INSPECTION PROCEDURE 88055

FIRE PROTECTION (ANNUAL)

PROGRAM APPLICABILITY: 2600

88055-01 INSPECTION OBJECTIVES

01.01 The objectives of this procedure are to evaluate the operational status and material condition of the licensee or certificate holder's fire protection systems to determine whether the following are adequate:

a. Effectiveness of controls for combustibles and ignition sources within the plant;

b. Operability of fire detection and suppression equipment and systems;

c. The material condition of passive fire protection features; and

d. Effectiveness of compensatory measures in place for out-of-service, degraded or inoperable fire protection equipment, systems or features.

01.02 To assess the performance of the fire brigade.

88055-02 INSPECTION REQUIREMENTS

Selection of Fire Protection Features to be Reviewed. Fire protection requirements for license or certificate holders vary greatly because of the significant differences in operations at fuel cycle facilities and thus any safety or security impact from fire. As a result, the inspector should, as part of inspection preparation, review fire protection program documentation specific for the licensee or certificate holder to be inspected. This review should include a review of changes to the program since the last inspection. Specific requirements are documented in the regulations, the license or certificate, the Safety Analysis Report (SAR), the Integrated Safety Analysis (ISA), and licensee or certificate holder policies and procedures.

02.01 Program Implementation. The inspector will tour plant areas containing safety controls and items relied on for safety (IROFS) (for Part 70 licensees) (not necessarily limited to the top few contributors to overall plant fire risk) to assess the material condition of active and passive fire protection equipment, systems, and features and their operational lineup and readiness. For the areas selected, as applicable, evaluate the following:

a. Control of Transient Combustibles and Ignition Sources. Determine whether:

1. Transient combustible materials are being controlled in accordance with the licensee or certificate holder's procedures.

2. Hot work, welding, or cutting is being done in accordance with the licensee or certificate holder's procedures.

3. The facility work planning process organization has specific familiarity of locations where changes in plant conditions have occurred that require fire protection compensatory measures to be put in place (e.g., for inoperability of fire detection or suppression systems) to allow adjustments in planned work to minimize the introduction of combustibles or ignition sources (that could increase the likelihood of a fire or increase fire severity) into plant areas where degraded fire protection features or systems exist.

4. The work planning organization and associated work control process accepts responsibility for storage and handling of pre-staged work materials, including flammable and hazardous materials that are included in the pre-stage request.

5. Designated flammable/combustible liquid storage areas and floor drain systems in selected plant areas could affect plant safety controls and IROFS.

6. Flammable/combustible liquid spills, leakage or explosions associated with oil storage areas, large oil-filled transformers or batteries in or adjacent to the areas selected for inspection could affect safe operation of the facility.

b. Fire Detection Systems. Determine whether the physical condition of the fire detection devices is adequate and note any that show physical damage, blockage, or potential interference with functionality (see Subsection 02.01.g).

c. Water-based Fire Suppression Systems. Determine whether:

1. Sprinkler heads and nozzles are not obstructed by major overhead equipment (e.g., ventilation ducts).

2. Water supply control valves to the system are open and the fire water supply and pumping capability is operable and capable of supplying the water supply demand of the system. (Verify through visual observation or surveillance record.)

3. Material conditions such as mechanical damage, painted sprinkler heads, corrosion, etc., will not affect performance of the system.

d. Gaseous Fire Suppression Systems. Determine whether:

1. Gaseous suppression system (e.g., Halon or carbon dioxide (CO_2)) nozzles are obstructed or blocked by plant equipment such that gas dispersal would be significantly impeded.

2. Suppression agent charge pressure is within the normal band, extinguishing agent supply valves are open, and the system is in the appropriate mode.

3. Fire damper doors, where applicable, are unobstructed so that they will be permitted to close automatically upon actuation of the gaseous system.

4. Fire barrier penetration seals, where applicable, are sealed and in good condition.

5. Material conditions such as mechanical damage, corrosion, damage to doors or dampers, open penetrations, or nozzles blocked by plant equipment that may affect performance of the system are adequate.

e. Manual Firefighting Equipment and Capability. Determine whether:

1. Portable fire extinguishers are provided at their designated locations in or near the area being inspected, and access to the fire extinguishers is unobstructed by plant equipment or other work related activities.

2. The general condition of fire extinguishers is satisfactory (e.g., pressure gauge reads in the acceptable range, nozzles are clear and unobstructed, charge test records indicate testing within the normal periodicity).

3. 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, nozzle not mechanically damaged and not obstructed, valve hand wheels in place and operable).

4. The fire hoses are installed at their designated locations. The attached 100 feet of fire hose (plus the 30 feet for water stream) cover the complete area including the overhead. Verify that the hose is properly connected to the standpipe hose connection and is properly placed on the hose rack. Verify that the shutoff valve is closed, hand wheel is in place, and valve is not leaking (e. g., compress the first hose section from hose connection to rack for signs of water in the hose).

5. There is a properly calibrated/adjusted pressure reduction device, if installed (25 percent or less calibration/adjustment error).

6. Any fire hoses in the hose rack are damaged. Verify that the exterior of the hose jacket is dry with no signs of excessive dirt, debris, cuts, abrasions, or other obvious damage.

7. The hose rack swings freely. Verify that hose rack, hose station piping, and supports in the general area have no excessive rust and corrosion.

8. Damaged, missing, clogged, or incorrect nozzles (non Underwriters Laboratories/Factory Mutual (UL/FM) electric safe nozzles) are attached to

the system.

9. Water supply control valves to the standpipe system are open and the fire water supply and pumping capability is operable and capable of supplying the water flow and pressure demand.

10. Access to the hose stations is unobstructed by plant equipment or work-related activities.

f. Passive Fire Protection Features. Determine whether:

1. Blanket material for electrical raceway fire barriers in systems required to provide necessary power for safety controls or IROFS, such as cable tray fire wraps for cables, are in good condition with no cracks, gouges, or holes in the barrier material, and no gaps in the material at joints or seams, and that banding, wire tie, and other fastener pattern and spacing appears appropriate.

2. Fire doors close without dragging or sticking (e.g., due to fire door damage from previous obstructions), and that the door latching hardware engages and functions securely.

3. Material conditions of ventilation system fire dampers including fusible links, where applicable, ensure unobstructed operability. For those dampers which can not be readily observed in the selected plant areas, review the licensee or certificate holder's surveillance efforts directed towards verifying the continuing operability of ventilation fire dampers.

4. Structural steel fire proofing, such as fibrous or concrete encapsulation, is installed in such a way that the structural steel is uniformly covered (no bare areas).

5. Fire barrier and electrical and piping penetration seals are not missing from locations in which they appear to be needed to complete a fire barrier wall, floor, or ceiling and seals appear to be properly installed and in good condition.

6. Oil collection systems designed to collect oil leakage and spray have been installed and properly maintained.

g. Compensatory Measures. Determine whether:

1. Compensatory measures are put in place by the licensee or certificate holder for out-of-service, degraded or inoperable required fire protection equipment, systems or features (e.g., detection and suppression systems and equipment, passive fire barrier features, etc.).

2. Compensatory measures are adequate to provide at least the same reduction in fire risk (considering the out of service time) as the fire protection

item(s) being compensated for.

3. Licensee or certificate holder's plans for permanent corrective actions, including effectiveness in returning the equipment to service in a reasonable period of time, are adequate.

02.02 Annual Inspection.[1] During the annual observation of a fire brigade drill in a plant area important to safety, evaluate the readiness of the licensee or certificate holder's personnel to prevent and fight fires, including the following aspects:

a. Protective clothing/turnout gear is properly donned.

b. Self-contained breathing apparatus (SCBA) equipment is properly worn and used.

c. Fire hose lines are capable of reaching all necessary fire hazard locations, the lines are laid out without flow constrictions, the hose is simulated being charged with water, and the nozzle is pattern (flow stream) tested prior to entering the fire area of concern.

d. The fire area of concern is entered in a controlled manner (e.g., fire brigade members stay low to the floor and feel the door for heat prior to entry into the fire area of concern).

e. Sufficient fire fighting equipment is brought to the scene by the fire brigade to properly perform their firefighting duties.

f. The fire brigade leader's fire fighting directions are thorough, clear, and effective.

g. Radio communications with the plant operators and between fire brigade members are efficient and effective.

h. Members of the fire brigade check for fire victims and propagation into other plant areas.

i. Effective smoke removal operations were simulated.

j. The fire fighting pre-plan strategies were used.

k. The licensee or certificate holder's pre-planned drill scenario was followed, and the drill objectives acceptance criteria were met.

02.03 Identification and Resolution of Problems. Determine whether the licensee or certificate holder is identifying safety control or IROFS fire protection operability problems at an appropriate threshold and entering them into the corrective action program. Determine, for selected licensee or certificate holder identified items, whether effective corrective actions have been taken to ensure the operability of fire protection systems.

1This inspection will be performed by resident inspectors at sites with resident inspectors, otherwise by regional inspectors.

88055-03 INSPECTION GUIDANCE

General Guidance. The inspector should note the material condition and operational status (rather than the design) of fire detection and suppression systems and fire barriers used to prevent fire damage or fire propagation.

For those fire protection structures, systems, and components installed to satisfy U.S. Nuclear Regulatory Commission (NRC) requirements designed to National Fire Protection Association (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. Normally the license application identified the Code and date required of each licensee or certificate holder.

Deviations from the codes should be identified and justified in the license application or Fire Hazards Analysis (FHA). A licensee or certificate holder may apply the equivalency concept in meeting the provisions of the NFPA codes and standards. When the licensee or certificate holder 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 Materials Safety and Safeguards (NMSS), NRC, or designee, consistent with the authority specified in 10 CFR 1.42.

Selection of Fire Protection Features to be Reviewed. The inspector should, as part of inspection preparation, review license, license condition, license application, or technical safety requirements (TSR) specific to the licensee or certificate holder to be inspected. In addition, in preparation for the inspection, the inspector should discuss with the project inspector and resident inspection staff, where applicable, any fire protection equipment availability or reliability problems (such as recurring failures or failures resulting in reportable events) the licensee or certificate holder has experienced since the last annual inspection. Select from this list the fire protection issues that could impact the more risk-significant operations to review during the inspection. In addition, once on site, the inspector should initially determine what hot work, welding, or cutting is scheduled to be performed by the licensee or certificate holder during the period of the inspection. From this, the inspector should select sample activities to observe during the inspection. The inspector should use the ISA Summary or other safety analysis to determine the risk-significant operations. Inform a licensee or certificate holder representative that you would like to be kept informed of any change in the schedule of this work to assure that an inspector observes them.

03.01 Program Implementation.

a. Control of Transient Combustibles and Ignition Sources. Metals such as uranium and zirconium, and their alloys, are known to be combustible, especially when in a finely divided form. Through interviews with personnel, review of maintenance and

operational logs, and observation of fire protection equipment as well as work in progress, determine that :

1. Machining Operations of Combustible Metals.

   (a) Machining operations in the facility such as sawing, grinding, machining, and abrasive cutting which have the potential for combustible dust cloud formation and combustible scrap and swarf accumulation, are adequately controlled. Fire protection measures for these metals are similar. NFPA 484, “Standard for Combustibles Metals,” provides guidance.

   (b) No open flames are permitted in the areas where machining operations of combustible metals are performed. If maintenance operations, such as welding, are to be performed in the vicinity, machining operations should be halted, and metal scraps should be removed.

   (c) Machining operations on combustible metals are performed in enclosures with a dust-collection system in operation. The collected dust should be ducted to a dust collector and also a HEPA filter, if required, for removal of radioactive particles. The collection hood and duct leading to the filter should be designed to minimize deposition of the fines and to facilitate cleaning.

   (d) Scrap and swarf generated by machining operations and accumulated in the immediate area are swept as frequently as necessary and collected under water in covered metal containers. Such collections should be removed daily from the process areas. Dust and sludge collected in the dust separators and ducts should be removed as often as necessary.

   (e) Extinguishing agents suitable for the particular metal fire, as well as suitable scoops or applicators, are readily available to the operator performing the machining.

2. Incinerators.

   (a) Incinerators are separated from the remainder of the facility by fire barriers having a minimum 1-hour fire resistance rating.

   (b) The exhaust from an incinerator that is used to burn radioactive contaminated waste is ducted to a filtration system before release to the environment. The exhaust may also be ducted to the facility off-gas system.

3. Boilers and Boiler Furnaces.

   (a) Boilers for the supply of steam for process operation and boiler

furnaces are separated from the remainder of the facility by fire barriers having a minimum 1-hour fire resistance rating.

(b) The fuel storage tanks are separated from the furnace area by fire barriers having a minimum 1-hour fire resistance rating and the fuel lines are laid out to minimize possibility of damage.

4. Stationary Combustion Engines.

(a) Stationary combustion engines located in part of a structure housing fuel processes are in enclosures having a fire resistance rating of at least 1 hour.

(b) Fuel storage tanks, except for day tanks are located outside the room.

(c) The engine exhaust system will prevent ignition of any combustible material by contact with hot metal surfaces or by leaking exhaust gases or sparks.

5. Storage and Handling of Flammable and Combustible Liquids and Gases.

(a) Indoor storage of flammable and combustible liquids are only permitted in limited quantities in approved closed containers for the purpose of day-use (such as for diesel engine operation) and maintenance work.

(b) Appropriate portable fire extinguishers are available in the affected area.

b. Fire Detection Systems.

1. Operators receive visual and audible indication, either from a control room or at a central staffed location, that a fire detection system has been activated.

2. Operators receive indication of where the activated fire detection system is located.

3. Each fire detection panel receives power from two different sources.

4. All fire detection circuits are electronically supervised to provide indication (trouble alarm) of any identified faulted condition.

c. Water-based Fire Suppression Systems.

1. Operators receive visual and audible indication, either from a control room or at a central staffed location, that the water-based fire suppression system has been activated.

2. Operators receive indication of where the activated water-based fire

suppression system is located.

3. Operators have written procedures available to indicate what actions are required to manually place the water-based fire suppression systems into operation.

4. The operation of the water-based fire suppression system is not unacceptably impaired if the system is actuated by the fire detection system and the fire detection system is inoperable, reacts too slowly, or its critical detection attributes (See Subsection 02.01.b.) are degraded.

5. Water supply control valves to the system are open and the fire water supply and pumping capability is operable and capable of supplying the water supply demand of the system. (Verify through visual observation or surveillance record.)

6. The system provides adequate water spray/sprinkler coverage for the in situ hazard the system is protecting.

7. Sprinkler heads and nozzles are not missing, not the wrong type, or are not obstructed by major overhead equipment (e.g., ventilation ducts). A minimum of 18 inches of clear space below the sprinkler deflector shall be maintained.

8. Material conditions such as mechanical damage, painted sprinkler heads, corrosion, etc., will not affect performance of the system.

9. Adequate drainage is provided in areas protected by water suppression systems. Verify that a protected room or area has a proper floor drainage system (floor drains are not restricted with debris, plugged, or blanked off) in areas where either water-based fixed suppression systems and manual fire brigade hose streams are expected. Determine whether these fire suppression activities could impact operation of critical equipment safety controls (e.g., sprinkler-caused flooding of other safety controls).

10. Building modifications to the fire have not compromised the effectiveness of the suppression system.

11. Any modifications to the sprinkler system (i.e. additional sprinklers to cover an additional hazard) do not degrade the hydraulic performance of the original designed system. (Review hydraulic analysis of modification.)

d. Gaseous Fire Suppression Systems.

1. Operators receive visual and audible indication, either from a control room or at a central staffed location, that the gaseous fire suppression system has been activated.

2. Operators receive indication of where the activated gaseous fire suppression

system is located.

3. Operators have written procedures available to indicate what actions are required to manually place the gaseous fire suppression system into operation and know how to use them.

4. The system design ensures that if the gaseous fire suppression system is actuated by the fire detection system and the fire detection system is inoperable, reacts too slowly, or its critical detection attributes (See Subsection 02.01.b.) are degraded, compensatory actions are in place to ensure that the operation of the associated gaseous fire suppression system is not impaired.

5. Gaseous suppression system (e.g., Halon or CO2) nozzles are not missing, obstructed, or blocked by plant equipment such that gas dispersal would be significantly impeded.

6. Suppression agent charge pressure is within the normal band, extinguishing agent control system actuation supply valves are open, extinguishing agent main supply valves are open, and the system is in the appropriate standby mode.

7. Where applicable, dampers/doors are unobstructed so that they will be permitted to close automatically upon actuation of the gaseous system.

8. The room enclosure's ability to maintain gas concentration is not degraded (e.g., worn-out fire door weather stripping, minimal penetration seal degradation — minor cracks, no ventilation system isolation, removed or missing dampers), or more leakage paths than originally tested.

9. Material conditions such as mechanical damage, corrosion, damage to fire doors; electric thermal or pneumatic link actuators; fire dampers; or open penetrations, that may affect the performance of the system will not hinder safe operation of the plant.

e. Manual Firefighting Equipment and Capability. Yard fire hydrants and hydrant hose houses. Visually inspect the physical condition and structural integrity of each hydrant hose house listed in the licensee or certificate holder's fire protection program. Observe and visually verify that equipment required by the licensee or certificate holder's program procedures is present in each hydrant hose house and is in place and in proper working condition. Determine that:

1. Hoses have a hydrostatic test date which will not exceed one year.

2. Fire fighting foam containers have a shelf life date which has not be exceeded or expired.

3. Hoses do not have signs of damage or deterioration.

4. The fire hydrant and equipment stored with the Fire Fighting Foam is in proper working condition (i.e., visually inspect, operates smoothly, free of obstructions).

f. Passive Fire Protection Features.

1. Fireproofing.

(a) Evaluations and/or fire tests that were performed to verify that each type of fireproofing will maintain the integrity of structural members for the time specified have not been invalidated by plant changes. (See the UL Fire Resistance Directory.)

(b) Fire ratings of fireproofing systems are compatible with the anticipated fire duration and intensity. Verify through observation that no physical damage exists which affects the structural integrity of the fire proof material allowing a direct path for flame/hot gas travel to the protected component (i.e., loose or sagging fire proof material wrap, water damage, loose bands, etc.).

2. Fire Doors.

(a) Evaluations and/or fire tests were performed to verify that each type of fire door will maintain the integrity of structural members for the time specified. (See the UL Fire Resistance Directory.)

(b) Fire doors and frames are UL labeled and the label fire ratings of door assemblies are compatible with the fire ratings of their associated fire barriers.

(c) Fire doors close freely and door latch hardware engages and latches securely. [Generally, for the metal doors encountered during inspections, a 3 hour door needs a 5/8 inch latch throw and a 1 hour door needs 1/2 inch." (Refer to NFPA 80 if an issue arises)].

(d) The fire door frame and door to floor clearance gaps are not excessive (they exceed the criteria of NFPA 80).

3. Ventilation Fire Dampers.

(a) Accessible fire dampers are UL labeled and the label fire ratings of dampers are compatible with the fire ratings of their associated fire barriers.

(b) The fire damper has no obvious signs of damage by visual verification. Verify through observation that the fire damper fusible link is properly installed and the fire damper has no obstruction which would prevent closure.

(c) The fire damper has no buildup of dirt, dust, oil, rust, or other items on the track or coiled springs that would interfere with proper operation.

4. Penetration Seals. Fire ratings for accessible fire penetration seals should be compatible with the fire ratings of their associated fire barriers. Visually inspect the physical condition and structural integrity of each penetration within a fire wall, floor, or ceiling for the following. Verify by observation that:

(a) The penetration has a seal installed and there is NO passage of light or air movement through the sealant.

(b) The foamed penetration seal surface has no cracks greater then 1/8 inch in width in the functional portion of the sealant.

(c) The foamed penetration seal surface has no holes greater then 1 inch in depth in the functional portion of the sealant.

(d) There are no tears or rips in the functional portion of the sealant. Cables pulled away from the seal do not result in cracks >1/8 inch in width, holes > 1 inch in depth or tears or rips in the functional portion of the sealant.

(e) There are no open (unsealed) conduits or open pipes protruding through the seal and terminating on either side of the fire barrier.

(f) The damming boards, when installed, such as Carborundum, Duraboard, Durablanket, or Masonite board are an integral part of the seal. Verify that the damming boards and seams or TSI material is undamaged and in its originally installed condition.

5. Electrical Raceway Fire Barrier Systems (ERFBS). Determine by observation that ERFBS required to provide necessary power for safety controls or IROFS, such as cable tray fire wraps for cables and blanket material are in good condition. Visually inspect the physical condition and structural integrity of each ERFBS for the following:

(a) Wrap materials are continuous and attached securely in place, particularly check that material joints or seams are not separated from attachments or have gaps at the fire wall structure.

(b) No exposed metal which might act as an thermal short-circuit from structural supports (i.e., all attachment supports, stud bolts, nuts, and washers are properly covered with the fireproofing material).

(c) Banding, wire tie, and other fastener pattern and spacing appears appropriate.

(d) No breaks, tears, cracks, or holes.

(e) No crumbling of material.

(f) No water damage.

(g) No sagging.

(h) No blisters or bubbles.

6. Oil Spill, Leakage and Containment/Collection Systems. Oil leakage and containment/collection systems are fire protection features designed to collect oil leakage, spills, and spray from equipment and/or storage tanks that contain flammable or combustible liquids (See NFPA 30, "Flammable and Combustible Liquids Code"). Visually inspect the physical condition and structural integrity of each oil leakage and containment/collection system for the following:

(a) The oil leakage and containment/collection system has sufficient containment volume for the largest container allowed to prevent overflow from endangering important structures, facilities, or safety systems.

(b) The containment/collection containment dike is liquid-tight.

(c) Any piping passing through the dike walls have closed isolation block valves installed. Verify that the valve(s) access under fire conditions is permitted without entering the diked area. Where provision is made for draining water from diked areas, the drains should be controlled to prevent combustible liquids from entering areas where they would constitute a hazard to important structures, facilities, or safety systems.

g. Compensatory Measures. Each echelon of fire protection defense in depth (i.e., prevent fires, detect and suppress fires, and the design of safety systems to limit fire damage), should meet certain minimum requirements; however, strengthening any one can compensate in some measure for weaknesses, known or unknown, in others. In some cases, reductions in defense in depth can be immediately corrected. For example, combustibles can be removed if found in a combustible free zone. In other cases, more time is needed to correct the problem (e.g., repair an inoperable fire detection system or install a missing fire barrier). In still other cases, fire protection features are purposefully removed from service (e.g., a fire barrier penetration seal may be removed to allow a new cable run). When immediate corrective actions cannot be taken, compensatory measures are implemented to mitigate the increased fire risk created by the degraded, inoperable, or nonconforming condition until permanent corrective actions can be implemented. The use of compensatory measures, on a short term basis, is an integral part of licensee's or certificate holder's fire protection programs. In most cases, such measures can effectively compensate for the reduction in fire protection defense-in-depth until the operability of the degraded or inoperable fire protection feature can be restored or the nonconformance can be corrected. For

typical fire protection system deficiencies (e.g., inoperable fire detection and suppression systems) the plant administrative procedures should specify the appropriate compensatory measures. Fire watches are the most common form of compensatory measure for typical fire protection system deficiencies. Fire watches are personnel trained to inspect for the control of ignition sources, fire hazards, and combustible materials; to look for signs of incipient fires; to provide prompt notification of fire hazards and fires; and, in some cases, to take actions to begin fire suppression activities. The primary purpose of the fire watch is to look for fire hazards and other conditions that could lead to a fire. Therefore, the fire watch strengthens the first echelon of fire protection defense in depth (fire prevention) by compensating for the weakness introduced by the inoperable, degraded, or nonconforming condition. Fire watches may also detect fires, call out the fire brigade, give exact information regarding the nature and location of the fire to the fire brigade, and initiate fire suppression activities for incipient stage fires. These actions all strengthen the second echelon of fire protection defense in depth (fire detection and suppression). (Whether or not a fire watch engages in incipient stage fire fighting activities is based on the individuals' training and procedures.)

1. For identified impaired fire protection features, assure that compensatory actions (usually a posted fire watch) are established and continue until such time that the component is restored.

2. Ensure that the duties of posted compensatory action fire watchers are adequate and fire watch rounds are completed within specified procedural time frames.

03.02 Annual Inspection of the Fire Brigade Drill.[2] If the drill is not scheduled to take place during the inspection, the inspection requirement may be accomplished by interviewing Fire Brigade members to determine the actions they would take in the event of a fire response. Different fire scenarios should be provided to determine the extent of Fire Brigade training.

03.03 Identification and Resolution of Problems. No specific guidance provided.

88055-04 INSPECTION RESOURCES

Approximately 28 hours of actual inspection time will be required to perform this procedure. The normal frequency of inspection is annual.

88055-05 REFERENCES

National Fire Protection Association (NFPA) Codes.

[2]This inspection will be performed by resident inspectors at sites with resident inspectors, otherwise by regional inspectors.

NFPA 10, "Portable Fire Extinguishers"

NFPA 11, "Low Expansion Foam and Combined Agent Systems"

NFPA 11A, "Medium- and High-Expansion Foam Systems"

NFPA 12, "Carbon Dioxide Extinguishing Systems"

NFPA 12A, "Halon 1301 Fire Extinguishing Systems"

NFPA 12B, "Halon 1211 Fire Extinguishing Systems"

NFPA 13, "Sprinkler Systems"

NFPA 14, "Standpipe and Hose Systems"

NFPA 15, "Water Spray Fixed Systems for Fire Protection"

NFPA 16, "Deluge Foam-Water Sprinkler and Foam-Water Spray Systems"

NFPA 20, "Centrifugal Fire Pumps"

NFPA 24, "Private Fire Service Mains and Their Appurtenances"

NFPA 30, "Flammable and Combustible Liquids Code"

NFPA 31, "Oil Burning Equipment"

NFPA 37, "Stationary Combustion Engines and Gas Turbines"

NFPA 45, "Laboratories Using Chemicals"

NFPA 50, "Bulk Oxygen Systems at Consumer Sites"

NFPA 50B, "Liquified Hydrogen Systems at Consumer Sites"

NFPA 51B, "Fire Prevention in Use of Cutting and Welding Processes"

NFPA 54, "ANSI Z223.1-1984, National Fuel Gas Code"

NFPA 69, "Explosion Prevention Systems"

NFPA 70, "National Electrical Code"

NFPA 70B, "Electrical Equipment Maintenance"

NFPA 70E, "Electrical Safety Requirements for Employee Workplaces"

NFPA 72D, "Proprietary Protective Signaling Systems"

NFPA 72E, "Automatic Fire Detectors"

NFPA 75, "Electronic Computer/Data Processing Equipment"

NFPA 77, "Static Electricity"

NFPA 78, "Lightning Protection Code"

NFPA 79, "Industrial Machinery"

NFPA 80, "Fire Doors and Windows"

NFPA 80A, "Protection of Buildings from Exterior Fire Exposures"

NFPA 85D, "Fuel Oil-Fired Multiple Burner Boiler-Furnaces"

NFPA 86C, "Industrial Furnaces Using a Special Processing Atmosphere"

NFPA 90A, "Air Conditioning and Ventilating Systems"

NFPA 90B, "Warm Air Heating and Air Conditioning Systems"

NFPA 101, "Life Safety Code"

NFPA 204M, "Smoke and Heat Venting"

NFPA 220, "Types of Building Construction"

NFPA 251, "Fire Tests of Building Construction and Materials"

NFPA 321, "Basic Classification of Flammable and Combustible Liquids"

NFPA 482, "Production, Processing, Handling and Storage of Zirconium"

NFPA 600, "Private Fire Brigades"

NFPA 801, "Facilities Handling Radioactive Materials"

NFPA 803, "Light Water-Cooled Nuclear Reactors"

05.02 U.S. Nuclear Regulatory Commission Documents.

NUREG 0762, "Standard Format and Content for Emergency Plans for Fuel Cycle and Materials Facilities," Rev. 1, November 1987

NUREG 0800, Standard Review Plan 9.5.1, "Guidelines for Fire Protection for Nuclear Power Plants," Rev. 2, July 1981

Draft Regulatory Guide No. DG 3006, "Standard Format and Content for Fire Protection Sections of License Applications for Fuel Cycle Facilities," September 1990

Federal Register, "Guidance on Management Controls/Quality Assurance, Requirements for Operation, Chemical Safety, and Fire Protection for Fuel Cycle Facilities," Vol. 54, No. 53, March 1989

American National Standards Institute, N665-1985, "Facilities for Fabricating Fuel for Light Water Reactors (LWR) - Fire Protection"

American National Standards Institute/American Society of Heating, Refrigeration, and Air Conditioning Engineers, ANSI/ASHRAE 15, "Safety Code for Mechanical Refrigeration"

American Society for Testing and Materials, ASTM E-84, "Surface Burning Characteristics of Building Materials," 1976

American Society for Testing and Materials, ASTM E-119, "Fire Test of Building Construction and Materials," 1976

Factory Mutual System Approval Guide, "Equipment, Materials, Services for Conservation of Property"

National Fire Protection Association, Fire Protection Handbook

Underwriters Laboratories Standard UL 555, "Standard for Fire Dampers and Ceiling Dampers"

Underwriters Laboratories Standard UL 586, (ANSI B 132.1), "High-Efficiency Air Filtration Units"

Underwriters Laboratories, Building Materials Directory

END

ATTACHMENT 1

Revision History for IP 88055

Commitment Tracking Number	Issue Date	Description of Change	Training Needed	Training Completion Date	Comment Resolution Accession Number
N/A	09/05/06 CN 06-020	This document has been revised to: (1) emphasize the risk-informed, performance-based approach to inspection, (2) impose changes to the core inspection program based on operating experience, and (3) remove completed or obsolete MCs and incorporate other fuel cycle MCs into a central location.	None	N/A	ML061790337
N/A	08/19/08 CN 08-024	This document has been revised to add more guidance into the Compensatory Measures and Annual Inspection of the Fire Brigade Drill sections.	None	N/A	ML080880471