INSPECTION PROCEDURE 64704

DECOMMISSIONING FIRE PROTECTION PROGRAM

Effective Date: 07/01/2025

PROGRAM APPLICABILITY: IMC 2561 A

64704-01 INSPECTION OBJECTIVES

01.01 To assess whether the licensee has an effective decommissioning fire protection program that is maintained and implemented to address the potential for fires that could result in the release or spread of radioactive materials. [Title 10 of the *Code of Federal Regulations* (10 CFR) 50.48(f)]

01.02 To verify the decommissioning fire protection program protects the integrity of the spent fuel and prevents and minimizes the release of radioactive materials resulting from fires involving contaminated plant structures, systems, and components (SSCs) or radioactive waste products.

64704-02 GENERAL GUIDANCE

10 CFR 50.48(f) requires licensees that have certified the permanent cessation of operations and the removal of the fuel from the reactor vessel under 10 CFR 50.82(a)(1) to maintain a fire protection program to address the potential for fires that could cause the release or spread of radioactive materials (i.e., result in a radiological hazard). A fire protection program that complies with 10 CFR 50.48(c) incorporates by reference, with exceptions, modifications, and supplementation, National Fire Protection Association (NFPA) Standard 805, “Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants” is deemed to be acceptable for complying with the requirements of 10 CFR 50.48(f). Additional guidance associated with 10 CFR 50.48 can be found in IP 71111.05, “Fire Protection.”

Regulatory Guide 1.191, Revision 1, “Fire Protection Program for Nuclear Power Plants During Decommissioning,” provides methods that are acceptable to the NRC staff for complying with the NRC’s regulations for fire protection programs for licensees that have certified that their plants have permanently ceased operations and that the fuel has been removed from the reactor vessels. The inspector should use this guidance when reviewing a licensee’s fire protection program. For a plant that has implemented NFPA 805 fire protection program, the inspector should refer to Section C.6, of Regulatory Guide 1.191, Revision 1, for additional guidance when inspecting certain aspects of the plant’s fire protection program.

Due to the various stages of decommissioning, the inspector should perform the applicable requirements of this IP per the stage of decommissioning the site is currently in. The inspector should obtain and review the licensee’s pre-fire plans, defueled fire hazard analysis, and associated procedures prior to arrival onsite to determine which requirements to inspect. The inspector should also review previous NRC inspection reports to ascertain the scope of previous reviews and documented licensee performance.

Decommissioning activities may increase fire hazards in the plant through mechanisms that include, but are not limited to, increased hot work, increased combustible loading, erection of temporary structures to support decommissioning or dismantlement of the plant, and deactivation or abandonment of plant systems. In addition to the physical changes to the plant, the licensee's organizational structure and responsibilities are expected to be different during decommissioning, with staffing levels significantly lower than during plant operation. Inspectors should select inspection items using a risk-informed, performance-based approach, while also considering variety.

When a site is in SAFSTOR (i.e., long-term safe storage), the inspector should focus on changes to the fire protection program, compliance with their existing program, including any coordination with local offsite responders, and observations during walkdowns of the plant to include combustible materials and ignition sources, and the physical condition of fire detection and fire suppression systems.

Inspectors should consider the following when evaluating the safety significance of actual or potential fires. For actual fires: 1) any spread of contamination; 2) any occupational exposure impacts such as contamination or internal dose; 3) the location of the fire; 4) whether a minor alteration of circumstances (as they actually happened) could have resulted in greater consequences. In general, fires that occurred in the radiologically controlled area should be considered of more than minor safety significance. For potential fires: 1) amount and distance of transient combustibles from hot work; and 2) the impact should a fire have occurred, including the location of the hot work and surrounding SSCs, i.e., those that support safe storage of spent nuclear fuel.

64704-03 INSPECTION REQUIREMENTS AND GUIDANCE

03.01 Fire Protection Program

Verify that the licensee is adequately implementing the administrative portions of their fire protection program using a risk-informed approach.

Specific Guidance

As decommissioning progresses and the spent fuel is moved to an Independent Spent Fuel Storage Installation or permanent repository, the fire protection requirements for the plant will be scaled down in accordance with the diminishing radiological hazard. However, even in the absence of spent fuel in the spent fuel storage pool, a fire protection program that ensures adequate protection from the fire-induced release of radioactive material from contaminated plant areas and combustible waste products should be maintained.

The operating plant fire protection program provides the baseline analysis and description of plant fire hazards, administrative controls, physical protection features, and emergency response capabilities. Many of these elements are carried over to the fire protection program for a decommissioning reactor. The fire protection program is expected to change throughout the various phases of decommissioning. Initially, with spent fuel removed from the reactor vessel and stored in the spent fuel storage pool, it is appropriate to develop and maintain a comprehensive decommissioning fire protection program to ensure that the probability of fires affecting the spent fuel or other

radiological hazards is minimized and that the consequences of fires, should they occur, are adequately mitigated.

The defueled fire hazards analysis should be reevaluated and revised by the licensee as necessary to reflect the unique or different fire protection issues and strategies associated with decommissioning. The inspector should assess the licensee's fire protection program is reevaluated and revised as necessary to reflect the facility condition through the various stages of decommissioning. [10 CFR 50.48(f)(2)]

The licensee may make changes to the fire protection program without prior NRC approval provided the changes do not reduce the effectiveness of fire protection for facilities, systems, and equipment that could result in a radiological hazard, taking into account the decommissioning plant conditions and activities. The inspector should review the changes to the fire protection program to determine the changes do not reduce the effectiveness of the fire protection program. [10 CFR 50.48(f)(3)]

03.02 Fire Area Walkdown and Work Observations

a. Verify the adequate implementation of the fire protection program by conducting plant walkdowns of select fire areas and verify that controls are in place for the use and storage of combustible materials in a manner that minimizes the occurrence of fires.

Specific Guidance

The defueled fire hazards analysis provides a comprehensive evaluation of the facility's fire hazards, the fire protection capability relative to the identified hazards, and the ability to protect spent fuel and other radioactive materials from potential fire-induced releases. Fire hazards are typically identified by fire area. The inspector should use the pre-fire plans, when completing walkdowns of the plant, and verify the physical plant layout, configuration, and condition of the fire areas are as described in the fire hazard analysis.

The inspector should complete a plant tour and determine whether combustibles are located near hot work locations, ignition sources, active cables, and electrical equipment, such as cabinets, switchgears, motor control centers, and transformers. Combustible materials, including flammable and combustible liquids, compressed gases, cables, construction materials, and refuse, should be used, stored, and disposed of in a manner that minimizes the occurrence of fire. Transient fire hazards associated with decommissioning activities should be minimized to the extent possible, and the hazards should be removed promptly upon completion of the activities. The inspector should evaluate whether the licensee is controlling and storing transient combustible materials in accordance with their administrative procedures. Determine whether the licensee has stored transient combustibles (e.g., aerosols or combustible/flammable liquids) in approved containers and in such quantities as defined by plant procedure.

The inspector should determine whether good housekeeping practices are being maintained, with particular attention to areas containing radioactive materials or contaminated waste radioactive products and equipment. General housekeeping practices should be implemented to remove trash and clutter, minimize combustibles, and ensure clear access to egress routes throughout the plant.

b. Verify that hot work activities (welding, cutting, grinding, brazing, or similar flame or spark-producing operations) are controlled by licensee procedures and requirements for a fire watch have been established and implemented.

Specific Guidance

The inspector should assess whether the licensee is performing hot work (e.g., cutting, welding, and grinding) in accordance with its fire protection program procedures. Dedicated fire watch personnel for hot work operations should be informed of their specific duties and responsibilities in accordance with licensee procedures. The dedicated fire watch should not be engaged in any other activities and should remain posted for at least 30 minutes (possibly 60 minutes based on licensee commitments) after hot work is complete. The inspector should ensure that the fire watch personnel are trained in the use of fire extinguishers. The inspector should determine whether transient combustibles are within the procedurally specified distance of the work (typically 35 feet). Look in all directions, including above and below the work particularly through grating or other openings.

c. Verify training of the site fire brigade personnel and local offsite fire departments responders, as required, are consistent with the site fire protection program and emergency preparedness requirements.

Specific Guidance

The decommissioning fire protection program should identify and clearly establish the organizational responsibilities for its management and proper implementation. The fire protection responsibilities of licensee contractors should also be established.

The inspector should review the licensee's training program to ensure that the licensee's employees, contractors, and emergency responders have the necessary knowledge and skills to properly execute their responsibilities in the fire protection program. Plant personnel and contractors should be informed of the proper procedures for reporting a fire, responding to fire alarms, preventing fires, locating and using fire extinguishers, and of the hazards of incipient-stage firefighting. Plant personnel who are assigned manual firefighting responsibilities (use of a fire extinguisher and potentially hoses) should receive training commensurate with their responsibilities. Fire brigade members and responding offsite emergency services personnel should receive training on facility layout, fire hazards, pre-fire plans, firefighting equipment, radiation hazards, and health physics relevant to firefighting operations. If local offsite fire departments are utilized as primary or supporting responders, assess the quality of site-specific training provided regarding radiological hazards and plant configuration.

The plant fire brigade drill schedule should allow for periodic local fire department participation. These drills should effectively exercise the fire event command structure between the plant fire brigade and local offsite responders. The inspector should determine whether the licensee is conducting periodic fire drills to determine the readiness and capability of fire brigade personnel and local offsite responders. The plant training program should be described in writing, and the inspector should review written records of plant fire brigade training.

The inspector should determine whether the licensee has established written mutual aid agreements between the utility and the offsite fire departments that are credited in the

fire protection program and listed in the permanently defueled emergency plan. If offsite responders are utilized, the inspector should determine whether the licensee offers periodic training to offsite responders and periodically invites offsite responders to participate in an onsite drill. The inspector should determine whether the process for offsite responder access to onsite areas to determine whether their response will not be delayed. Offsite fire department response should be tested periodically, in conjunction with the required exercises of the radiological emergency response plan required by 10 CFR 50.47, “Emergency plans.” The inspector should determine whether the fire brigade leader has ready access to keys for any locked doors.

03.03 Verification of the Fire Protection Systems and Equipment

Verify the physical fire protection features are effectively maintained, surveillances are performed, and the fire protection features are capable of performing their intended function using a risk-informed approach.

Specific Guidance

The purpose of this inspection requirement is to determine whether the licensee has the ability to rapidly detect, control, and extinguish those fires that do occur and that should result in a radiological hazard. Inspectors should sample from the below guidance based on topical areas until the licensee removes systems and equipment from the site’s fire protection program. The below guidance is grouped by topical area for convenience, not all are required to be reviewed annually. Guidance below each topical area includes examples of items to review within that topical area. Topical areas include fire detection systems, fire suppression systems, fire water supply, fire barriers, and fire protection equipment.

After an incipient fire brigade is established, the inspector should consider the following in determining the scope of their inspection to fulfill this requirement: 1) whether spent nuclear fuel is in wet storage in the spent fuel pool; 2) whether the below fire protection features are still in service; 3) changes to the fire protection program since the last inspection; and 4) recent fire protection related violations.

a. Fire Detection Systems

During decommissioning, the fire hazards and the associated fire detection and alarm requirements will change significantly. The change in priorities from protecting safety-related equipment required for safe shutdown to protecting against the release or spread of radioactive material may require reevaluation of the fire detection and alarm system design to ensure that the fire hazards of decommissioning are adequately addressed.

Fire alarm and supervisory signals should be annunciated in a constantly attended location. The fire alarm system should provide a signaling system for notifying plant personnel. Fire alarm systems should meet the following criteria:

1. The operation of an automatic fire suppression system initiates a fire alarm.

2. Automatic fire detection systems using smoke, heat, or flame detectors, as appropriate, are maintained for early detection of fires.

3. The alarm system maintains supervision of automatic fire suppression system control functions, as appropriate.

As applicable at the site, the inspector should consider verifying if the fire alarm systems are effectively maintained, surveillances are performed, and are capable of performing its intended function.

b. Fire Suppression Systems

The need for automatic fire suppression systems in plant areas during decommissioning activities may change, depending on the type of operations being performed in an area, the addition or removal of combustible materials, or the removal of radioactive materials and contamination. The licensee should review plant areas for changing conditions that could affect the need for automatic fire suppression systems. The inspector should verify that automatic fire suppression systems are installed, tested, and maintained in accordance with the fire hazard analysis and would effectively control and/or extinguish fires associated with the hazards in the selected area.

Manual fire suppression systems should be provided in the plant to supplement automatic fire suppression systems and to provide suppression coverage to areas not protected by automatic systems. Decommissioning activities may change the plant configuration and fire hazards, may require the construction of temporary enclosures or structures, and may necessitate the abandonment or removal of automatic fire suppression systems as facilities are dismantled or modified and radiological hazards are removed. Adequate manual fire suppression capability must be provided or maintained based on the decommissioning fire hazards analysis to ensure protection against fire-induced radioactive material releases.

The inspector should consider reviewing the capabilities of the following manual fire suppression systems:

1. Standpipe and hose systems should be maintained to provide manual fire suppression capabilities.

2. Outside hydrants and hose houses should be maintained to support manual fire suppression of internal fires and to protect against the threat of external exposure fires to those plant areas that contain radioactive materials or SSCs necessary for the prevention or mitigation of radioactive material releases.

3. If portable hose packs are used, training and drill conduct should be consistent with their usage.

4. If offsite fire responder equipment is credited for manual suppression, review the compatibility with plant water supply systems (e.g., water pressure requirements, connection compatibility).

The inspector should determine whether manual suppression systems are available, tested, and maintained in accordance with the fire hazard analysis and would effectively control and/or extinguish fires associated with the hazards in the selected area. The inspector should determine whether fire hose stations are installed at their designated locations; the general condition of hoses and hose stations is satisfactory (e.g., there is no corrosion or holes in, or chafing of, the hose; the nozzles are not mechanically

damaged and not obstructed; and the valve hand wheels are in place); and access to the hose stations is unobstructed and testing records indicate testing within the normal periodicity, if applicable. Further, the inspector should determine whether the fire hose lines are capable of reaching all necessary fire hazard locations.

c. Fire Water Supply

During decommissioning, the plant fire water supply system should be maintained, and the system should be capable of providing the maximum water flow needed to supply automatic fire suppression systems and manual firefighting. The following factors should be considered in determining the adequacy of the water supply:

1. Reliability of the water supply source, to provide maximum flow demand for a minimum of 2 hours per Regulatory Guide 1.191, Revision 1, Section C.4.3.1;

2. Availability of tanks or other water sources, pumps, fire hydrants, and distribution system;

3. Adequate flow and pressure to meet water flow demands of automatic or manual fire suppression, or both, at the point of delivery; and

4. Capacity of the water supply source and distribution system. If the water system is a combined domestic, process, and fire system, the system should be capable of supplying the maximum daily consumption or the peak hourly flow rate, whichever is higher, plus the maximum required fire flow.

Decommissioning activities may result in the isolation, removal, or abandonment of portions of the distribution system. The inspector should consider reviewing system changes to ensure that adequate flow and coverage are provided for the remaining plant areas that contain radioactive materials, present a fire exposure threat to areas containing radioactive materials, or include systems necessary to mitigate the release of radioactive materials.

The inspector should review the defueled fire hazard analysis to determine what the licensee is using for its fire water supply. If the licensee is using fire pumps, the inspector should verify if the pumping capability is operable and able to supply the water flow and pressure demand. The inspector should determine whether the general condition of yard fire hydrants is satisfactory to ensure water supplies are available in a fire emergency (e.g., material conditions such as mechanical damage and corrosion).

Some plants credited fire protection water for other than fire protection uses (e.g., utilizing the fire water pumps and water supply as makeup water to the spent fuel pool, station air compressor, emergency diesel generators, and certain security event scenarios). Inspectors should ensure that any non-fire suppression use of fire water will not impact the ability to meet the fire suppression water design demands.

d. Fire Barriers

Fire areas are established to prevent or restrict the propagation of fires from one area of a facility to another, to protect personnel, and to limit the consequences of a fire. Based on a defueled fire hazards analysis, fire areas may be redesignated to address the unique hazards and protection requirements of the decommissioning process. The

designation of fire areas should be based on consideration of the hazards present; the potential for a fire in a given area to result in an unacceptable release of radioactive materials; the ability to effectively contain, fight, and control the fire using manual suppression; and the ability of personnel to safely evacuate the plant.

Fire areas should be separated by fire-rated barriers. The fire resistance rating of a fire barrier should be commensurate with the potential fire severity in each fire area. The components of fire barriers are walls, ceilings, and floors, along with structural steel supports such as beams, joists, and columns and fireproofing material. Openings in a fire barrier should be sealed by the installation of fire dampers, fire door assemblies, fire window assemblies, fire-rated penetration seals, and special floor drains.

Fire barrier components and penetration seals should be qualified by testing. The defueled fire hazards analysis should identify and justify any unprotected openings in a fire barrier. The inspector should review that the fire barriers are effectively maintained, surveillances are performed, and the fire barriers can perform their intended function. During a plant tour, the inspector should visually inspect fire barriers associated with fire areas to ensure they are in good material condition and to ensure functionality. The inspector should review completed surveillances of selected fire doors, fire dampers, and fire barrier penetration seals to ensure that they are being properly inspected and maintained.

e. Fire Protection Equipment

Personnel protective equipment for fire brigades, including turnout gear and self-contained breathing apparatus, should regularly be inventoried, inspected, tested, and maintained to ensure proper performance. The inspector should determine whether the licensee is maintaining personnel protective equipment in accordance with their fire protection program.

Manual firefighting equipment, including portable and wheeled fire extinguishers, fire hoses, nozzles, tools, fittings, portable lighting, and communication and ventilation devices should be regularly inventoried, inspected, tested, and maintained to ensure proper operation in the event of a fire. The inspector should determine whether firefighting equipment and stations are properly maintained, inventoried, and ready for use. The inspector should verify that the general condition of portable fire extinguishers is satisfactory (e.g., there is no corrosion, the pressure gauge reads in the acceptable range, nozzles are clear and unobstructed, and charge test records indicate testing within the normal periodicity). Access to the fire extinguishers should be unobstructed by plant equipment or other work-related activities. As applicable, the inspector should verify that fire hoses are installed at their designated locations and the general condition of hoses and hose stations is satisfactory (e.g., no holes in or chafing of the hose, thenozzle not mechanically damaged and not obstructed, and valve hand wheels are in place).

03.04 Problem Identification and Resolution

Verify that the licensee is identifying problems related to the fire protection program at an appropriate threshold and entering them into the corrective action program. If applicable, for a sample of problems documented in the corrective action program, verify that the licensee has identified and implemented appropriate corrective actions.

Specific Guidance

In determining risk-significance of corrective action program entries for review, consider reviewing fire events (licensees may describe these as smoldering, ignition or heat events), fire protection related SSCs impairments, and missed or delayed surveillances of fire protection related SSCs.

64704-04 RESOURCE ESTIMATE

Note that for all decommissioning inspection activities, the frequency of performance, level of effort needed, and specific inspection requirements to be evaluated and verified vary based on the stage of decommissioning at the facility, the scope of licensee activities, and the overall decommissioning strategy chosen for the plant (i.e., SAFSTOR or DECON). IMC 2561 contains a discussion of the expected inspection frequency and resource estimates during each phase of decommissioning and should be used when planning resources to conduct this inspection.

64704-05 PROCEDURE COMPLETION

Inspection procedure completion is based on completion of the inspection procedure requirements at the frequency specified in IMC 2561 Appendix A. The inspector is not required to complete all of the inspection requirements listed in the IP, nor is the inspector limited to those inspection requirements listed if any additional safety concerns are identified. However, the objectives of the IP should be met. Due to variance in decommissioning strategies and timelines, subsequent inspections may be less comprehensive, based on the plant conditions and configurations. Inspection findings, open items, follow-up items, and conclusions shall be documented in accordance with IMC 0610 and other relevant regional or headquarters instructions. Inspections resulting from allegations will be documented and dispositioned in accordance with Management Directive 8.8.

64704-06 REFERENCES

IP 71111.05, “Fire Protection”

NRC Information Notice 2023-04, “Operating Experience Related to Fire Events at Decommissioning Nuclear Power Plants in the United States,” issued September 13, 2023, (ML23088A143)

NUREG/BR-0522, Revision 1, “Fire Protection for Operating Nuclear Power Plants and Decommissioning Reactors,” issued December 2022, (ML22340A499)

Regulatory Guide 1.191, Revision 1, “Fire Protection Program for Nuclear Power Plants During Decommissioning”

END

Attachment 1: Revision History for IP 64704

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	7/15/1981 CN 81-019	Initial Issuance in the SALP program.	N/A	N/A
	8/15/1981 CN 81-021	Revised in the SALP program	N/A	N/A
	3/18/1994 CN 94-008	Revised in the SALP program	N/A	N/A
	9/08/1997 CN 97-014	Revised in the SALP program	N/A	N/A
	6/24/1998 CN 98-010	Revised in the SALP program	N/A	N/A
N/A	ML20294A347 11/05/20 CN 20-059	Major revision. This procedure is a complete re-write and updated to include inspection requirements on fire protection previously listed in IP 71801. Revised to include feedback from inspectors, updated the format and include editorial changes. The content of this procedure was updated to focus on the inspector's efforts on risk informing the inspection.	N/A	ML20294A348
N/A	ML25139A096 06/27/25 CN 25-022	Major revision. The procedure was reorganized for easier readability. Revised to include inspector insights since the last revision and to further risk inform the procedure.	N/A	N/A