one FA/FZ. Otherwise, ensure appropriate operator manual actions/recovery actions have been established.
- Review deficiencies or open FP impairments for the selected system, including any temporary modifications, operator workarounds, or compensatory measures. Verify that appropriate actions have been taken by the licensee for out-of-service, degraded, or inoperable/nonfunctional FPP-credited equipment, systems, or features. Ensure that the actions implemented meet the FPP system functionality requirements, or that the licensee has performed a FPP change evaluation to support implementation of a compensatory measure that deviates from program requirements. Short term compensatory measures should compensate for the degraded function or feature by enhancing one or more defense-in-depth elements 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). For plants that have transitioned to NFPA 805, the licensee is required to establish a monitoring program that ensures that the availability and reliability of the FP systems and features credited in the performance-based analyses.
- Verify that operator actions can be accomplished as assumed in the licensee's Fire Hazards Analysis (FHA), fire probabilistic risk assessment (FPRA), and safe shutdown analysis (SSA). For plants that have transitioned to National Fire Protection Association (NFPA) 805, the SSA is often referred to as the Nuclear Safety Capability Assessment (NSCA).
 1. Active FP systems. Verify that any actions required by operators or the fire brigade to actuate the system are feasible and reliable and can be performed within acceptable timelines to support assumptions in the FHA and the FPRA.

2. Post-fire SSD SSCs. Review the post-fire SSD procedure for the selected FAs/FZs to verify that steps taken by operators are adequate to ensure the operability/functionality of the SSC to support SSD. If the licensee's SSA for the selected areas credits operator manual actions (OMAs) or recovery actions (RAs), consider conducting a walk down of the applicable steps of the procedure to verify the adequacy of the credited OMA/RAs. The intent of this inspection requirement is to support verification of engineering inputs and assumptions. Resources permitting, the team may verify other aspects of the OMA/RAs such as whether any special equipment is required to perform these procedures and if the equipment is available, accessible, properly staged, and in good working order. Additionally, the team may choose to verify that the knowledge level of the operators is adequate concerning equipment location and operation.
- The FP licensing and design basis under license renewal should not differ from what was in effect before license renewal, with the exception that FP SSCs must be included in an aging management program as appropriate. Examples of fire protection components that are passive and long-lived and, therefore, subject to an aging management review (AMR), include fire barrier assemblies (e.g., walls, ceilings, floors, damper housings, doors, and penetration seals), sprinklers, nozzles, fire suppression system piping and valve casings, fire protection tanks and pump casings, and fire hydrant casings. Active components as described in 10 CFR 54.4, "Scope", are components that perform an intended function with moving parts or with a change in configuration or properties; and as such, they are excluded from an AMR. For example, smoke/heat detectors and fire extinguishers are considered active components. Indications of aging should be evaluated to determine if changes to the aging management program are required to ensure degradation is identified prior to loss of intended function.

03.02 Fire Protection Program Administrative Controls.

Verify that the selected control or process is implemented in accordance with the licensee's current licensing basis. If applicable, ensure that the licensee's FPP contains adequate procedures to implement the selected administrative control. Verify that the selected administrative control meets the requirements of all committed industry standards.

Specific Guidance

None

03.03 Fire Protection Program Changes/Modifications

Verify the following:

- a. **Changes to the approved FPP do not constitute an adverse effect on the ability to safely shutdown.**
- b. **The adequacy of the design modification, if applicable.**

- c. **Assumptions and performance capability stated in the SSA have not been degraded through changes or modifications.**
- d. **The FPP documents, such as the Updated Final Safety Analysis Report, fire protection report, FHA, and SSA were updated consistent with the FPP or design change.**
- e. **Post-fire SSD operating procedures, such as abnormal operating procedures, affected by the modification were updated.**

Specific Guidance

If the licensee has adopted the standard FP license condition, then the licensee may make changes to the approved FPP 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. Within the context of the standard FP license condition, the phrase “not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire,” means to maintain sufficient safety margins. Reference Regulatory Guide 1.189 for more information on changes to the FPP.

For plants that have transitioned to NFPA 805, licensees must evaluate changes to the FPP, or changes to the plant that might impact the FPP, by using a plant change evaluation process that meets the requirements of NFPA 805, Sections 2.2.9 and 2.4.4. Regulatory Guide 1.205 and NEI 04-02, Revision 2 provide guidelines for implementing the process and the basis for determining if the changes can be licensee approved or will require approval by the NRC.

Modifications to safety-related SSCs could affect FP systems. Verify that the design basis, licensing basis, performance capability of FP systems, and assumptions as stated in the SSA have not been degraded through changes or modifications to the plant. Refer to 71111.18, “Plant Modifications” for more specific guidance related to inspecting plant modifications.

71111.21N.05-04 REFERENCES

Cross Reference of Generic Communications to IP 71111.05 and Inspection Resources:
<https://drupal.nrc.gov/nrr/ope/33988> (non-public)

Operating Experience Gateway:
<http://drupal.nrc.gov/nrr/ope> (non-public)

IHS Codes and Standards:
<http://www.internal.nrc.gov/TICS/library/standards/ih.html> (non-public)

U.S. Nuclear Regulatory Commission Technical Library:
<http://www.internal.nrc.gov/TICS/library/index.html> (non-public)

END

Attachment 1
Revision History for IP 71111.21N.05

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public Information)
N/A	ML19084A040 06/12/19 CN 19-019	<p>First issuance. Completed 4-year search for commitments and found none. This procedure replaces IPs 71111.05T and 71111.05XT. The following FBFs associated with those two IPs were closed:</p> <ol style="list-style-type: none"> 1. The recommendation to rename B.5.b equipment will not be incorporated since this equipment will not be inspected by this FEI. 2. Performance-based aging management inspection guidance has been incorporated in Section 03.01 f. 3. A statement in the corrective action portion to require inspectors to review the past corrective action documents that resulted from the last FEI has been incorporated into 7111.21N.05.02, "GENERAL GUIDANCE". 4. A review of the licensee's combustible control program has been included in Section 71111.21N.05-02, "GENERAL GUIDANCE". 	None	<p>ML19084A044</p> <ol style="list-style-type: none"> 1. Closed FBF: 71111.05T-1947 ML19051A020 2. Closed FBF: 71111.05T-2056 ML19051A021 3. Closed FBF: 71111.05T-2292 ML19051A022 4. Closed FBF: 71111.05XT-2216 ML19051A023 5. Closed FBF: 71111.05XT-2293 ML19051A024 6. Closed FBF: 71111.05XT-2334 ML19051A025 7. Closed FBF: 71111.05XT-2341 ML19051A026

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public Information)
		<p>5. A statement in the corrective action portion to require inspectors to review the past corrective action documents that resulted from the last FEI has been incorporated into 7111.21N.05.02, "GENERAL GUIDANCE".</p> <p>6. A review of the licensee's combustible control program has been included in Section 71111.21N.05-02, "GENERAL GUIDANCE" section.</p> <p>7. The recommendation to request any documents to support inspector preparation or evaluation of the Fire Protection System Monitoring Program will not be incorporated since the FEI will not include guidance to request fire protection-related documents.</p>		