Fire Safety Systems Maintenance Information

Section 5 Excerpt from Tynes Bay Waste to Energy Facility Fire Safety Plan Manual (with modifications)

November 2021

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5 Fire Safety Systems Maintenance Information

5.1 Introduction

The fire safety systems in the Tynes Bay Energy Facility are required to be tested and maintained according to the provisions of the 2003 International Fire Code and NFPA 25, "*Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*". The facility's Maintenance Director will be responsible for administering this task.

This module is divided into three sections:

- Section A – Description of the Fire Safety Systems.
- Section B – Fire Safety Maintenance Schedule.
- Section C – Fire Safety Systems Maintenance Drawings.

Section A – Details the fire safety systems that are specific to your facility. All important information should be included in this section so that the Plant Manager, Maintenance Director and maintenance staff can familiarize themselves with the fire safety systems.

Section B – Details the fire safety maintenance schedule for the fire safety systems. The schedule is divided according to frequency of maintenance and skill level required. This is an important section for the Plant Manager, maintenance staff, and person(s) in charge of inspecting or testing specific components of the fire safety systems, depending on the required skill level.

Section C – Details all the fire safety systems maintenance drawings that will be used by the appropriate personnel to familiarize themselves with the location of fire safety system components.

Section A
Description of Fire Safety Systems

Description of Fire Safety Systems

The following section describes the fire safety systems found in the Tynes Bay Energy Facility.

Sprinkler System

The building is partially protected by an automatic electrically supervised sprinkler system. Wet pipe sprinkler systems provide automatic sprinkler protection for the majority of the protected areas. Each wet pipe system includes a control valve, check valve, and flow switch. Refer to Image 1. Preaction sprinkler systems are provided for water-sensitive areas such as the Electrical Chase, the MCC Room, the Compressor Room, the Control Room, the Turbine Hall, and the Cable Trenches. Each preaction system includes a preaction valve complete with trim, a check valve, and control valves. Refer to Image 2. Deluge systems provide protection for the two exterior transformers. Each deluge system includes a deluge valve complete with a check valve, and control valves. Refer to Image 3. A clean agent suppression system is provided for the Control Room, including beneath the raised floor. The clean agent suppression system includes Novec 1230 clean agent storage cylinders located in the electrical chase. Refer to Images 4 and 5.

Image 1: Wet Pipe Sprinkler System Riser

Image 2: Preaction Sprinkler System Riser

Image 3: Deluge Sprinkler System Riser

Image 4: Clean Agent Suppression System Panel

Image 5: Clean Agent Suppression System Cylinder

Standpipe System

The building features a standpipe riser in the central stairwell with 65 mm (2½") valves located on all three levels. A standpipe riser with 65 mm (2½") connections is also included in the Boiler House. The Ash Plant is served by 65 mm (2½") valves located on the exterior of the building. Refer to Images 6, 7, and 8.

Image 6: Hose Valve (Main Building)

Image 7: Hose Valve (Boiler House)

Image 8: Hose Valve (Ash Plant)

Hose Cabinets, Hose Reels and Water Monitors

Hose cabinets are located throughout the facility. They are fed from the sprinkler system main. Each cabinet is equipped with a 65 mm (2½") hose valves and a 38 mm (1½") hose. The supply piping to each hose cabinet includes a control valve that is monitored by the fire alarm system. Refer to Image 9. Fire Hydrant Equipment cabinets are located on the exterior perimeter of the building. These cabinets include 65 mm (2½") hose and nozzles for use by the fire service. Refer to Images 10 and 11. Hose reels and water monitors are also located in both the Tipping and Bailing Hall. Refer to Images 12 and 13.

Image 9: Hose Cabinet

Image 10: Fire Hydrant Equipment Cabinet

Image 11: Fire Hydrant Equipment Cabinet

Image 12: Hose Reel

Image 13: Water Monitor

Fire Pumps

The sprinkler and standpipe systems are served by an Aurora electric fire pump that will boost the water pressure to provide supply to the facility. An Aurora diesel fire pump is also provided as a back-up to the electric pump. Motorized gate valves control the water supply to the fire pumps. Refer to Images 14 and 15.

Image 14: Electric Fire Pump

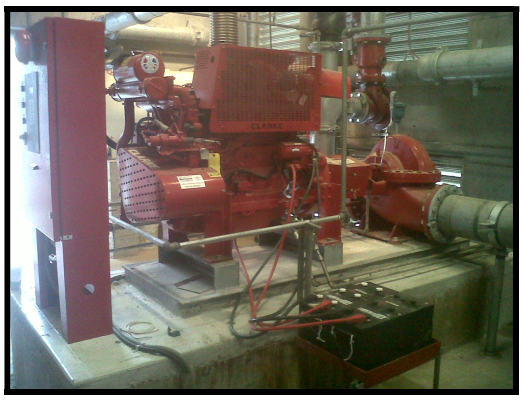

Image 15: Diesel Fire Pump

The sprinkler and standpipe systems can be boosted by a fire service pumper truck via a Siamese connection located on the exterior column adjacent to the Maintenance Shop on the west side of the main building. Refer to Image 16.

Image 16: Siamese Connection

Water Supply

Two water storage tanks are provided for the facility water supply. The tanks are located underneath the floor slab of the Tipping Hall. The total water reserved for fire protection in the tanks is 1,061,000 Liters (280,278 US gallons).

Six fire hydrants supplied from the fire ring main are located around the facility. Refer to Image 17. Two dry fire hydrants are also located in the wood yard and are supplied by the Fire Service pumper trucks that draft water from the storage tank of the Sea Water Treatment Plant and flow through the dry hydrant Siamese connection. Refer to Images 18 and 19. An additional wall hydrant is located adjacent to the pump room (north of the Bailing Hall Warehouse). Refer to Image 20.

Image 17: Fire Hydrant

Image 18: Dry Fire Hydrant Siamese Connection

Image 19: Seawater Plant Hydrant

Image 20: Wall Hydrant (Pump Room)

System Zoning

The building's sprinkler system is divided into multiple zones which match the zoning of the building's fire alarm system.

Fire Alarm Zone Number	Area	Type of Sprinkler Protection
1	North Transformer	Deluge System
2	South Transformer	Deluge System
3	Exterior Trench	Preaction System
4	Maintenance Shop	Wet Pipe System
5	High Voltage and Compressor Rooms	Preaction System
6	Turbine Wall	Preaction System
7	Boiler House	---------
9	Second Floor Storage	Wet Pipe System
10	MCC Room	Preaction System
11	Precipitators	---------
12	Electrical Chase	Preaction System
13	Administration Level 1	---------
14	Administration Level 2	---------
15	Administration Level 3	---------
16	Administration Level 4	---------
17	Shredder/Compactor	---------
18	Administration Level 5	---------
19	Control Room (Level 5)	Preaction System and Clean Agent Suppression System
20	Administration Level 6	---------
21	Refuse Pit	Wet Pipe System

Fire Alarm Zone Number	Area	Type of Sprinkler Protection
22	Tipping Hall	Wet Pipe System
23	Bailing Hall	Wet Pipe System
24	Fire Pump Room	Wet Pipe System
25	Storage Below Refuse Pit	Wet Pipe System
26	Analyze House	---------
27	Ash Processing Building	---------

Fire Detection and Alarm System

The Tynes Bay Energy Facility is equipped with an addressable two stage fire alarm and detection system complete with intelligent control panels that create a distributed peer-to-peer system. Fire alarm panel locations and descriptions are as follows:

- Main Fire Alarm Control Panel and Graphic Annunciator – The main fire alarm control panel and graphic annunciator are located in the Control Room. Network panels are located in the Sea Water Pumping Station, the MCC Room and the Ash Processing Building Control Room. Refer to Images 21 and 22.

Image 21: Main Fire Alarm Control Panel

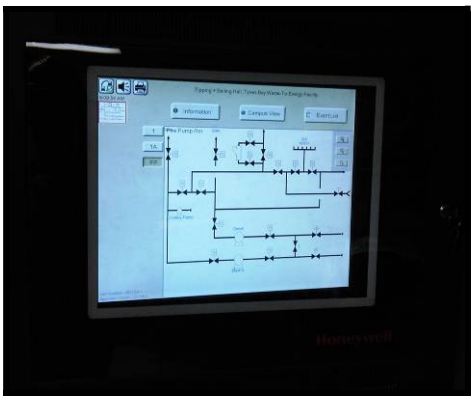

Image 22: Graphic Annunciator

- Remote Annunciator Panels – Remote annunciator panels are located in the Maintenance Shop Valve Room, the Fire Pump Room and the vestibule adjacent to security. Refer to Image 23.

Image 23: Remote Annunciator Panel

The fire alarm system is monitored 24 hours a day.

Detection is provided by means of:

- Sprinkler system flow switches. Refer to Image 24.

Image 24: Sprinkler System Flow Switch

- Smoke Detectors. Refer to Image 25.

Image 25: Smoke Detector

- Fire Alarm Pull Stations. Refer to Image 26.

Image 26: Fire Alarm Pull Station

- Flame Detectors. Refer to Image 27.

Image 27: Flame Detector

- Heat Detectors. Refer to Image 28.

Image 28: Heat Detector

- Linear Heat Detection. Refer to Image 29.

Image 29: Linear Heat Detection

Detection devices within the building are monitored by the fire alarm system. Upon activation of a detection device, a local alarm will sound and will also send a supervisory signal to the main fire alarm panel.

A Stage 1 alarm will be initiated upon activation of a detection device and will send a Stage 1 alarm to the area where the device has been activated.

The fire alarm system will then enter a Stage 2 alarm under the following conditions:

- Upon initiation of a Stage 2 alarm at the main fire alarm control panel or via a key switch in a fire alarm pull station.

- Upon activation of a second detection device (i.e. pull station).

Upon entering a Stage 2 alarm condition, the horn/strobes located throughout the building will sound continuously. Refer Image 30.

Image 30: Horn/Strobe Unit

An auto dialer is provided for transmitting alarm signals to a central station.

Egress Systems Applying to Corridors and Access to Exits

Exit doors and exit stairs located throughout the building provide access to the exterior in the event that a building evacuation is required.

Fire Separations

Fire separation involves dividing a building into separate compartments whose boundaries limit the spread of smoke and fire to an adjacent compartment. Refer to Image 31.

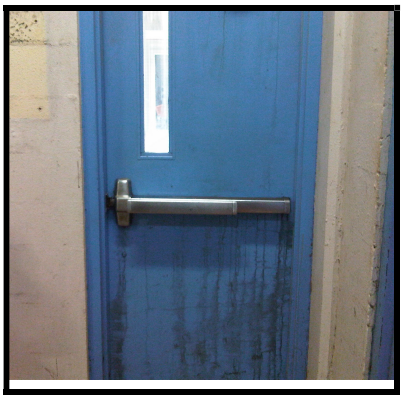

Image 31: Fire Door

Portable Fire Extinguishers

Portable fire extinguishers are located throughout the building. Extinguishers are intended to be the first line of defense in containing and controlling a fire. Refer to Images 32 and 33.

Image 32: Type ABC Portable Fire Extinguisher

Image 33: Type CO_2 Portable Fire Extinguisher

Emergency Lighting

The Building's emergency power supply provides power to a number of light fixtures throughout the facility in event of a power failure. Additional emergency lighting units are also provided with their own battery packs.

Exit Signs

Illuminated exit signs are located throughout the facility to initiate to indicate the exits. Refer to Image 34.

Image 34: Illuminated Exit Sign

Elevator

Automatic recall is provided for the elevator in the administration area to return to the Main Level upon activation of the fire alarm. This is to provide access for the Fire Service upon arrival.

Posted Signage

Signs are posted throughout the building that includes emergency instructions for staff and visitors and graphics that depict the locations of exit routes and exits. Refer to Image 35.

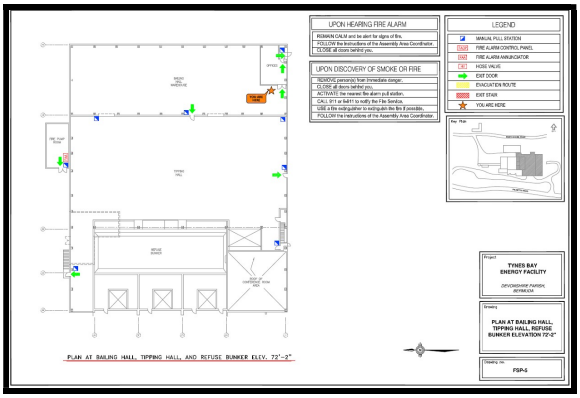

Image 35: Posted Signage

Smoke Evacuation System

A smoke evacuation system is provided for the Tipping Hall and Refuse Pit area. The system is manually activated by switches located at the fire alarm control panel in the Control Room.

Section B

Fire Safety Maintenance Schedule

Fire Safety Maintenance Schedule

The following list outlines the inspections and tests required by the 2003 International Fire Code. The first two pages describe the degree of maintenance required by a check, inspection or test, as well as what skills are necessary to perform that level of maintenance. The following pages constitute the bulk of this section: the maintenance requirements themselves. These include code references and requisite skill levels, and are grouped by frequency interval. Maintenance drawings indicating the locations of fire safety equipment and devices are included in this module.

All water-based fire protection systems are to be inspected, tested and maintained according to NFPA 25. This standard is a comprehensive guide to maintaining all water-based systems and should be used as a reference.

The relevant requirements included in this maintenance manual are the basic maintenance tasks. NFPA 25 is a more comprehensive guide that includes, but is not limited to; instruction on basic repairs, detailed procedures for inspections, and explanations of maintenance tasks. It is recommended that each facility have access to this document.

Note: The inspections and tests detailed in this document are based on the following documents:

- **2018 International Fire Code (IFC).**
- **NFPA 10 "*Standard for Portable Fire Extinguishers*" (2019 Edition).**
- **NFPA 13 "*Standard for the Installation of Sprinkler Systems*" (2019 Edition).**
- **NFPA 20 "Standard for the Installation of Stationary Fire Pumps" (2019 Edition).**
- **NFPA 25 "*Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*" (2020 Edition).**
- **NFPA 72 "*National Fire Alarm Code*" (2011 Edition).**
- **NFPA 110 "*Standard for Emergency and Standby Power Systems*" (2019 Edition).**
- **NFPA 1142 "*Standard on Water Supplies for Suburban and Rural Fire Fighting*" (2007 Edition)**

- **NFPA 1962 "*Standard for the Inspection, Care, and Use of Fire Hose, Couplings, and Nozzles and the Service Testing of Fire Hose*" (2008 Edition).**

- **NFPA 2001 "*Standard on Clean Agent Fire Extinguishing Systems*" (2008 Edition).**

Maintenance Level

For the purpose of carrying out maintenance procedures, the following definitions should be considered applicable:

- ✪ **INSPECT** means physical examination to determine that the device or system will apparently perform in accordance with its intended function, to inspect a device does not require its operation; and

- ✪ **TEST** means operation of device or system to ensure that it will perform in accordance with its intended function.

Note: Notify the Tynes Bay Energy Facility, Maintenance Director, of all interruptions in any fire protection system to take place for a period of greater than 2 hours.

Fire Safety System Impairment Procedures

Impairment procedures must be established in the event that a building fire protection system is shut down or inoperative for a period of time. These procedures will cover preplanned and emergency impairments and are to be authorized by the Emergency Response Leader.

Water Based Systems

Before authorizing any preplanned impairments, the Emergency Response Leader is responsible for verifying that the following procedures have been implemented:

- The extent and expected duration of the impairment have been determined.

- The areas involved have been inspected and the increased risks determined.

- Recommendations have been submitted to management or building owner/manager. Where a required fire protection system is out of service for more than **ten hours** in a 24 hour period, the Emergency Response Leader shall arrange for one or more of the following as required:
  - An approved fire watch.
  - Establishment of a temporary water supply.
  - Establishment and implementation of an approved program to eliminate potential ignition sources and limit the amount of fuel available to the fire.

- The fire service and central monitoring station have been notified.

- The insurance carrier (as necessary), building owner/manager and the Bermuda Fire Service have been notified.

- A tag impairment system has been implemented (Red Tag Permit).

- All necessary tools and materials have been assembled on the impairment site.

- Recommendations have been submitted to the building owner.

Emergency impairments of fire protection systems are typically system leakage, interruption of water supply, ruptured piping, and equipment failure. When an emergency impairment such as these occurs, emergency action shall be taken to minimize potential injury and damage.

Once all impaired equipment is restored to normal working order, the Emergency Response Leader shall verify that the following procedures have been implemented:

- Any necessary inspections and tests have been conducted to verify that affected systems are operational.
- The Fire Service and central station monitoring service been advised that protection has been restored.
- The impairment tag has been removed.

Note: The Emergency Response Leader is responsible for notifying the Bermuda Fire Service within 48 hours of sprinkler system activation.

Skill Categories

Skill categories have been established to identify the skills and knowledge deemed appropriate to perform the **Inspection** and **Test** duties required by the 2003 International Fire Code. Note that a higher skill number does not necessarily incorporate the training and experience required for a lower skill number.

Level 1 – A Tynes Bay Energy Facility employee or representative of the Tynes Bay Energy Facility who has the ability to conduct daily/routine observations.

Level 2 – A Tynes Bay Energy Facility employee or representative of the Tynes Bay Energy Facility who has the knowledge, skill and experience to conduct inspections, checks and minor repairs.

Level 3 – A Tynes Bay Energy Facility employee or a representative of the Tynes Bay Energy Facility who has the training, knowledge, skill, and experience to conduct inspections, checks and repairs.

Level 4 – A Tynes Bay Energy Facility employee or a representative of the Tynes Bay Energy Facility who has Official certification in their discipline, to conduct inspections, checks, and repairs.

Level 5 – This individual is usually a representative of a company engaged in the servicing and maintenance of specific fire protection systems including sprinkler systems, fire alarm systems, elevators, clean agent systems, etc. This skill level includes licensed individuals.

B.1 Daily Inspect and Test Items

B.1.1 Daily Inspect and Test Item Requirements – Skill Level 1 or 2

B.1.1.1 Fire Alarm System

Item	Requirement	Code Reference	Skill Level
1.	Fire Alarm System – Visually **inspect** the fire alarm panel to ensure that the AC power lamp is illuminated and to determine if there are any trouble signals annunciated. If the AC power lamp is off, press the "lamp test" switch to verify that power is connected. Failure of the lamps to come on indicates that the AC power to the system has been interrupted. Check the fire alarm system AC breaker or call your supervisor. If any lamps besides the AC power on lamp are illuminated, note the lamp description and advise your supervisor immediately.	NFPA 72 10.3.1	1

Note: All Items under B.1.1.1 will be done on a daily basis, but will only be recorded on the appropriate charts in the fire safety systems maintenance log on a weekly basis by the Maintenance Supervisor. These items are to be checked off at the end of each week.

B.1.1.2 Standpipes

Item	Requirement	Code Reference	Skill Level
1.	Standpipe – If, in the course of routine daily operations, hose stations or cabinets are found by maintenance staff to have a noticeable deficiency, maintenance staff shall notify their supervisor that corrective action is required.	NFPA 25 6.1	1

Note: All Items under B.1.1.2 will be done on a daily basis, but will only be recorded on the appropriate charts in the fire safety systems maintenance log on a weekly basis by the Maintenance Supervisor. These items are to be checked off at the end of each week.

B.1.1.3 Private Fire Hydrants

Item	Requirement	Code Reference	Skill Level
1.	Hydrant Maintenance – Hydrants shall be maintained in operating condition.	IFC 508.5.2	2

Note: All Items under B.1.1.3 will be done on a daily basis, but will only be recorded on the appropriate charts in the fire safety systems maintenance log on a weekly basis by the Maintenance Supervisor. These items are to be checked off at the end of each week.

B.1.1 Daily Inspect and Test Item Requirements – Skill Level 1 or 2 (Cont'd)

B.1.1.4 Fire Service Access

Item	Requirement	Code Reference	Skill Level
1.	Fire Service Access – **Inspect** driveways to ensure they are accessible for emergency vehicles at all times. Signs shall be posted to prohibit the parking of vehicles that might obstruct fire department access.	IFC 503.3	1

Note: All Items under B.1.1.4 will be done on a daily basis, but will only be recorded on the appropriate charts in the fire safety systems maintenance log on a weekly basis by the Maintenance Supervisor. These items are to be checked off at the end of each week.

B.1.1.5 Egress Systems Applying to Corridors and Access to Exits

Item	Requirement	Code Reference	Skill Level
1.	Doors in Fire Separations – **Inspect** doors in fire separations to ensure that they remain closed unless the door is equipped with an approved hold open device.	IFC 703.1	1
2.	Exit Lighting and Exit Signs – **Inspect** exit lights and exit signs to ensure they are illuminated during times the building is occupied.	IFC 1011.1	1

Note: All Items under B.1.1.5 will be done on a daily basis, but will only be recorded on the appropriate charts in the fire safety systems maintenance log on a weekly basis by the Maintenance Supervisor. These items are to be checked off at the end of each week.

B.2 Weekly Inspect and Test Items

B.2.1 Weekly Inspect and Test Items Requiring Skill Level 3

B.2.1.1 Electric Fire Pumps

Item	Requirement	Code Reference	Skill Level
1.	Electric Fire Pumps – **Inspect** to confirm the following:	NPFA 25 8.2.2	3
	a) Pump System Conditions: • Pump suction and discharge and by-pass valves are fully open. • Piping is free of leaks. • Suction line pressure gauge reading is normal. • System line pressure gauge reading is normal. • Suction reservoir is full. • Wet pit suction screens (if applicable) are unobstructed and in place.		
	b) Electrical System Conditions: • Controller pilot light (power on) is illuminated. • Transfer switch normal pilot light is illuminated. • Isolating switch is closed – standby (emergency) source. • Reverse phase alarm pilot light is off or normal phase rotation pilot light is on. • Oil level in vertical motor sight glass is normal.		
2.	**Test** the electric fire pump by starting the pump automatically. The pump shall be run for a minimum of 10 minutes. The automatic weekly test timer can be substituted for the starting procedure where provided. During testing complete the following:	NPFA 25 8.3.2	
	a) Pump System Conditions: • Record the system suction and discharge pressure gauge readings. • Check the pump packing glands for slight discharge. • Adjust gland nuts if necessary. • Check for unusual noise or vibration. • Check packing boxes, bearings, or pump casing for overheating. • Record the pump starting pressure.		

B.2.1 Weekly Inspect and Test Item Requirements – Skill Level 3 (Cont'd)

B.2.1.1 Electric Fire Pumps (Cont'd)

Item		Requirement	Code Reference	Skill Level
2.	b)	Electrical System Conditions: • Observe the time for motor to accelerate to full speed. • Record the time controller is on first step (for reduced voltage or reduced current starting). • Record the time pump runs after starting (for automatic stop controllers).		

Note 1: All tests and inspections for items B.2.1.1 shall be recorded by the Maintenance Supervisor or building maintenance personnel on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

Note 2: The manufacturer's recommendations for preventative maintenance shall be followed. If abnormalities are found, shut the fire pump off and contact your supervisor immediately to have technical personnel, as certified by the pump manufacturer, service the fire pump.

B.2.1 Weekly Inspect and Test Item Requirements – Skill Level 3 (Cont'd)

B.2.1.2 Diesel Fire Pumps

Item	Requirement	Code Reference	Skill Level
1.	Diesel Fire Pumps – **Inspect** pump room temperature to ensure that the ambient temperature in the pump room never falls below the minimum recommended by the engine manufacturer or 4°C, whichever is higher. **Inspect** to confirm the following: a) Pump House/Room Conditions. ● Ventilating louvers are free to operate. b) Pump System Conditions: ● Pump suction and discharge and by-pass valves are fully open. ● Piping is free of leaks. ● Suction line pressure gauge reading is normal. ● System line pressure gauge reading is normal. ● Suction reservoir is full. ● Wet pit suction screens (if applicable) are unobstructed and in place. c) Diesel System Conditions: ● Fuel tank is two-thirds full. ● Controller selector switch is in auto position. ● Batteries' (2) voltage readings are normal.	NPFA 25 8.2.2	2

B.2.1 Weekly Inspect and Test Item Requirements – Skill Level 3 (Cont'd)

B.2.1.2 Diesel Fire Pumps (Cont'd)

Item	Requirement	Code Reference	Skill Level
2.	**Test** the diesel fire pump by starting the pump automatically. The pump shall be run for a minimum of 30 minutes. The automatic weekly test timer can be substituted for the starting procedure where provided. During testing complete the following: a) Pump System Conditions: • Record the system suction and discharge pressure gauge readings. • Check the pump packing glands for slight discharge. • Adjust gland nuts if necessary. • Check for unusual noise or vibration. • Check packing boxes, bearings, or pump casing for overheating. • Record the pump starting pressure. b) Diesel Engine System Conditions: • Observe the time for engine to crank. • Observe the time for engine to reach running speed. • Observe the engine oil pressure gauge, speed indicator, water, and oil temperature indicators periodically while engine is running. • Record any abnormalities. • Check the heat exchanger for cooling water flow. c) Pump System Conditions: • Record the system suction and discharge pressure gauge readings. • Check the pump packing glands for slight discharge. • Adjust gland nuts if necessary. • Check for unusual noise or vibration. • Check packing boxes, bearings, or pump casing for overheating. • Record the pump starting pressure.	NPFA 25 8.3.2	2

B.2.1 Weekly Inspect and Test Items Requiring Skill Level 3 (Cont'd)

B.2.1.2 Diesel Fire Pumps (Cont'd)

Item	Requirement	Code Reference	Skill Level
2.	**Test** the diesel fire pump by starting the pump automatically. The pump shall be run for a minimum of 30 minutes. The automatic weekly test timer can be substituted for the starting procedure where provided. During testing complete the following: d) Diesel Engine System Conditions: • Observe the time for engine to crank. • Observe the time for engine to reach running speed. • Observe the engine oil pressure gauge, speed indicator, water, and oil temperature indicators periodically while engine is running. • Record any abnormalities. • Check the heat exchanger for cooling water flow.	NPFA 25 8.3.2	2

Note 1: All tests and inspections for items B.2.1.2 shall be recorded by the Maintenance Supervisor or building maintenance personnel on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

Note 2: The manufacturer's recommendations for preventative maintenance shall be followed. If abnormalities are found, shut the fire pump off and contact your supervisor immediately to have technical personnel, as certified by the pump manufacturer, service the fire pump.

B.2.1 Weekly Inspect and Test Items Requiring Skill Level 3 (Cont'd)

B.2.1.3 Sprinkler Systems

Item	Requirement	Code Reference	Skill Level
1.	Preaction/Deluge System Sprinkler Gauges – The dry-pipe sprinkler gauge shall be **inspected** weekly to ensure that normal air and water pressures are being maintained.	NFPA 25 5.2.4.2	3
2.	Preaction and Deluge Valves – **Inspect** valve enclosures equipped with low temperature alarms weekly.	NFPA 25 13.4.3.1.1	3

Note 1: All tests and inspections for item B.2.1.3 shall be recorded by the Maintenance Supervisor or other person(s) designated by the Maintenance Supervisor on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

Note 2: If it is noted that the priming water level in the preaction/deluge pipe valve is below normal, contact your supervisor immediately.

B.3 Monthly Inspect and Test Items

B.3.1 Monthly Inspect and Test Items Requiring Skill Level 1 or 2

B.3.1.1 Fire Alarm System

Item	Requirement	Code Reference	Skill Level
1.	Fire Alarm - **Test** the following components of the fire alarm system and take appropriate corrective measures if required. a) On a rotational basis, one fire alarm manual pull station device in the building shall be operated and shall initiate a fire alarm condition. b) The intended function of all alarm audible and visual signal appliances shall be ensured. c) The annunciator panel shall be checked to ensure that the tested devices are annunciated correctly. Where any of the above tests do not provide their designed function, contact your supervisor immediately. After the test, ensure that the system is reset and that only the "POWER ON" indicator is illuminated. Note: If this test is not part of a fire drill, ensure that the building occupants have been notified that an alarm signal will sound. Notify the Fire Department and/or the Central Station monitoring the fire alarm system (if applicable). Also, when the test is complete, notify above parties that the test is over.	NFPA 72 10.3.1	1

Note: All tests and inspections for item B.3.1.1 shall be recorded by the Maintenance Supervisor or building maintenance personnel on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.3.1 Monthly Inspect and Test Items Requiring Skill Level 1 or 2 (Cont'd)

B.3.1.2 Egress Systems Applying to Corridors and Access to Exits

Item	Requirement	Code Reference	Skill Level
1.	Self-Contained Emergency Lighting – All self-contained emergency lighting units shall be **inspected** to ensure that pilot lights are functioning and that terminal connections are clean and tight. **Test** the units to ensure that they will function upon failure of the primary power source.	IFC 604.5	2

Note: All tests and inspections for item B.3.1.2 shall be recorded by the Maintenance Supervisor or building maintenance personnel on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.3.1.3 Portable Fire Extinguishers

Item	Requirement	Code Reference	Skill Level
1.	Portable Fire Extinguishers – **Inspect** all fire extinguishers to ensure that the fire extinguisher has not been tampered with, is not damaged, missing, impaired, leaking, undercharged or overcharged, or has obvious corrosion. If the extinguisher appears defective, replace it immediately or the supervisor shall be notified that corrective action is required.	NFPA 10 7.2.2	1

Note: All tests and inspections for item B.3.1.3 shall be recorded by the Maintenance Supervisor or building maintenance personnel on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.3.1 Monthly Inspect and Test Items Requiring Skill Level 1 or 2 (Cont'd)

B.3.1.4 Water Storage Tanks

Item	Requirement	Code Reference	Skill Level
1.	Inspection of Water Storage Tanks – Tanks shall be **inspected** at intervals not greater than one month during which: a) The water level shall be observed, and b) Water levels storage tanks shall be maintained at the specified levels.	NFPA 25 9.2.1	1

Note 1: All tests and inspections for item B.3.1.4 shall be recorded by the Maintenance Supervisor or building maintenance personnel on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

Note 2: Tanks equipped with supervised water level alarms connected to a constantly attended location shall be permitted to be inspected quarterly.

B.3.2 Monthly Inspect and Test Items Requiring Skill Level 3

B.3.2.1 Egress Systems Applying to Corridors and Access to Exits

Item	Requirement	Code Reference	Skill Level
1.	Doors in Fire Separations - **Test** all door hardware including latches, hinges, door closers, etc. Ensure that they operate properly while manually opening and closing the door. When opened, ensure that they return to their closed position and latch. If door closers, latches or hinges do not operate properly, take corrective action or advise your supervisor that this work is necessary.	IFC 703.1	3

Note: All tests and inspections for item B.3.2.1 shall be recorded by the Maintenance Supervisor or building maintenance personnel on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.3.2 Monthly Inspect and Test Items Requiring Skill Level 3

B.3.2.2 Sprinkler Systems

Item	Requirement	Code Reference	Skill Level
1.	Wet Pipe System Sprinkler Gauges – The wet pipe sprinkler gauge shall be **inspected** weekly to ensure that normal air and water pressures are being maintained.	NFPA 25 5.2.4.1	3
2.	Locked and Supervised Sprinkler System Control Valves – **Inspect** control valves monthly, which are locked open or supervised to verify that they are: a) In the normal open or closed position. b) Properly sealed, locked, or supervised. c) Accessible. d) Provided with appropriate wrenches. e) Free from external leaks. f) Provided with appropriate identification.	NFPA 25 13.3.2.1.1	3
3.	Sprinkler System Alarm Valves – Alarm valves should be **inspected** monthly **t**o verify that: a) The gauges indicate normal supply water pressure is being maintained. b) The valve is free of physical damage. c) All valves are in the appropriate open or closed position. d) The retarding chamber or alarm drains are not leaking.	NFPA 25 13.4.1.1	3

B.3.2 Monthly Inspect and Test Items Requiring Skill Level 3 (Cont'd)

B.3.2.2 Sprinkler Systems (Cont'd)

Item	Requirement	Code Reference	Skill Level
4.	Preaction/Deluge Valves – Preaction/deluge valves shall be **inspected** monthly to verify that: a) The valve is free of physical damage. b) All trim valves are in the appropriate open or closed position. c) The valve seat is not leaking. d) Electrical components are in service.	NFPA 25 13.4.3.1.6	3
5.	Wet Pipe Sprinkler System Gauges – The wet-pipe sprinkler gauge shall be **inspected** monthly to ensure that normal air and water pressures are being maintained.	NFPA 25 5.2.4	3

B.4 Quarterly Inspect and Test Items

B.4.1 Quarterly Inspect and Test Items Requiring Skill Level 1 or 2

B.4.1.1 Standpipes

Item	Requirement	Code Reference	Skill Level
1.	Hose Stations and Cabinets – **Inspect** hose stations, piping, and cabinets to ensure that all of the equipment is in place and in operable condition.	NFPA 1962	1
2.	Hose valves – **Inspect** hose valves to verify the following: a) Hose caps are in place and not damaged b) Hose threads shall be inspected for damage. c) Gaskets shall be inspected for damage or deterioration. d) Hose valves shall be inspected for leaks. e) Hose valves shall be inspected to ensure no obstructions are present. f) Hose valves shall be inspected to ensure that restricting devices are present.	NFPA 25 13.5.6	1

Note: All tests and inspections for item B.4.1.1 shall be recorded by the Maintenance Supervisor or building maintenance personnel on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.4.1 Quarterly Inspect and Test Items Requiring Skill Level 1 or 2 (Cont'd)

B.4.1.2 Dry Hydrants

Item	Requirement	Code Reference	Skill Level
1.	Dry Hydrants – **Inspect** dry hydrants to verify that they are in good operating condition following:	NFPA 1142 8.7.1	1
2.	Thorough survey shall be conducted to reveal any deterioration in the water supply in ponds, streams or cisterns.	NFPA 1142 8.7.2	1
3.	Vegetation shall be cleared for a minimum of 3 ft (0.9 m) radius around the hydrant.	NFPA 1142 8.7.3	1
4.	Hydrants shall be painted, as required, with reflective material to enhance their visibility during emergencies.	NFPA 1142 8.7.4	1

Note: All tests and inspections for item B.4.1.2 shall be recorded by the Maintenance Supervisor or building maintenance personnel on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.4.2 Quarterly Inspect and Test Items Requiring Skill Level 3

B.4.2.1 Sprinkler Systems

Item	Requirement	Code Reference	Skill Level
1.	Hydraulic Nameplate – **Inspect** hydraulic nameplate to ensure that is affixed to the sprinkler riser and is legible.	NFPA 25 5.2.7	3
2.	Sprinkler System Alarm Devices – **Inspect** alarm devices quarterly to confirm that they are free from physical damage.	NFPA 25 5.2.6	3

Note: All tests and inspections for item B.4.2.1 shall be recorded by the Maintenance Supervisor or other person(s) designated by the Maintenance Supervisor on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.4.2 Quarterly Inspect and Test Items Requiring Skill Level 3 (Cont'd)

B.4.2.2 Siamese Connection

Item	Requirement	Code Reference	Skill Level
1.	Siamese Connection – Siamese connections shall be **inspected** quarterly in order to verify the following:	NFPA 25 13.7.1	3
	a) The siamese connections are visible and accessible.		
	b) Couplings or swivels are not damaged and rotate smoothly.		
	c) Plugs or caps are in place and undamaged. If caps are not in place **inspect** for obstructions.		
	d) Gaskets are in place and in good condition.		
	e) Identification signs are in place.		
	f) The check valve is not leaking.		
	g) The automatic drain valve is in place and operating properly.		
	h) The siamese connection clapper(s) is in place and operating properly.		
	i) Components shall be repaired or replaced as necessary in accordance with the manufacturer's instructions. Any obstructions that are present shall be removed.		

Note: All tests and inspections for item B.4.2.2 shall be recorded by the Maintenance Supervisor or building maintenance personnel on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.4.3 Quarterly Inspect and Test Items Requiring Skill Level 5

B.4.3.1 Sprinkler Systems

Item	Requirement	Code Reference	Skill Level
1.	Low Air Pressure Alarm – Low air pressure alarms, if provided, shall be tested quarterly in accordance with the manufacturer's instructions.	NFPA 25 13.4.4.2.6 13.4.3.2.10	5
2.	Pre-action Pipe – Priming water level shall be tested quarterly form compliance with manufacturer's instructions.	NFPA 25 13.4.3.2.1 13.4.4.2.1	5
3.	Mechanical Waterflow Devices – Test quarterly (include but not limited to water motor gongs).	NFPA 25 5.3.3 13.2.6.1	5

Note: All tests and inspections for item B.4.3.1 shall be recorded by the Contractor or other person(s) designated by the Maintenance Supervisor on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.5 Semi-Annual Inspect and Test Items

B.5.1 Semi-Annual Inspect and Test Items Requiring Skill Level 3

B.5.1.1 Clean Agent Extinguishing System

Item	Requirement	Code Reference	Skill Level
1.	Clean Agent Extinguishing System – Agent quantity and pressure of refillable containers shall be checked.	NFPA 2001 7.1.3	3

Note 1: All tests and inspections for item B.5.1.1 shall be recorded by the Maintenance Supervisor or building maintenance personnel on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

Note 2: FM 200, Inergen, Novec 1230, etc. are all clean agent systems.

B.5.2 Semi-Annual Inspect and Test Items Requiring Skill Level 5

B.5.2.1 Sprinkler Systems

Item	Requirement	Code Reference	Skill Level
1.	Supervisory Switches – Each control valve device shall be **tested** semiannually (Refer to NFPA 25).	NFPA 25 13.3.3.5	5

Note: All tests and inspections for item B.5.2.1 shall be recorded by the Contractor or other person(s) designated by the Maintenance Supervisor on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.5.2.2 Water Storage Tanks

Item	Requirement	Code Reference	Skill Level
1.	Water Storage Tanks – Water level alarms shall be **tested** semiannually (Refer to NFPA 25).	NFPA 25 9.3.5	5

Note: All tests and inspections for item B.5.2.2 shall be recorded by the Contractor or other person(s) designated by the Maintenance Supervisor on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.6 Annual Inspect and Test Items

B.6.1 Annual Inspect and Test Items Requiring Skill Level 3

6.1.1 Heating, Ventilating, and Air-Conditioning Systems

Item	Requirement	Code Reference	Skill Level
1.	Mechanical Air-Conditioning and Ventilating Systems – Disconnect switches for mechanical air-conditioning and ventilating systems should be operated to establish that the system can be shut down in an emergency. This should be carried out at the same time as the yearly sprinkler and fire alarm inspections are completed. This will provide an opportunity to test the operation of these fire safety components together as a system to confirm their proper operation.	IFC 909.21	3

Note: All tests and inspections for item B.6.1.1 shall be recorded by the Maintenance Supervisor or building maintenance personnel on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.6.2 Annual Inspect and Test Items Requiring Skill Level 4 or 5

B.6.2.1 Egress Systems Applying to Corridors and Access to Exits

Item	Requirement	Code Reference	Skill Level
1.	Self-Contained Emergency Lighting – All self-contained emergency lighting unit equipment should be **tested** to ensure the unit will provide emergency lighting for a duration equal to the design criterion under simulated power failure conditions (30 minutes). Remove electrical power to the emergency lighting unit for 30 minutes to determine if emergency lighting is provided. After completion of the test, the charging conditions for voltage and current and the recovery period shall be tested to ensure that the charging system is functioning in accordance with the manufacturer's specifications. If, after completion of the test, it is determined that the charging system is not functioning in accordance with the manufacturer's specifications, notify your supervisory immediately.	IFC 604.5	5

Note: All tests and inspections for item B.6.2.1 shall be recorded by the Maintenance Supervisor or building maintenance personnel on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.6.2 Annual Inspect and Test Items Requiring Skill Level 4 or 5 (Cont'd)

B.6.2.2 Fire Alarm System

Item	Requirement	Code Reference	Skill Level
1.	Fire Alarm System - The fire alarm shall be **tested** in accordance with NFPA 72, "*National Fire Alarm Code"* 2007 Edition.	IFC 907.20.5	5

Note: All tests and inspections for item B.6.2.2 shall be recorded by the Maintenance Supervisor or building maintenance personnel on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.6.2.3 Portable Fire Extinguishers

Item	Requirement	Code Reference	Skill Level
1.	Maintenance – Fire extinguishers should be subjected to maintenance by trained personnel at intervals not more than one year apart.	NFPA 10	5

Note: All tests and inspections for item B.6.2.3 shall be recorded by the Contractor or other person(s) designated by the Maintenance Supervisor on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.6.2.4 Sprinkler Systems

Item	Requirement	Code Reference	Skill Level
1.	Preaction/Deluge Valves		5
	a) Preaction/Deluge valves shall be trip **tested** with the control valve partially open. Refer to NFPA 25.	NFPA 25 13.4.4.1.5 13.4.4.2.2	
	b) The interior of the preaction/deluge valve shall be **inspected** annually when the trip test is conducted.	13.4.3.1.7	

Note: Before conducting this test, ensure that the building occupants have been notified that an alarm signal may sound. Also notify the fire department and/or the Central Station monitoring the fire alarm system before and after the test.

B.6.2 Annual Inspect and Test Items Requiring Skill Level 4 or 5 (Cont'd)

B.6.2.4 Sprinkler Systems (Cont'd)

2.	Preaction/Deluge Valves		5
	a) Preaction/deluge valves shall be trip **tested** with the control valve open. Refer to NFPA 25.	NFPA 25 13.4.3.2.2	
	b) The interior of the preaction/deluge valves and condition of the detection devices shall be **inspected** annually when the trip test is conducted.		
	Note 1: Before conducting this test, ensure that the building occupants have been notified that an alarm signal may sound. Also notify the fire service and/or the Central Station monitoring the fire alarm system before and after the test.		
3.	Sprinkler Heads – **Inspect** sprinkler heads to ensure that they are free from damage, corrosion, grease, paint, or whitewash and replace where necessary as a result of such conditions. Replace any damaged heads.	NFPA 25 5.2.1	5
4.	Sprinkler Heads – **Inspect** sprinkler head cabinet to ensure that the required number of spare heads is present for each type of head, and that the appropriate wrenches are available.	NFPA 25 5.2.1	5
5.	Sprinkler System Pipe and Fittings – Sprinkler piping and fittings shall be **inspected** from floor level (Refer to NFPA 25). Note: Piping and hangers located within concealed ceiling spaces do not require inspection.	NFPA 25 5.2.2 5.2.3	5
6.	Control Valves – Each control valve shall be operated annually through its full range and returned to its normal position (Refer to NFPA 25).	NFPA 25 13.3.3.1	5
7.	Water Supply – Test the sprinkler water supply annually by performing a main drain test.	NFPA 25 13.2.5	5

Note: All tests and inspections for item B.6.2.4 shall be recorded by the Contractor or other person(s) designated by the Maintenance Supervisor on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.6.2 Annual Inspect and Test Items Requiring Skill Level 4 or 5 (Cont'd)

B.6.2.5 Fire Pumps

Item	Requirement	Code Reference	Skill Level
1.	Fire Pumps – **Test** fire pumps at full rated capacity at intervals not greater than 12 months to ensure that they are capable of delivering the rated flow (Refer to NFPA 25).	NFPA 25 8.3.3.1	5

Note 1: All tests and inspections for item B.6.2.5 shall be recorded by the Contractor or other person(s) designated by the Maintenance Supervisor on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

Note 2: The manufacturer's recommendations for preventative maintenance shall be followed. If abnormalities are found, shut the fire pump off and contact your supervisor immediately to have technical personnel, as certified by the pump manufacturer, service the fire pump.

B.6.2.6 Standpipes

Item	Requirement	Code Reference	Skill Level
1.	Hose Stations and Cabinets – **Inspect** hose cabinets to ensure that all of the equipment is in place and in operable condition. **Inspect** all hose connections in accordance with NFPA 25 Table 6.2.2.	NFPA 25 NFPA 1962	5

Note: All tests and inspections for item B.6.2.6 shall be recorded by the Contractor or other person(s) designated by the Maintenance Supervisor on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.6.2.7 Private Fire Hydrants

Item	Requirement	Code Reference	Skill Level
1.	Hydrant Inspections and Repairs – **Inspect** hydrant and correct as per Table 7.2.2.5 in NFPA 25.	NFPA 25 7.2.2.5	5
2.	Hydrant Inspection Frequency – Hydrants shall be flushed at intervals not greater than 12 months (Refer to NFPA 25).	NFPA 25 7.3.2	5

Note: All tests and inspections for item B.6.2.7 shall be recorded by the Contractor or other person(s) designated by the Maintenance Supervisor on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.6.2 Annual Inspect and Test Items Requiring Skill Level 4 or 5 (Cont'd)

B.6.2.8 Elevators

Item	Requirement	Code Reference	Skill Level
1.	Elevators – Elevators supplied with emergency power shall be **Tested** under 100% emergency power to ensure operation in conformance with ASME A17.1, *"Safety Code for Elevators"* shall be performed on: a) In-car emergency service switches. b) Manual key-operated recall switches located outside an elevator shaft. c) Automatic emergency recall systems.	IFC 607.1	5

Note: All tests and inspections for item B.6.2.8 shall be recorded by the Contractor or other person(s) designated by the Maintenance Supervisor on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.6.2.9 Clean Agent Extinguishment Systems

Item	Requirement	Code Reference	Skill Level
1.	Clean Agent Systems – All systems shall be thoroughly **inspected** and **tested** in accordance with manufacturer's written maintenance instructions (preferably by the manufacturer of the equipment being inspected and serviced).	NFPA 2001	5
2.	Enclosure – **Inspect** enclosure area for new penetrations that may adversely affect leakage or change the volume of hazard. Where inspection indicates conditions that could result in the inability to maintain the clean agent concentration, the conditions shall be corrected. If uncertainty still exits the enclosures shall be rested for integrity.	NFPA 2001	5

Note 1: All tests and inspections for item B.6.2.9 shall be recorded by the Contractor or other person(s) designated by the Maintenance Supervisor on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

Note 2: FM 200, Inergen, Novec 1230, etc. are all clean agent systems.

B.6.2 Annual Inspect and Test Items Requiring Skill Level 4 or 5 (Cont'd)

B.6.2.10 Dry Hydrants

Item	Requirement	Code Reference	Skill Level
1.	Dry Hydrants – Shall be flow tested with a fire service pump to endure the minimum design flow is maintained.	NFPA 1142	5

Note: All tests and inspections for item B.6.2.10 shall be recorded by the Maintenance Supervisor or building maintenance personnel on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.7 Multi-Year Inspections and Tests

B.7.1 Three (3) Year Inspect and Test Items Requiring Skill Level 4 or 5

B.7.1.1 Water Storage Tanks

Item	Requirement	Code Reference	Skill Level
1.	Sediment Accumulation and Corrosion – Tanks shall be **inspected** at intervals not greater than 3 years for sediment accumulations and for corrosion. Accumulations of sediment found during inspections shall be removed.	NFPA 25 9.2.6	5

Note 1: All tests and inspections for item B.7.1.1 shall be recorded by the Contractor or other person(s) designated by the Maintenance Supervisor on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

Note 2: Requirements for multi-year testing for such items as level indicators and gauges are not addressed in the fire safety systems maintenance information documents. The sprinkler system service contractor shall review the applicable NFPA 25 requirements to ensure compliance.

B.7.2 Five (5) Year Inspect and Test Items Requiring Skill Level 4 or 5

B.7.2.1 Clean Agent Fire Extinguishing Systems

Item	Requirement	Code Reference	Skill Level
1.	Clean Agent Systems – All hose shall be **tested** every 5 years.	NFPA 2001	5
2.	Clean Agent Systems – Cylinders in continuous service without discharging we be given a complete visual inspection in conformance with CGA C-6, "*Standard for Visual Inspection of Steel Compressed Gas Cylinders",* except that tanks need not be emptied or stamped while under pressure. Inspection results should be recorded by means of a record tag affixed to each cylinder and a suitable inspection report.	NFPA 2001	5

Note: All tests and inspections for item B.7.2.1 shall be recorded by the Contractor or other person(s) designated by the Maintenance Supervisor on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.7.2 Five (5) Year Inspect and Test Items Requiring Skill Level 4 or 5 (Cont'd)

B.7.2.2 Standpipes

Item	Requirement	Code Reference	Skill Level
1.	Standpipe Systems Flow Testing – Standpipe systems shall be flow **tested** at intervals not greater than 5 years to ensure that the design flow can be delivered (Refer to NFPA 25). If during the flow test required above, there is any indication of the presence of debris in the piping, the entire system shall be flushed of foreign material.	NFPA 25 6.3.1	5
2.	Standpipe Systems Hydrostatic Test – Hydrostatic **tests** shall be conducted every 5 years on dry standpipe systems and dry portions of wet standpipe systems (Refer to NFPA 25).	NFPA 25 6.3.2	5

Note: All tests and inspections for item B.7.2.2 shall be recorded by the Contractor or other person(s) designated by the Maintenance Supervisor on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

B.7.2.3 Sprinkler Systems

Item	Requirement	Code Reference	Skill Level
1.	Obstructions – An **inspection** of piping and branch line conditions shall be conducted every 5 years (Refer to NFPA 25).	NFPA 25 13.2.1	5
2.	Alarm Valves – Preaction/Deluge system strainers, filters, and restriction orifices shall be **inspected** internally every 5 years unless tests indicate a greater frequency is necessary	NFPA 25 13.4.1.2 13.4.3.1.8 13.4.4.1.6	5
3..	Check Valves – Check Valves shall be **inspected** internally every 5 years to verify that all components operate correctly, move freely, and are in good condition.	NFPA 25 13.4.2.1	5

B.7.2 Five (5) Year Inspect and Test Items Requiring Skill Level 4 or 5 (Cont'd)

B.7.2.3 Sprinkler Systems (Cont'd)

Item	Requirement	Code Reference	Skill Level
4.	Gauges – Gauges shall be replaced every 5 years or **tested** every 5 years by comparison with a calibrated gauge. Gauges not accurate to within 3 percent of the full scale shall be recalibrated or replaced.	NFPA 25 5.3.2	5

Note 1: All tests and inspections for item B.7.2.3 shall be recorded by the Contractor or other person(s) designated by the Maintenance Supervisor on the appropriate charts in the fire safety systems maintenance log upon completion of the tasks.

Note 2: Requirements for multi-year testing for such items as sprinklers and gauges are not addressed in the fire safety systems maintenance information documents. The sprinkler system service contractor shall review the applicable NFPA 25 requirements to ensure compliance.

Appendix A

Fire Safety Systems Maintenance Log

To be kept in Building Administrators Office

Tynes Bay Energy Facility, 2008
RJ Bartlett Engineering Ltd

Book No. ___ of __

Dated from _____ to _____

Note: To prepare a complete yearly logbook print the following:

- **52 copies of each DAILY log sheet.**
- **52 copies of each WEEKLY log sheet.**
- **12 copies of each MONTHLY log sheet.**
- **4 copies of each QUARTERLY log sheet.**
- **2 copies of each SEMIANNUAL log sheet.**
- **1 copy of each ANNUAL log sheet.**
- **1 copy of each MULTI YEAR log sheet.**
- **1 copy of each FIRE EXTINGUISHER INSPECTION sheet.**
- **1 copy of each FIRE DRILL form.**

FIRE SAFETY SYSTEMS
Maintenance Log

This log has been created to reflect the fire safety systems maintenance requirements for the Tynes Bay Energy Facility.

This log shall be maintained and regularly updated, and shall be available for review.

Note: All Fire Safety Systems Maintenance Logs are to be kept on site for a period of at least 5 years.

Book No. _____ of ____ Dated from _____ to _____

Emergency Contact: _____

Cell: _____ Home: _____

After Hours
Emergency Contact: _____

Cell: _____ Home: _____

Non-Emergency Contact: _____

Cell: _____ Home: _____

Fire Safety Systems Maintenance Log

This log has been created to reflect the fire safety systems maintenance requirements for the Tynes Bay Energy Facility.

This log shall be maintained and regularly updated, and shall be available for review.

Note: All Fire Safety Systems Maintenance Logs are to be kept on site for a period of at least 5 years.

For the purpose of carrying out maintenance procedures, the following definitions should be considered applicable.

INSPECT: Means physical examination to determine that the device or system will apparently perform in accordance with its intended function, to inspect a device does not require its operation.

TEST: Means operation of system to ensure that it will perform in accordance with its intended function.

Skill Categories

Skill categories have been established to identify the skills and knowledge deemed appropriate to perform the **Inspect** and **Test** duties required by the 2003 International Fire Code. Note that a higher skill number does not necessarily incorporate the training and experience required for a lower skill number.

Level 1 – A Tynes Bay Energy Facility employee or representative of the Tynes Bay Energy Facility who has the ability to conduct daily/routine observations.

Level 2 – A Tynes Bay Energy Facility employee or representative of the Tynes Bay Energy Facility who has the knowledge, skill, and experience to conduct inspections, checks, and minor repairs.

Level 3 – A Tynes Bay Energy Facility employee or a representative of the Tynes Bay Energy Facility who has the training, knowledge, skill, and experience to conduct inspections, checks, and repairs.

Level 4 – A Tynes Bay Energy Facility employee or a representative of the Tynes Bay Energy Facility who has Official certification in their discipline, to conduct inspections, checks, and repairs.

Level 5 – This individual is usually a representative of a company engaged in the servicing and maintenance of specific fire protection systems including sprinkler systems, fire alarm systems, elevators, clean agent systems, etc. This skill level includes licensed individuals.

Daily Fire Safety Systems Maintenance Duties (Recorded Weekly)

Date: _____ Inspected By: _____

FIRE ALARM SYSTEM B.1.1.1							
AC Lamp Test	Status:		A		B		C
Comments							
STANDPIPES B.1.1.2							
Condition	Status:		A		B		C
Comments							
PRIVATE FIRE HYDRANTS B.1.1.3							
Condition	Status:		A		B		C
Comments							
Readily Accessible	Status:		A		B		C
Comments							

Mark "✓" in the appropriate box to indicate the status of the component as per the following:
☐ A – Done, ☐ B – Deficient, work order generated, ☐ C – Deficiency corrected
For additional comments, please use end of this section.

SIGNATURE: _____

Daily Fire Safety Systems Maintenance Duties (Recorded Weekly) (Cont'd)

Date: _____ Inspected By: _____

FIRE DEPARTMENT ACCESS B.1.1.4							
Access Clear	Status:		A		B		C
Comments							
EGRESS SYSTEMS APPLYING TO CORRIDORS AND ACCESS TO EXITS B.1.1.5							
Doors in Fire Separations	Status:		A		B		C
Comments							
Exit Lights/Exit Signs	Status:		A		B		C
Comments							
FIRE SEPARATIONS B.1.1.6							
Fire Separations	Status:		A		B		C
Comments							

Mark "✓" in the appropriate box to indicate the status of the component as per the following:
☐ A – Done, ☐ B – Deficient, work order generated, ☐ C – Deficiency corrected
For additional comments, please use end of this section.

SIGNATURE: _____

Daily Fire Safety Systems Maintenance Duties – Comments

Daily Fire Safety Systems Maintenance Duties – Comments (Cont'd)

Weekly Fire Safety Systems Maintenance Duties

Date: _____ Inspected By: _____

ELECTRIC FIRE PUMPS B.2.1.1							
Pressure Gauge Readings – Normal	Status:		A		B		C
Comments							
Pipes Free of Leaks	Status:		A		B		C
Comments							
Pump System Conditions – Normal	Status:		A		B		C
Comments							
Electrical System Conditions – Normal	Status:		A		B		C
Comments							

Mark "✓" in the appropriate box to indicate the status of the component as per the following:
☐ A – Done, ☐ B – Deficient, work order generated, ☐ C – Deficiency corrected
For additional comments, please use end of this section.

SIGNATURE: _____

Weekly Fire Safety Systems Maintenance Duties (Cont'd)

Date: _____ Inspected By: _____

DIESEL FIRE PUMPS B.2.1.2							
Pressure Gauge Readings – Normal	Status:		A		B		C
Comments							
Pipes Free of Leaks	Status:		A		B		C
Comments							
Pump System Conditions – Normal	Status:		A		B		C
Comments							
Diesel System Conditions – Normal	Status:		A		B		C
Comments							
SPRINKLER SYSTEMS B.2.1.3							
Preaction/Deluge Sprinkler Air Pressure	Status:		A		B		C
Comments							

Mark "✓" in the appropriate box to indicate the status of the component as per the following:
☐ A – Done, ☐ B – Deficient, work order generated, ☐ C – Deficiency corrected
For additional comments, please use end of this section.

SIGNATURE: _____

Weekly Fire Safety Systems Maintenance Duties – Comments

Weekly Fire Safety Systems Maintenance Duties – Comments (Cont'd)

Monthly Fire Safety Systems Maintenance Duties

Date: _____ Inspected By: _____

FIRE ALARM SYSTEM B.3.1.1							
Initiate Pull Station, System Response - Normal	Status:		A		B		C
Comments							
EGRESS SYSTEMS APPLYING TO CORRIDORS AND ACCESS TO EXITS B.3.1.2							
Test Emergency Lighting	Status:		A		B		C
Comments							
PORTABLE FIRE EXTINGUISHERS B.3.1.3							
Fire Extinguishers Condition	Status:		A		B		C
Comments							

Mark "✓" in the appropriate box to indicate the status of the component as per the following:
☐ A – Done, ☐ B – Deficient, work order generated, ☐ C – Deficiency corrected
For additional comments, please use end of this section.

SIGNATURE: _____

Monthly Fire Safety Systems Maintenance Duties (Cont'd)

Date: _____ Inspected By: _____

EGRESS SYSTEMS APPLYING TO CORRIDORS AND ACCESS TO EXITS B.3.2.1							
Doors in Fire Separations	Status:		A		B		C
Comments							
Hardware Functioning Properly	Status:		A		B		C
Comments							
SPRINKLER SYSTEMS B.3.2.2							
Wet Pipe Sprinkler Gauges	Status:		A		B		C
Comments							

Mark "✓" in the appropriate box to indicate the status of the component as per the following:
☐ A – Done, ☐ B – Deficient, work order generated, ☐ C – Deficiency corrected
For additional comments, please use end of this section.

SIGNATURE: _____

Monthly Fire Safety Systems Maintenance Duties (Cont'd)

Date: _____ Inspected By: _____

SPRINKLER SYSTEMS B.3.2.2 (Cont'd)							
Inspect Control Valves	Status:		A		B		C
Comments							
Inspect Sprinkler Alarm Valves	Status:		A		B		C
Comments							
Inspect Preaction/Deluge Valves	Status:		A		B		C
Comments							
Wet Pipe System Gauges	Status:		A		B		C
Comments							

Mark "✓" in the appropriate box to indicate the status of the component as per the following:
☐ A – Done, ☐ B – Deficient, work order generated, ☐ C – Deficiency corrected
For additional comments, please use end of this section.

SIGNATURE: _____

Monthly Fire Safety Systems Maintenance Duties – Comments

Monthly Fire Safety Systems Maintenance Duties – Comments (Cont'd)

Quarterly Fire Safety Systems Maintenance Duties

Date: _____ Inspected By: _____

STANDPIPES B.4.1.1							
Condition	Status:		A		B		C
Comments							
DRY HYDRANTS B.4.1.2							
Condition	Status:		A		B		C
Comments							
SPRINKLER SYSTEMS B.4.2.1							
Hydraulic Data Nameplates	Status:		A		B		C
Comments							
Sprinkler System Alarm Devices	Status:		A		B		C
Comments							

Mark "✓" in the appropriate box to indicate the status of the component as per the following:
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For additional comments, please use end of this section.

SIGNATURE: _____

Quarterly Fire Safety Systems Maintenance Duties (Cont'd)

Date: _____ Inspected By: _____

SIAMESE CONNECTION B.4.2.2							
Siamese Connection	Status:		A		B		C
Comments							

Mark "✓" in the appropriate box to indicate the status of the component as per the following:
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Quarterly Fire Safety Systems Maintenance Duties (Cont'd)

Date: _____ Inspected By: _____

SPRINKLER SYSTEMS B.4.3.2							
Test Sprinkler Supply Water	Status:		A		B		C
Comments							
Test Low Air Pressure Alarm	Status:		A		B		C
Comments							
Test Quick-Opening Device	Status:		A		B		C
Comments							
Test Mechanical Water Flow Devices	Status:		A		B		C
Comments							

Mark "✓" in the appropriate box to indicate the status of the component as per the following:
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For additional comments, please use end of this section.

SIGNATURE: _____

Quarterly Fire Safety Systems Maintenance Duties – Comments

Quarterly Fire Safety Systems Maintenance Duties – Comments (Cont'd)

Semi-Annual Fire Safety Systems Maintenance Duties

Date: _____ Inspected By: _____

CLEAN AGENT SUPPRESSION SYSTEMS B.5.1.1							
Clean Agent Suppression Systems	Status:		A		B		C
Comments							

Mark "✓" in the appropriate box to indicate the status of the component as per the following:
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SIGNATURE: _____

Semi-Annual Fire Safety Systems Maintenance Duties (Cont'd)

Date: _____ Inspected By: _____

SPRINKLER SYSTEMS B.5.2.1							
Test Supervisory Switches	Status:		A		B		C
Comments							
WATER STORAGE TANKS B.5.2.2							
Test Water Storage Tanks	Status:		A		B		C
Comments							

Mark "✓" in the appropriate box to indicate the status of the component as per the following:
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SIGNATURE: _____

Semi-Annual Fire Safety Systems Maintenance Duties – Comments

Semi-Annual Fire Safety Systems Maintenance Duties – Comments (Cont'd)

Annual Fire Safety Systems Maintenance Duties

Date: _____ Inspected By: _____

SPRINKLER SYSTEMS B.6.1.1							
Inspect Auxiliary Drains	Status:		A		B		C
Comments							
HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS B.6.1.2							
Confirm Proper Operation with Fire Alarm Signal	Status:		A		B		C
Comments							
EGRESS SYSTEMS APPLYING TO CORRIDORS AND ACCESS TO EXITS B.6.2.1							
30 Minute Battery Test	Status:		A		B		C
Comments							

Mark "✓" in the appropriate box to indicate the status of the component as per the following:
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For additional comments, please use end of this section.

SIGNATURE: _____

Annual Fire Safety Systems Maintenance Duties (Cont'd)

Date: _____ Inspected By: _____

FIRE ALARM SYSTEM B.6.2.2							
System Test as per CAN/ULC S536-M	Status:		A		B		C
Comments							
PORTABLE FIRE EXTINGUISHERS B.6.2.3							
Maintenance	Status:		A		B		C
Comments							
SPRINKLER SYSTEMS B.6.2.4							
Preaction/Deluge Trip Test	Status:		A		B		C
Comments							
Sprinkler Heads, Cabinet and piping	Status:		A		B		C
Comments							

Mark "✓" in the appropriate box to indicate the status of the component as per the following:
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Annual Fire Safety Systems Maintenance Duties (Cont'd)

Date: _____ Inspected By: _____

SPRINKLER SYSTEMS B.6.2.4 (Cont'd)							
Control Valves	Status:		A		B		C
Comments							
FIRE PUMPS B.6.2.5							
Fire Pump Flow Test	Status:		A		B		C
Comments							

Mark "✓" in the appropriate box to indicate the status of the component as per the following:
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For additional comments, please use end of this section.

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Annual Fire Safety Systems Maintenance Duties (Cont'd)

Date: _____ Inspected By: _____

STANDPIPES B.6.2.6							
Hose in Proper Position	Status:		A		B		C
Comments							
Equipment in Place	Status:		A		B		C
Comments							
Condition	Status:		A		B		C
Comments							
PRIVATE FIRE HYDRANTS B.6.2.7							
Flush Private Hydrants	Status:		A		B		C
Comments							

Mark "✓" in the appropriate box to indicate the status of the component as per the following:
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Annual Fire Safety Systems Maintenance Duties (Cont'd)

Date: _____ Inspected By: _____

ELEVATORS B.6.2.8							
Yearly Maintenance	Status:		A		B		C
Comments							
CLEAN AGENT EXTINGUISHMENT SYSTEM B.6.2.9							
Test Clean Agent System	Status:		A		B		C
Comments							
Inspect Enclosure	Status:		A		B		C
Comments							
DRY HYDRANTS B.6.2.10							
Flow Test	Status:		A		B		C
Comments							

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SIGNATURE: _____

Annual Fire Safety Systems Maintenance Duties – Comments