FESHM 6010: FIRE PROTECTION PROGRAM

Revision History

Author	Description of Change	Revision Date
J. Priest & J. Niehoff	Added SAD & User definitions; Removed term "Elements" from chapter title; Applied the FESHM Template; Incorporated references to other section's documents comprising the lab's Fire Protection Program; Updated Technical Appendix A with recent code editions.	March 2013
W. James	Revised definitions	April 2010
W. James	Minor revisions	April 2005
R. Barnes	Initial release Chapter 6010	April 1999

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1.0 INTRODUCTION

The 6000 series of the Fermilab Environment, Safety, and Health Manual (FESHM) chapters describe the organization and structure of the laboratory's fire protection program. This program is to provide a level of fire protection and fire suppressions capability sufficient to minimize losses from fire and related hazards consistent with the best protected class of industrial risks, that is Highly Protected Risk (HPR). Related FESHM chapters include, but are not necessarily limited to, 1010, 1050, 1070, 2001, and 2010.

With regard to facilities, the "code of record" (the code in effect at the time of design) is in effect for the life of the facility. The current code will apply to the facility in the event of a major renovation or if a significant hazard endangers the building occupants as determined by the Environment, Safety, Health, & Quality Section's Fire Protection Engineer (ESH&Q-FPE).

2.0 REFERENCES

- 29 CFR 1910.164 and 1910.165 Other Fire Protective Systems
- 29 CFR 1926.24 Fire Protection and Prevention, 1926.34 Means of Egress
- International Building Code (IBC), 2009
- International Fire Code (IFC), 2009
- National Fire Protection Association (NFPA)
- ES&H Emergency Management Procedure Manual
- FESHM 2050 Emergency Preparedness Program and Fermilab's Emergency Responses Plan
- Fermilab's Facilities Engineering Services Section's Design Guides
- Fermilab's Facilities Engineering Services Section Fire System Maintenance Procedures

Additional Fire Protection Programs and their associated FESHM chapters are:

- 6010 – Fire Protection Program, Technical Appendix A – Inspection, Testing, and Maintenance FP Systems
- 6011 – Periodic Testing of Emergency Lights, Exit Signage, & Site-wide Emergency Alert
- 6012 – Periodic Inspection of Fire Doors
- 6013 – Facility Incident Reporting System (FIRUS)
- 6014 – Fire Watch
- 6015 – Highly Protected Risk Inspection Program
- 6016 – Hazard Map Program
- 6020.1 – Placement of Portable Fire Extinguishers in Primary Beam Enclosures
- 6020.2 – Welding, Burning, and Brazing (Welding, Burning, and Brazing Permit)
- 6020.3 – Storage and Use of Flammable Gases (Work Smart Set 1070)
- 6020.4 – Concepts of Egress
- 6030 – Disablement of Fire Protection Systems
- 6040.1 - Fire Construction Requirements – Fire Retardant for Combustible Materials
- 6040.2 – Fire Construction Requirements – Interior Finish Requirements
- 6040.3 – Fire Stops for Cable Penetrations

3.0 DEFINITIONS

- **International Code Council (ICC)** – recognized publisher of building and fire codes.
- **Building Manager** - Designated employee for each building on site that will serve as the contact point for all activities that will affect that building as a result of daily operations or services requested from both internal and external sources.
- **Fermilab's Fire Department (FFD)** – Individuals of an organization trained and tasked with emergency care, preventing, and extinguishing fires, and other emergency responses, such as ODH.
- **Fire Hazard Subcommittee (FHS)** – Subcommittee of the Fermilab ES&H Committee is delegated the Alternate Authority Having Jurisdiction (AHJ) in absence of the primary AHJ Site Fire Protection Engineer approved by Fermi Site Office (FSO). The FHS is responsible for fire safety, life safety aspects of facilities, processes and experiments, and flammable and compressed gas systems.
- **Fire Protection Engineer (FPE)** – Is delegated as the primary Authority Having Jurisdiction (AHJ) and approved by FSO. The FPE shall be highly trained and educated professional responsible for overseeing the overall implementation and development of the Fermilab fire protection systems.
- **Fire Systems Maintenance (FSM) Technician** – Individuals trained in the inspection, testing, and minor maintenance of fire protection systems throughout the Laboratory (including Water Based Systems, Fire Alarm Components, and Special Systems).
- **FIRUS - Facility Incident Reporting and Utility System** - Lab-wide system that monitors building fire alarm systems and provides alarms at the Communications Center in Wilson Hall.
- **Highly Protected Risk** - A facility that is characterized by a level of fire protection of the best protected class of industrial risks.
- **Irregularity Report** - A form issued by FESS Fire Systems Maintenance (FSM) technicians and Fermilab Fire Department (FFD) personnel to communicate critical deficiencies in fire protection systems to the ESH&Q Fire Protection Engineer (ESH&Q-FPE). The form is presented in chapter 6010.
- **Landlord** - The Division/Section/Center (D/S/C) responsible for the facility or space where work is planned or occurring.
- **NFPA – National Fire Protection Association** – Organization dedicated to fire safety through creating consensus standards and codes.
- **Safety Assessment Document (SAD) Accelerator Readiness Review Documentation** - A formal review document describing the analysis of Fermilab projects, operations and experiments for hazards and their final method of mitigation.
- **Senior Safety Officer (SSO)** - An individual who is assigned duties as the principal ES&H advisor to the division/center/section head.
- **Users/Experimenters** – Individuals responsible for maintenance and operation of an experiment.

4.0 ROLES & RESPONSIBLILITIES

4.1 Laboratory Directorate

- Overall responsibility for the fire protection program rests with the Director's Office.
- The Director assures that adequate resources are available to carry out the elements of the fire protection program as delineated in this chapter.

4.2 Division/Section/Center Heads (D/S/C)

- Implementation and continuing operation of the fire protection program within the areas for which they have responsibility. This includes assuring that all assessments, inspections, tests, and maintenance of fire detection and suppression equipment are conducted by support organizations in accordance with the requirements hereafter set forth.
- General facility audits or audits of inspection reports, irregularity reports, or other documentation (e.g., using the Tripartite Assessment process) can be conducted to ensure compliance with the various elements of the Fire Protection Program.
- For all fire protection system designs, it is the responsibility of the landlord The D/S/C is to assure that reviews are performed which assure that a satisfactory level of protection is being provided, that the installation is satisfactory, that acceptance tests are adequate to assure proper operation of the fire protection system, and that the system has been properly tested.
- D/S/C personnel must periodically audit their fire protection systems through the Tripartite Assessment process.

4.3 Building Manager

- The Building Managers assigned to specific buildings within each D/S/C is responsible for periodic inspections of fire protection system components in accordance with Technical Appendix A.
- Any deficiencies noted during the inspections must be corrected by 1) creating a requisition or work order to correct the condition or 2) contacting the FESS FSM technicians, FFD, or ESH&Q-FPE directly for immediate assistance.
- Manage the emergency preparedness, including exiting and evacuation plans, drills, and readiness in accordance with FESHM 2050.

4.4 Environment, Safety, Health, and Quality Section (ESH&Q)

- The Environment, Safety, Health, & Quality Section Fire Protection Engineer (ESH&Q-FPE) reviews all fire protection system designs to assure that (1) a satisfactory level of protection is being provided, (2) the applicable fire protection provisions of the IBC International Building Code, the International Fire Prevention Code, and National Fire Protection Association Standards (NFPA) are being met, (3) the installation plan is satisfactory, and (4) acceptance tests are adequate to assure proper operation of the fire protection. The ESH&Q is responsible for documenting these reviews.
- The ESH&Q Section will periodically audit fire protection systems as part of the tripartite assessment process.

4.5 ESH&Q- Fire Protection Engineer (ESH&Q-FPE)

- Will assist FESS-Engineering Department as requested during the installation, testing, and acceptance of fire protection systems.
- Conducts periodic assessments of Fermilab facilities to evaluate compliance of each facility with the requirements of the best protected class of industrial risks, or highly protected risks (HPR).
- Monitors system operation, effectiveness, and failures (including the FIRUS system) found during routine testing via the Irregularity Report system and audits.
- Reviews all Fire Department Run Reports.
- Shall be notified by telephone, regardless of day or time, of all significant Fire Department Runs involving:
  - Loss of water protection (i.e. broken water lines)
  - Loss of electrical power resulting in Fire detection and/or FIRUS systems relaying on backup power.
  - Any fire related event that results in physical damage to structures or equipment that had the potential for endangering personnel.
- Notification of the ESH&Q-FPE will be made by the Comm Center upon direction of the Senior Fire Department Officer. This notification will not be made ahead of any time-urgent emergency response notifications or efforts

4.6 Business Services Section (BSS) – Fermilab's Fire Department (FFD)

- The Fermilab Fire Department (FFD) of the Business Services Section responds to fire emergencies.
- The FFD assists the FESS FSM technicians by performing required testing of the fire protection systems, as specified in Technical Appendix A. They will issue Irregularity Reports, as required.
- The FFD generates a Fire Department Run Report, which documents the details of all responses to fire alarms and emergencies.
- The FFD conducts a general fire inspection for all buildings semi-annually and issues a report of findings to the division/section/center SSO.
- The FFD conducts a general inspection of all fire pump rooms monthly.
- The FFD inspects all Village housing units semi-annually (includes alarm systems, CO detectors, GFCI tests, and fire extinguishers) and issues a report to the Building Manager.
- Review and oversee the Hazard Map Program as delineated in Technical Appendix B.

4.7 Business Services Section (BSS) – Fermilab's Security

- The Security Department of the Business Services Section (BSS-SEC) oversees and directs the operation of the COM Center, including testing of FIRUS (see Technical Appendix A).

4.8 Business Services Section (BSS) - Communications Center

- Monitoring FIRUS on a 24 hour basis

- Dispatching emergency response personnel as directed by received FIRUS messages.
- Notifying Duty personnel (FSM Techs, Mechanics, Electricians, etc.) as directed by received FIRUS messages.
- Maintain appropriate call lists, for D/S/C buildings. Providing a yearly update to these lists for accuracy.
- Informing personnel on specified call lists referenced on received FIRUS messages.
- Providing timely status updates to the ESH&Q-FPE and Fire Department when reported FIRUS problems cannot be resolved in a timely manner.
- Providing timely status updates to the ESH&Q-FPE and Fire Department when unexpected issues arise with the FIRUS system.

4.9 Facilities Engineering Service Section (FESS) Engineering Department

- The Facilities Engineering Services Section engineering staff (FESS-Eng) provides design and consulting services, reviews shop drawing submittals, and oversees the installation and acceptance testing of fire protection systems for both new construction and modifications to existing facilities.
- "Turn-key" purchases may occur in which case the Laboratory is purchasing these services from a vendor.

4.10 FESS Fire Systems Maintenance (FSM) Technicians

- The FESS Fire Systems Maintenance (FSM) technicians are responsible for the inspection, testing and maintenance activities for all installed fire protection systems throughout the Laboratory as specified in Technical Appendix A.
- They will issue Irregularity Reports, as required.

4.11 FESS Operations

- FESS Operations personnel provide maintenance and testing for the underground water mains and fire hydrants, as well as other duties specified in Technical Appendix A.

4.12 Senior Safety Officer

- The SSO, or designee for each D/S/C, will review Fire Department Run Reports and investigate the incident as needed.
- The SSO reviews the Building Fire Inspection Report issued by the FFD and aids in correcting any findings, as appropriate.

4.13 Users/Experimenters (Everyone)

- Monitors areas for fire safety. Call Facilities Engineering Services Section (FSM ext. 2924) regarding problems with fire protection systems.
- Provides information about unresolved fire safety problems to the ESH&Q-FPE.

4.14 Responsibilities Matrix

	DIR	D/S/ C	BM	SSO	AD	FESS	ESH&Q -FPE	FFD& SEC
Overall Responsibility	X	X						
FPS Audit		X					X	
FPS Design		X				X	*	
FPS Installation		X				X	*	
FPS Testing		X				X	*	
FPS Acceptance		X				X	*	
FPS Code & Compliance Review							X	
FPS Maint/Test/ Inspection		X	X			X		X
FIRUS Maintenance					X			
Comm Center								X
Fire Incident Response								X
FFD Run Reports				X			X	X
Irregularity Reports						X	X	X
HPR Assessments							X	

** review only*
FPS denotes, Fire Protection System

5.0 PROGRAM DESCRIPTION

The fire protection program encompasses all aspects of fire protection at the Laboratory. The program includes fire prevention practices and procedures, quality construction, protecting buildings and facilities with fixed fire detection and suppression systems, procedures for testing and maintenance of fire protection systems and equipment, providing firefighting devices as appropriate, providing adequate water supplies for fire control, a system of oversight that ensures that DOE orders and mandatory standards applicable to fire protection are met, a staffed and equipped fire department, and most importantly, participation by all personnel from the directorate level down to managers, scientists, engineers, technicians, and supporting employees.

5.1 Design of Fire Protection Systems

- Fire Protection system designs undergo the review process detailed in FESHM Chapter 2010. In addition, the FESHM Chapter 2001, FESS Design Guides, and Construction Document Review and Distribution Procedures are used to review of project design and drawings of both new construction and modifications to existing facilities, including fire protection systems. These projects may be completed by subcontractors or may be "turn-key" purchases from a vendor.
- The ESH&Q-FPE reviews all fire protection system designs to assure that (1) a satisfactory level of protection is being provided, (2) the applicable fire protection provisions of the International Building Code, the International Fire Prevention Code, and National Fire Protection Association Standards (NFPA) are being met, (3) the installation plan is

satisfactory, and (4) acceptance tests are adequate to assure proper operation of the fire protection. The ESH&Q-FPE is responsible for documenting these reviews.

5.2 Users/Experimenters Reviews

- The ESH&Q-FPE reviews all experiments to assure that a satisfactory level of protection is being provided and that the applicable fire protection provisions of the International Building Code, the International Fire Prevention Code, and National Fire Protection Association Standards (NFPA) are being met. The ESH&Q-FPE is responsible for documenting these reviews.
- Flammable liquids, gases and other hazardous materials are to be evaluated to ensure the safety of a building occupant and documented and reviewed through the SAD and FHS Subcommittee, reference FESHM Chapters 2010 and 6020.3.

5.3 Highly Protected Risk – Facility Inspections

- Fermilab maintains facilities that are characterized as a "best protected" class of industrial risk (Highly Protected Risk), equipped with an appropriate level of fire protection.
- The frequency of inspection depends on the mission criticality of the facility to the Laboratory. The loss of those facilities that would have an adverse impact on the Laboratory would have a higher frequency of inspection. The inspection schedule ranges from annually to once every 5 years. The ESH&Q-FPE oversees the inspection process and maintains the inspection schedule.

5.4 Inspection and Maintenance of Fire Protection Systems (Irregularity Report System)

- Technical Appendix A specifies the schedule and responsibilities for the inspection, testing and maintenance activities for all installed fire protection systems throughout the Laboratory. Building Managers that detect serious irregularities must notify the FSM Technicians of those conditions. FSM technicians (and FFD) must submit all irregularities (using the Irregularity Report System) to the ESH&Q-FPE. The FSM technicians or ESH&Q-FPE will communicate with the affected division/section and suggest corrective strategies. The D/S/C must then document the deficiency in frESHtrk and make the needed corrections.

5.5 Facility Incident Monitoring and Communication

- The Facility Incident Reporting and Utility System (FIRUS), a proprietary supervising station system, monitors fire protection, security and utility systems at Fermilab. FIRUS system alarms are monitored in the Fermilab Communications Center (Comm Center), located on the ground floor of Wilson Hall. The Comm Center also receives telephone calls reporting fires. The Comm Center dispatches the FFD and security personnel. The Security Department of the BSS Section oversees and directs the operation of the Comm Center. The FFD generates a Fire Department Run Report, which documents the details of all responses to fire alarms and emergencies. The ESH&Q-FPE and the affected D/S/C Senior Safety Officer reviews the Fire Department Run Reports and investigates as needed.

5.6 Response to Fire Emergencies

The FFD and Security will respond to all fire emergencies at all times. If needed, additional assistance will be provided by nearby municipal fire departments.

6.0 TECHINCAL APPENDIX A: INSPECTION, TESTING AND MAINTENANCE OF FIRE PROTECTION SYSTEMS

The following matrices address the NFPA code requirements for inspection, testing and maintenance of fire protection systems installed at Fermilab. The requirements of the following standards are included:

FM 2-81 Factory Mutual Global, Fire Protection System Inspection, 2012 edition

NFPA 12 Standard on Carbon Dioxide Systems, 2011 edition
NFPA 12A Standard on Halon 1301 Fire Extinguishing Systems, 2009 edition
NFPA 13 Standard for the Installation of Sprinkler Systems, 2013 edition
NFPA 14 Standard for the Installation of Standpipe and Hose Systems, 2010 edition
NFPA 15 Standard for Water Spray Fixed Systems for Fire Protection, 2012 edition
NFPA 17 Standard for Dry Chemical Extinguishing Systems, 2009 edition
NFPA 17A Standard for Wet Chemical Extinguishing Systems, 2009 edition
NFPA 20 Standard for the Installation of Centrifugal Fire Pumps, 2010 edition
NFPA 24 Standard for the Installation of Private Fire Service Mains & Their Appurtenances, 2010 edition
NFPA 25 Standard for the Inspection, Testing, & Maintenance of Water-Based Fire Protection Sys., 2011
NFPA 72 National Fire Alarm & Signaling Code, 2013 edition
NFPA 80 Standard for Fire Doors and Other Opening Protective, 2013 edition
NFPA 90A Standard for the Installation of Air-Conditioning & Ventilating System, 2009 edition
NFPA 101 Life Safety Code, 2012 edition
NFPA 110 Standard for Emergency & Standby Power Systems, 2010 edition
NFPA 204 Standard for Smoke and Heat Venting, 2012 edition
NFPA 221 Standard for Fire Walls and Fire Barrier Walls, 2009 edition
NFPA 750 Standard on Water Mist Fire Protection Systems, 2010 edition
NFPA 1962 Standard for the Inspection, Care & Use of Fire Hose, Couplings & Nozzles, 2008 edition
NFPA 2001 Standard on Clean Agent Fire Extinguishing Systems, 2012 edition

FESHM 6011 Periodic Testing of Emergency and Exit Lights
FESHM 6012 Periodic Testing of Fire Doors
FESHM 6013 Facility Incident Utility System (FIRUS)

The specific testing methods or inspection procedures can be obtained from the ESH&Q Fire Protection Engineer, the FESS Fire System Maintenance Group, or the Fermilab Fire Department.

Abbreviations are as follows:

HPR Highly Protected Risk, reference FESHM 6015
FSM FESS Fire Systems Maintenance Group
FFD Fermilab's Fire Department
ESH&Q ESH&Q Fire Protection Staff
COMM Communications Center
BM Building Manager, reference FESHM 2050
SSO Division/Section Senior Safety Officer, reference FESHM 2010
TBD To Be Determined

**Frequency deviates from Code or Standard*

RECOMMENDED NFPA TESTING FREQUENCIES MATRIX - WATER BASED SYSTEMS

ITEM	CODE REFERENCE	ACTIVITY	FREQUENCY	RESPONSIBILITY
SPRINKLER SYSTEMS NFPA 25				
Sprinkler head	5.21	Inspection	*At same frequency as HPR assessment. (Floor-level visual examination of a representative sample)**	ESH&Q
Spare sprinkler head	5.2.1.3	Inspection	*At same frequency as HPR assessment**	FSM
Sprinkler Head	5.3.1	Testing	*Sample tests: Standard sprinkler 50 years, or quick response 20 years, dry pendent/sidewall 10 years*	FSM
Sprinkler System Piping	5.2.2	Inspection	*At same frequency as HPR assessment**	ESH&Q
Pipe hangers	5.2.3	Inspection	*At same frequency as HPR assessment**	ESH&Q
Gauges, wet pipe system	5.2.4.1	Inspection	FFD Quarterly, FSM Annually, BM Monthly (for condition and water pressure)	Building Manager; FFD and FSM during testing.
Gauges, dry pipe system	5.2.4.3	Inspection	FFD Quarterly, FSM Annually, BM Monthly (for condition and air and water pressure)	Building Manager; FFD and FSM during testing.
Buildings	5.2.5	Inspection	Annually, to assure adequate heat for wet pipe systems or dry pipe riser enclosures	Building Manager
Hydraulic nameplate on sprinkler systems	5.2.7	Inspection	*At same frequency as HPR assessment**	ESH&Q
Gauges	5.3.2	Test	*During inspection or system test**	FFD and FSM
Antifreeze System Solutions	5.3.4	Test	Annually	FSM
Dry Pipe System Compressors & Air Dryers	5.4.2.2 5.4.2.3	Maintenance	Annually	FSM
STANDPIPE & HOSE SYSTEMS NFPA 25 and NFPA 1962				
Control Valves, locked or supervised	Table 13.1 13.3.2.1.1	Inspection	FFD Quarterly, FSM Annually BM Monthly	Building Manager, FFD and FSM
Piping	Table 6.1 6.2.1	Inspection	*At same frequency as HPR assessment**	ESH&Q
Hose Connections, Non-pressure reducing	Table 13.1 13.5.7	Inspection	Quarterly	FFD
Hose Connections,	13.5.6.2.2	Test	Every three years – (This only	Not applicable

ITEM	CODE REFERENCE	ACTIVITY	FREQUENCY	RESPONSIBILITY
Non-pressure reducing attached to Sprinkler System			applies to Class III hose connections, Fermilab has Class I hose services installed in NuMI Tunnel & Wilson Hall	
Hose Connections, Non-pressure reducing	13.5.8	Maintenance	As needed based on FFD inspection	FSM
Hose Connections, Pressure reducing	Table 13.1 13.5.2.1	Inspection	Quarterly	FFD
Hose Connections, Pressure reducing	Table 13.1 13.5.2.2	Test Full Flow	Every five years	TBD
Hose Connections , Pressure reducing	13.5.2.3	Test Partial Flow	Annually	TBD
Hose Connections, Pressure reducing	13.5.2.2.1	Maintenance	As needed based on FFD inspection	FSM
Hose Cabinets	13.5	Not Applicable	Not Applicable	All Class III hoses from cabinets have been removed
Hose	13.5	Not Applicable	Not Applicable	All Class III hoses from cabinets have been removed
Hose Nozzles	13.5	Not Applicable	Not Applicable	All Class III hoses from cabinets have been removed
Hose storage	13.5	Not Applicable	Not Applicable	All Class III hoses from cabinets have been removed
Flow Test	Table 6.1 6.3.1.1	Test	5 Years	FESS/Engineering and FSM
Main Drain Test	6.3.1.5	Test	Annually	FSM
PRIVATE FIRE SERVICE MAINS NFPA 25				
Hydrants (dry barrel)	7.2.2.4	Inspection	Monthly	FFD
Hydrants (dry barrel)	7.3.2, 7.4.3 Table 7.1	Flush and Maintenance	Annually	FESS/Operations
Mainline Strainers	7.2.2.3	Inspection	*Monthly 16-inch strainers at Casey's, configured with automatic backwash**	FESS/Operations
Mainline Strainers	7.4.2	Maintenance	*Annually and after significant flow if inspection indicates need**	FESS/Operations
Piping (exposed)	7.2.2.1	Inspection	*Daily at pump house**	FESS/Operations

ITEM	CODE REFERENCE	ACTIVITY	FREQUENCY	RESPONSIBILITY
Piping	7.3	Flow Test	5 years or after significant change	FESS/Engineering
FIRE PUMPS NFPA 25				
Pump House, heating	8.2.2(1)	Inspection	Weekly	FESS/Operations
Pump House, ventilating louvers	8.2.2(1)	Inspection	Weekly	FESS/Operations
Fire Pump System	8.2.2(2)	Inspection	Electric Monthly, Diesel Weekly (Based on NFPA 25 2011 Edition)	FESS/Operations
Pump Operations, no flow condition	8.3.1	Test	Weekly	FESS/Operations
Pump Operations, flow condition	8.3.3.1	Flow Test	Annually – Except churn test to be conducted every 3 years	FSM/Contractor
Electrical System	8.5	Maintenance	Annually	FESS/Operations
Controller	8.5	Maintenance	Annually	FESS/Operations
Motor	8.5	Maintenance	Annually	FESS/Operations
WATER SPRAY FIXED SYSTEMS NFPA 25				
Drainage, Inspection	10.2.8	Inspection	*Annually – The presence or lack of adequate drainage will not affect the ability of the system to extinguish fire; it is a secondary effect only, with possible environmental impact**	FSM
Pipe	10.2.1.1 10.2.1.2 10.2.4 10.2.4.1	Inspection	*At same frequency that HPR facility assessment is required**	ESH&Q
Fittings	10.2.4	Inspection	*At same frequency that HPR facility assessment is required**	ESH&Q
Hangers	10.2.4.2	Inspection	*At same frequency that HPR facility assessment is required**	ESH&Q
Supports	10.2.1.1	Inspection	*At same frequency that HPR facility assessment is required**	ESH&Q
Nozzles	10.2.1.1.2, 6 10.2.5.1, 2	Inspection	Annually (part of annual test)	FSM
Nozzles	10.2.1.3 10.2.1.6	Test	Annually	FSM
Strainers	10.2.7	Inspection	Domestic water source – every 3 yrs. following the full flow trip test	FSM

ITEM	CODE REFERENCE	ACTIVITY	FREQUENCY	RESPONSIBILITY
			Raw water source - annually, and after each operation of the system	
Strainers	10.2.1.3 10.2.1.7 10.2.7	Test	Annually	FSM
Strainers	10.2.1.4 10.2.1.7 10.2.7	Maintenance	Domestic water source – every 3 yrs. following the full flow trip test Raw water source - annually, and after each operation of the system	FSM
Manual Release	10.2.1.3 10.36	Test	Annually	FSM
Water Spray System	10.3, Chapter 13	Test	Annually	FSM
Water Spray System	10.2.1,4, Chapter 13	Maintenance	Annually	FSM
VALVES AND FD CONNECTIONS NFPA 25				
Control Valves, locked or supervised	Table 13.1 13.3.2.1.1	Inspection	FFD – Monthly, Post Indicator Valves FFD – Quarterly, Outside Screw & Yoke FSM – Annually, Outside Screw & Yoke	PIVs – FFD OS&Y's – FFD and FSM during testing.
Post Indicator Valves, position	Table 13.1 13.3.3	Test	FFD - Monthly inspection only FESS/Ops - Annually (during annual ICW main flushing)	FFD, FESS/Ops
Post Indicator Valves, position	Table 13.1 13.3.2	Inspection	FFD - Monthly inspection only FESS/Ops - Annually (during annual ICW main flushing)	FFD, FESS/Ops
Control Valves, operation	Table 13.1	Test	Annually	FSM
Control Valves, supervisory	Table 13.1 13.3.3.5	Test	Annually (These valves are locked in the open position)	FSM
Control Valves	Table 13.1	Maintenance	*As needed* *Based on inspection and test**	FSM FESS/Operations
Alarm Valves			See Check Valves	All alarm valves on site have been converted to simple check valves - no alarm functions
Check Valves, interior	Table 13.1	Inspection	*As needed*	FSM

ITEM	CODE REFERENCE	ACTIVITY	FREQUENCY	RESPONSIBILITY
			*Based on inspections and tests of systems**	
Preaction/Deluge/Dry Pipe Valves, exterior	Table 13.1 13.4.3.1.6 13.4.4.1.4	Inspection	FSM - Annually (as part of the test) BM – Quarterly	FSM, Building Manager
Preaction/Deluge Valves interior	13.4.3.1.7.1	Inspection	*As needed**	FSM
Dry Pipe Valves, interior	Table 13.1	Inspection	Annually	FSM
Preaction/Deluge/Dry Pipe Valves priming water	Table 13.1	Test	Annually	FSM
Preaction/Deluge/Dry Pipe Valves low air pressure alarm	Table 13.1	Test	Annually	FSM
Dry Pipe Valve Compressor Meters	No code reference	Inspection	Monthly These meters monitor compressor cycling to identify if systems have air leak problems	BM
Preaction/Deluge, full flow	Table 13.1 13.4.3.2.2	Test	*Water Spray (Deluge)* *Annual (use test valve to isolate system where available if raw water source or high value or if access to system drains is not available due to accelerator operation)* *Full flow - minimum of 3 years**	FSM
Dry Pipe Valves/Quick Opening Devices, test	Table 13.1 13.4.4.2.4	Test	Quarterly	FSM
Dry Pipe Valves/Quick Opening Devices, trip test	Table 13.1 13.4.4.2.2	Test	Annually	FSM
Dry Pipe Valves/Quick Opening Devices, full flow trip test	Table 13.1 13.4.4.2.2.2	Test	*Every three years**	FSM
Dry Pipe Systems, air leak test	13.4.4.2.9	Test	Every three years	In-Lieu of testing, counter boxes have been installed and tested annually by FSM. In addition, air compressors are monitored by FIRUS

ITEM	CODE REFERENCE	ACTIVITY	FREQUENCY	RESPONSIBILITY
System Strainers, Filters, Orifices – Preaction/Deluge/Dry Pile Valves	Table 13.1 13.4.3.1.8 13.4.1.6	Inspection	*Every three years after the Full Flow Trip Test**	FSM
Pressure Reducing and Relief Valves, sprinkler/standpipe (Sprinkler Relief Valves)	Table 13.1 13.5.1.1	Inspection	*Annually, or when gage inspection indicates excessive pressure**	FSM
Pressure Relief Valves, Fire Pump	13.5.6.1.2 13.5.6.1.1 13.5.6.2.1	Inspection	Weekly	FESS/Operations
Pressure Relief Valves, sprinkler systems	13.5.1.3	Test	Annually	FSM
Fire Department Connections	13.7.1	Inspection	FFD Monthly FSM Annually	FFD
Main Drain	Table 13.1 13.3.3.4	Test	*Annually and after system disablement (including disablement of supply mains)**	FSM
WATER MIST SYSTEMS NFPA 750				
Water Tank, Supervised	12.2.2	Inspection	*Annually**	FSM
Water Tank	12.2.2	Maintenance	Annually, including drain and refill	FSM
Air Pressure Cylinders, Supervised	12.2.2	Inspection	*Annually**	FSM
System Operating Components, Supervised	12.2.2	Inspection	Annually	FSM
Batteries, Control Panel, Interface Equipment	12.2.2	Inspection	Annually	FSM
Batteries	12.2.2	Test	Annually	FSM
Strainers and Filters	13.4.3.1.8	Inspection	Annually	FSM
Strainers and Filters	12.2.2	Maintenance	After system operation	FSM
Control Equipment,	NFPA 72	Inspection	Annually	FSM

ITEM	CODE REFERENCE	ACTIVITY	FREQUENCY	RESPONSIBILITY
Supervised				
Control Equipment, Supervised	NFPA 72	Test	Annually	FSM
Piping, Fittings, Nozzles, Hangers, tubing	12.2.2	Inspection	*At same frequency that HPR facility assessment is required. Also after operation**	ESH&Q FSM after operation
Pressure Relief Valve	13.5.6.2.2	Test	Annually	FSM
Water Level Switch	12.2.2	Test	Annually	FSM
Release Mechanisms	12.2.2	Test	Annually	FSM
Control Unit/Program Logic Control	12.2.2	Test	Annually	FSM
Water	12.2.2	Test	*Annually. This is an analysis of the water content**.	FSM
System, Flow Test	10.1	Test	Annually.	FSM
System, Flushing	12.2.2	Maintenance	Annually	FSM
Pressure Cylinders	12.2.2	Test	Before recharge if >5 yrs. From last test - 12 yrs. max.	FSM (Sub-Contracted)
Automatic Nozzles	12.2.2	Test	20 yrs.	FSM (Sub-Contracted)
Backflow Prevention Device	Table 12.2.2	Test	*Annually – Illinois Plumbing Code, Cross Connection Control Device Inspector*	FSM/FESS-Operations

RECOMENDED NFPA TESTING FREQUENCIES MATRIX - FIRE ALARM SYSTEMS

ITEM	CODE REFERENCE	ACTIVITY	FREQUENCY	RESPONSIBILITY
CONTROL EQUIPMENT (Monitored) NFPA 72				
Function	Table 14.4.2.2	Test	Annually	FSM
Fuses	Table 14.3.1 Table 14.4.2.2	Insp. & Test	Annually	FSM
Interface Equipment	Table 14.3.1 Table 14.4.2.2	Insp. & Test	Annually	FSM
Lamps & LED's	Table 14.3.1 Table 14.4.2.2	Insp. & Test	Annually	FSM
Primary Power Supply	Table 14.3.1 Table 14.4.2.2	Insp. & Test	Annually	FSM
Transponders	7-3.2, Table 7-3.2	Test	Annually	FSM
ENGINE DRIVEN GENERATORS NFPA 110				
Appurtenant components (batteries, fuel Level, etc.)	8.4.1	Inspection	Weekly	BM
Emergency standby power (Diesel Generator)	8.4.2	Test	Monthly Exercise with Load	FESS/Operations
BATTERIES - FIRE ALARM SYSTEM NFPA 72				
Battery, Sealed Lead-Acid	14.3.1	Inspection	*Semiannual for Dorados.* *Annual for all others (they are remotely monitored)**	FSM
Battery, Sealed Lead-Acid	14.4.2.2	Replacement	*Every 4 years**	FSM
Charger	14.4.2.2	Test	*Annually**	FSM
Discharge, Sealed Lead-Acid	14.4.2.2	Test, 30 min.	*Annually**	FSM
Load Voltage, Sealed Lead-Acid	14.4.2.2	Test	*Annually**	FSM
TRANSIENT SUPPRESSORS NFPA 72				
	14.3.1	Inspection	*Annually. Supervised for operation**	FSM

ITEM	CODE REFERENCE	ACTIVITY	FREQUENCY	RESPONSIBILITY
CONTROL PANEL TROUBLE SIGNALS NFPA 72				
LEDs Indicating lights	14.3.1	Inspection	*Annually. Supervised for operation**	FSM
LEDs Indicating lights LCD Screens	14.4.2.2	Test	Annually	FSM
EMERGENCY VOICE/ALARM COMMUNICATIONS EQUIPMENT NFPA 72				
Speakers	14.3.1	Inspection	*Annually*	FSM/ESH&Q
Speakers/Amplifiers	14.4.2.2	Test	Annually	FSM
REMOTE ANNUNCIATORS NFPA 72				
Keypad Annunciator	14.3.1	Inspection	*Annually**	FSM
Keypad/CPU Annunciator	14.4.2.2	Test	Annually	FSM
INITIATING DEVICES NFPA 72				
Air Sampling	14.3.1	Inspection	*Annually. Systems are remotely supervised**	FSM
Air Sampling	14.4.2.2	Test	Annually	FSM
Duct Detectors	14.3.1	Inspection	*Annually* *Systems are remotely supervised**	FSM
Duct Detectors	14.4.2.2	Test	Annually	FSM
Electromechanical Releasing Devices	14.3.1	Inspection	*Annually**	FSM
Electromechanical Releasing Devices	14.4.2.2	Test	Annually	FSM
Fire Suppression System Switches	14.3.1	Inspection	*Annually* *Systems are remotely supervised**	FSM
Fire Suppression System Switches	14.4.2.2	Test	Annually	FSM
Fire Alarm Boxes	14.3.1	Inspection	*Annually**	FSM
Fire Alarm Boxes	14.4.2.2	Test	Annually	FSM
Heat Detectors	14.3.1	Inspection	*Annually* *Systems are remotely supervised**	FSM
Heat Detectors	14.4.2.2	Test	Annually	FSM
Radiant Energy Fire Detectors	14.3.1	Inspection	*Annually* *Currently None on site**	FSM
Radiant Energy Fire Detectors	14.4.2.2	Test	*Annually* *Currently None on site**	FSM

ITEM	CODE REFERENCE	ACTIVITY	FREQUENCY	RESPONSIBILITY
Smoke Detectors	14.3.1	Inspection	*Annually* *Systems are remotely supervised**	FSM
Smoke Detectors, Functional	14.4.2.2	Test	Annually	FSM
Smoke Detectors, Sensitivity	14.4.2.2	Test	*Annually* *Done only on systems capable of giving a Sensitivity Report, otherwise just a functional test and cleaning**	FSM
Fire-Gas and Other Detectors	14.4.2.2	Test	Annually	Reference FESHM 6013
Supervisory Signal Devices	14.3.1	Inspection	*Annually* *Systems are remotely supervised**	FSM
Supervisory Signal Devices, except valve tamper	14.4.2.2	Test	Annually Systems are remotely supervised.	FSM
Supervisory Signal Devices, valve tamper	NFPA 25, 13.3.5.1	Test	*Annually* *Systems are remotely supervised and valves are locked**	FSM
Waterflow Devices	14.3.1	Inspection	*Annually, during test**	FSM
Waterflow Devices	14.4.2.2	Test	FFD Quarterly, FSM Annually Maintain current frequency based on water quality and past history of failures during testing	FFD and FSM
INTERFACE EQUIPMENT NFPA 72				
Elevator recall, HVAC Shut-down, etc.	14.3.1	Inspection	*Annually**	FSM
Elevator recall, HVAC Shut-down, etc.	14.4.2.2	Test	Annually	FSM
SPECIAL HAZARD EQUIPMENT NFPA 72				
Abort switch, release solenoid, cross-zone circuit, etc.	14.4.2.2	Test	Annually	FSM
ALARM NOTIFICATION APPLIANCES – Supervised NFPA 72				
Audible & Visual Devices	14.3.1	Inspection	*Annually**	FSM
Audible & Visual Devices	14.4.2.2	Test	*Annually**	FSM

ITEM	CODE REFERENCE	ACTIVITY	FREQUENCY	RESPONSIBILITY
SUPERVISING STATION FIRE ALARM SYSTEM NFPA 72				
Transmitter	14.3.1	Inspection	*Annually**	FSM
Transmitter	14.4.2.2	Test	Annually	FSM
Receivers	14.3.1	Inspection	Semiannually	COMM
Receivers	14.4.2.2	Test	Monthly Reference FESHM 6013	FSM/COMM
SPECIAL PROCEDURES NFPA 72				
Alarm Verification	14.3.1	Inspection	*Annually.* *Systems are remotely supervised**	FSM
Multiplex Systems	14.4.2.2	Test	Annually	FSM

RECOMMENDED NFPA TESTING FREQUENCIES MATRIX – SPECIAL FIRE SUPPRESSION SYSTEMS

ITEM	CODE REFERENCE	ACTIVITY	FREQUENCY	RESPONSIBILITY
CARBON DIOXIDE SYSTEMS NFPA 12				
System, Condition	4.8.1	Inspection	Monthly	FFD
System, Operation	4.8.1	Insp. & Test	Annually	FSM
Hoses	4.8.2.2	Test	Replace hose every 5 Years.	FSM
High Pressure Cylinders	4.8.3.5.1	Weighing	Semiannually (There are no gages on the CO_2 cylinders)	FSM
HALON 1301 SYSTEMS NFPA 12A				
System	6.1	Inspection	*Monthly**	FFD
System	6.1	Test	*Annually**	FSM
Cylinders	6.2.1	Inspection	*Annually* *Maintain current procedure to inspect at annual test or after a discharge**	FSM – Sub-Contracted if Discharge
Cylinders	6.2.1	Test	*When Discharged**	FSM (Sub-Contracted)
Hose	6.3.1	Test	*Replace hose every 5 Years**	FSM
Protected Enclosure	6.4.1	Inspection	*Same frequency that HPR facility assessment is required**	ESH&Q
Protected Enclosure	6.4.1	Integrity Test	As indicated	FESS (Sub-Contracted)
DRY CHEMICAL SYSTEMS NFPA 17				
System	11.2.1	Inspection	Monthly	FFD
Protected Hazard	11.3.1.1	Inspection	*At same frequency that HPR facility assessment is required**	ESH&Q
System Components	11.3.1	Maintenance	*Annually**	FSM
Dry Chemical	11.3.1.2	Inspection	Every 6 years	FSM
System, including Releasing Devices	11.3.1	Test	Annually	FSM
Fixed-temperature Fusible metal alloy temperature sensors	11.3.2.1	Replacement	Annually	FSM
Other fixed-temperature sensors	11.3.3	Maintenance	Annually	FSM
Cylinders	11.5.1	Hydro Test	12 years	FSM (Sub-Contracted)

ITEM	CODE REFERENCE	ACTIVITY	FREQUENCY	RESPONSIBILITY
Hose	11.5.2	Hydro Test	Replace hose every 12 Years	FSM
WET CHEMICAL SYSTEMS NFPA 17A				
System	7.2.1	Inspection	Monthly	FFD
Protected Hazard	7.2.2	Inspection	Semiannually	FSM (Sub-Contracted)
System Components	7.2.2	Maintenance	Semiannually	FSM (Sub-Contracted
System, including Releasing Devices	7.2.2	Test	Semiannually	FSM (Sub-Contracted)
Fixed-temperature Fusible metal alloy temperature sensors	7.3.3.2	Replacement	*Annually**	FSM (Sub-Contracted)
Other fixed-temperature sensors	7.3.4	Maintenance	*Annually**	FSM (Sub-Contracted)
Cylinders	7.5.1	Hydro Test	12 years	FSM (Sub-Contracted)
Hose	7.5.1	Hydro Test	Replace hose every 12 years	FSM
CLEAN AGENT SYSTEMS NFPA 2001				
System	7.1.1	Inspection	*Monthly**	FFD
System	7.1.1	Insp. & Test	Annually	FSM
Agent Quantity	7.1.3	Inspection	*Annually**	FSM
Refillable Container Pressure	7.1.4	Inspection	Semiannually when accessible.	FSM
Cylinders	7.2.2	Inspection	*Annually* *Maintain current procedure to inspect at* *annual test or after a discharge**	FSM – (Sub-Contracted if Discharge)
Cylinders	7.2.2	Test	*When discharged if over 5 years from last test**	FSM (Sub-Contracted)
Hose	7.3.1	Inspection	Annually	FSM
Hose	7.3.2.1	Test	Replace hose every 5 Years	FSM
Protected Enclosure	7.4.1	Inspection	*At same frequency that HPR facility assessment is required**	ESH&Q
Protected Enclosure	7.4.1	Integrity Test	As indicated	FESS (Sub-Contracted)
EMERGENCY LIGHTING/EXIT SIGNAGE NFPA 101				
Emergency Lighting	7.8 & 7.9	Testing	Reference FESHM 6011	BM
Exit Lighting	7.8 & 7.9	Testing	Reference FESHM 6011	BM
FIRE BARRIER ASSEMBLIES NFPA 80, NFPA 204, NFPA 221				

ITEM	CODE REFERENCE	ACTIVITY	FREQUENCY	RESPONSIBILITY
Penetrations	NFPA 221, 4.4.4	Inspection	*Same frequency that HPR facility assessment is required**	ESH&Q
Smoke Partitions	NFPA 221, 4.4.4	Inspection		TBD
Fire/Smoke Vents	NFPA 204, 12.3.2.2	Inspection	Annually	TBD
Doors	NFPA 80, 5.2.1	Inspection	Annually, Reference FESHM 6012	BM
Fire/Smoke Dampers	NFPA 80, 19.4.1.1	Inspection	4 years	TBD