

Fire Prevention and Protection



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RC-UPF DMC

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This document has been reviewed by a Y-12 DC/ RO and has been determined to be UNCLASSIFIED, not UCNI, and contains no CUI based upon current classification guidance. This review does not constitute a review for CUI outside of classification guidance and does not constitute clearance for Public Release.
Name: Steve Buffalo Date: 07/15/24

REVISION LOG

Revision 12	
<input checked="" type="checkbox"/> Intent <input type="checkbox"/> Non-Intent	Implements PRMS Requirements: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<ul style="list-style-type: none"> • These changes are in response to Condition Report 25774-000-GCA-GAM-04771, <i>APMO-MC-001/CAP Findings 001-004/OPS-MC01, UPF Fire Protection Procedure is Not Part of Program Approved by Federal Field Element and Program Noncompliances</i>, 25774-000-GCA-GAM-04772, Y-12 APMO-F-005, <i>M&O Finding-Egress Travel Paths Are Not Properly Marked</i>, 25774-000-GCA-GAM-04773, Y-12 APMO-F-006 <i>M&O Finding-Unauthorized Combustible Materials Stored in Unprotected Structures (MPB, SAB, and PSB)</i>, 25774-000-GCA-GAM-04775, Y-12 APMO-F-008 <i>M&O Finding-Required UPF Fire Investigations Were Not Performed</i>, 25774-000-GAC-GAM-04777, Y-12 APMO-PP-001 <i>Performance Problem-Inconsistent Immediate Actions for Fires in UPF-CP-211</i>, Y17-95-64-8977, <i>UPF-CP-277</i>, and <i>OT-SH-801768-A001</i>, 25774-000-GAC-GAM-04779, Y12-APMO-PP-003 <i>Performance Problem-Egress stairwells are not free of obstructions or impediments</i>, and 25774-000-GAC-GAM-04796, <i>Violation of Procedure UPF-CP-211 Requirements for Combustible Liquids-Paint Mixing Inside MPB</i> • No forms have been edited as part of this revision • Revised Section 1.1, <i>Purpose</i>, to specify that UPF-CP-211 is an implementing procedure to Y79-001 • Added Section 1.3, <i>Temporary Compensatory Measures</i> • Updated Section 2.4, <i>BNI Fire Protection Engineer</i> • Updated Section 3.3, <i>Pre-Fire Plans</i> • Updated Section 3.4, <i>Fire Investigations</i>, to clarify requirements pertaining to Fire event notification and investigation • Included detail in Sections 4.3, <i>Means of Egress</i>; and 5.1.2, <i>Planned Impairments</i>, related to the PSUM responsibilities to update egress signage due to impairments • Updated Section 4.3, <i>Means of Egress</i>, to clarify requirements pertaining to maintaining means of egress free of all obstructions • Updated Sections 5.1.3, <i>Fire Patrol</i>; and 5.2, <i>Fire Safety Monitor</i>, to specify Fire Patrols and Fire Safety Monitors shall have no collateral assignments • Updated Section 5.1.3, <i>Fire Patrol</i>; and 5.2, <i>Fire Safety Monitor</i>, to change the frequency of rounds performed by Fire Patrol and Fire Safety Monitor to no more than 30 minutes per round • Added Section 5.2, <i>Fire Safety Monitor</i>, to detail requirements pertaining to Fire Safety Monitors • Updated Section 5.12.1, <i>General Requirements</i>, to detail methodology to control transient combustibles in unprotected buildings • Updated Section 6.0, <i>Fire Prevention/Protection Self-Inspections</i>, to add detail related to the self-inspections • Other changes include: <ul style="list-style-type: none"> ○ Updated to current CMGD template ○ Updated references and acronyms ○ Editorial changes 	

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Revision 11

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- These changes are in response to Condition Report 25774-000-GCA-GAM-04172, *Disconnect between Y-12 Fire Protection Program Manual Y79-001 and UPF-CP-211 Relative to Fire Event Reporting and Investigation*
 - Added new Section 3.4, *Fire Investigations*, to capture requirements for Fire event reporting and investigation
 - In Section 5.10.1, added “Aggregate” to beginning of 5th paragraph; added requirements for use of Class I Flammable Liquids in enclosed spaces
 - Added specific definition of Fire in Appendix A, *Definitions*
- These changes are in response to Condition Report 25774-000-GCA-GAM-03941-12, *CNS Concerns with BNI Compliance with Records Identification and Retention Requirements (CNS letter 25774-22-CNS-017)*
 - Section 4.4, last bullet changed to emphasize ToolHound is the primary method by which transient Fire extinguishers are checked out and tracked, that a final report will be generated for delivery to CNS, and that UCN-23356, *Fire Extinguisher Check-Out Log*, may be used in the event ToolHound is unavailable
 - Section 6.0 changed to differentiate between informal assessments done in Chekhov and formal assessments done in accordance with Y60-95-803 and stored in InfoWorks
 - Modified Section 8.0, *Records*, to remove UCN-23356 as a record and to modify UCN-23488, *Fire Patrol Log*, to be kept in InfoWorks with a Doc Type of FPL
- UCN-23506, *Fire Investigation Report*, was created to support this Procedure
- Removed Section 2.4, *Environmental, Safety and Health Manager, BNI*
- Other changes include:
 - Updated to current CMGD template
 - Updated references and acronyms
 - Editorial changes

Previous revisions on record

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1.0 INTRODUCTION

1.1 Purpose

This Procedure provides Fire prevention and protection guidelines and requirements to protect workers and property at the Uranium Processing Facility (UPF) construction site implementing the applicable requirements of Y79-001, *Y-12 Fire Protection Program Manual* and E-SD-2004, *Fire Protection Program*.

1.2 Scope

This Procedure applies to all personnel at the UPF during the Bechtel National, Inc. (BNI) scope of work for the Project.

This Procedure is applicable during all phases of construction, including startup and testing activities, for the UPF. UPF buildings that have completed beneficial occupancy and have been handed over to Consolidated Nuclear Security (CNS) Operations care, custody, and control are outside the scope of this Procedure and shall fall under Y79-001.

1.3 Temporary Compensatory Measures

1.3.1 Nothing in this procedure shall prevent short-term, temporary compensatory measures from being put into place to address deviations from this procedure. Such compensatory measures shall be approved by BNI Fire Protection Engineering and the CAHJ.

1.3.2 Temporary compensatory measures shall be disseminated via project-wide communications. Communications should include scope of the compensatory measure(s) as well as any personnel limitations (i.e., restrictions on the number of workers in a given area or restrictions on allowable work areas due to proximity of an approved means of egress [such as an exit stair]).

2.0 RESPONSIBILITIES

2.1 UPF Site Manager

The UPF Site Manager is responsible for:

- Implementing and enforcing requirements of this Procedure
- Providing personnel, support facilities, and other resources necessary to effectively implement this Procedure

2.2 UPF Project Startup Manager

The UPF Project Startup Manager (PSUM) is responsible for accepting work from Construction, and:

- Implementing and enforcing the requirements in this Procedure as it applies to Startup work scope

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- Providing personnel, support facilities, and other resources necessary to effectively implement this Procedure
- Authorizing or delegating coordination of Impairments or modifications to active Fire protection systems (i.e., sprinkler systems, Fire detection and alarm systems, Fire hydrants, underground water supplies, Fire barriers) under the control of Startup
- Providing inspection, testing and maintenance for Fire protection systems pending turnover from Startup to Operations

2.3 Environmental, Safety, and Health Manager, BNI

The BNI Environmental, Safety, and Health Manager (ES&H) Manager is responsible for:

- Providing technical support/information with respect to the safety-related aspects of this Procedure

NOTE: *The BNI ES&H Manager will fulfill responsibilities of the Fire protection program manager (National Fire Protection Association [NFPA] 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations, Section 7.2.4) from a functional aspect and delegate those duties as appropriate.*

- Providing field support related to Fire prevention and protection measures identified in this Procedure
- Acting as the point of contact for all issues or concerns during the construction process, including transfer to Startup ownership

2.4 BNI Fire Protection Engineer

The BNI Fire Protection Engineer (FPE) is responsible for:

- Providing support to the lead Fire investigator as requested
- Providing technical support related to Fire protection and prevention issues, construction work practices, life safety requirements, hazard evaluations, and compliance with applicable codes and standards
- Developing and tracking compensatory measures when an active system or egress path must be changed, modified, or otherwise impaired
- Determining Fire protection and prevention measures required for building or partial building occupancy
- Coordinating with the Design Authority-Fire Protection and/or the Contractor Authority Having Jurisdiction (CAHJ) any items in which an interpretation is required concerning Fire protection/prevention or compensatory measures

2.5 Design Authority Fire Protection Representative

The Design Authority Fire Protection Representative serves as the point of contact for the CAHJ. The Design Authority Fire Protection Representative performs the CAHJ delegated activities/responsibilities as permitted by COL-NNSA-NPO-PM-801768-A281, *Delegation of Fire Protection Authority Having Jurisdiction Responsibilities for the Pantex Plant and Y-12 National Security Complex*.

The Design Authority Fire Protection Representative is responsible for interpreting Fire protection codes and standards in accordance with the above delegation letter and with PL-RM-801768-A001, *UPF Design Code of Record*.

2.6 Construction Distributables Manager

The Construction Distributables Manager (hereinafter referred to as Construction Distributables Manager) is responsible for:

- Ensuring Fire extinguishers are provided, properly maintained, and inspected
- Maintaining a sufficient supply of Fire extinguishers and providing a means to inventory them (refer to **Section 4.4, Portable Firefighting Equipment**)

2.7 Discipline Superintendent/Facility Test Lead

The Discipline Superintendent/Facility Test Lead is responsible for implementing requirements identified in this Procedure on the UPF construction site and supporting areas, including:

- Planning work activities to identify potential hazards and taking the appropriate steps to mitigate those hazards
- Monitoring site conditions daily and implementing remedial actions as required

2.8 Supervisor/Discipline Test Lead

The Supervisor/Discipline Test Lead is responsible for:

- Ensuring unsafe conditions or behaviors are corrected/controlled
- Addressing housekeeping, access/egress, and storage and staging of materials in accordance with this Procedure
- Monitoring site conditions daily and implementing remedial actions as required

3.0 EMERGENCY RESPONSE

3.1 Fire Occurrence

In the event of a Fire, personnel are primarily responsible for evacuating themselves and others safely from the Fire area. The discoverer of the Fire shall perform or direct the following three immediate actions:

Step 1 Yell "FIRE" to notify those in the immediate vicinity.

Step 2 Notify the Y-12 National Security Complex (Y-12) Operations Center (OC) by:

- Activating a Fire alarm (pull box), if available
- Calling 911 from a Y-12 landline
- Calling Y-12 OC at (865) 574-7172 from a cell phone
- Contacting the OC via Channel 1 from a Project radio
- Contacting the supervisor/superintendent and providing any information regarding the Fire and its location (to be forwarded to the Y-12 OC)

NOTE 1: *Use the phonetic alphabet when calling the OC to avoid confusion identifying the building location.*

Step 3 Only after reporting the Fire, personnel may voluntarily attempt to fight a small, early-stage Fire using an available portable Fire extinguisher. This voluntary action should be taken only if personnel believe it is within their capability to safely extinguish or contain the Fire, a safe escape route is readily available, and there is no immediate danger.

NOTE 2: *Signage is provided throughout the construction site(s) to reinforce the above reporting steps.*

3.2 Fire Brigade

Emergency response and Firefighting capabilities are provided by the Y-12 Fire Department (FD). The Y-12 FD is a fully staffed and fully trained FD satisfying the Fire brigade requirements of NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations*.

3.3 Pre-Fire Plans

Pre-Fire plans for the UPF construction site(s) are developed and maintained by the Y-12 FD with input from UPF Project personnel.

The CNS ES&H Manager coordinates routine monthly site visits by the Y-12 FD to ensure pre-Fire plans are updated to account for changing site conditions.

For daily Operations that may impact FD response the following tools are available for communication with the FD; Startup Plan of the Day, Construction Plan of the Day, ES&H Daily Information Sheet.

3.4 Fire Investigations

All fire related incidents shall be promptly reported to the OC. Incidents determined to be a Fire by the CNS FPE shall be promptly investigated in accordance with Y79-001. Incidents determined to be a Fire by the Y-12 Fire Department Incident Commander shall be promptly investigated in accordance with Y79-001. Non-Fire events will be investigated in accordance with UPF-CP-108, *UPF Event Management and Investigation*. Once the incident commander from the Y-12 FD has secured the scene unauthorized entry shall be controlled, evidence shall be protected, and cleanup of the Fire scene shall be delayed, if possible, until after the Fire investigation has been completed. Cleanup or other minimal actions necessary to minimize hazardous conditions, protect personnel safety, or avoid environmental impact are allowed.

4.0 FIRE PROTECTION

4.1 Access to Buildings under Construction or Startup Control

MAINTAIN roadways for Fire apparatus access to each building or area, having:

- An all-weather driving surface
- At least 20 feet of unobstructed width

- A vertical clearance of a minimum of 13 feet, 6 inches
- The ability to withstand the loads of Firefighting apparatus

DO NOT OBSTRUCT the required width of the access roadway in any manner, including obstruction caused by parked vehicles.

POST and MAINTAIN No Parking signs, other appropriate notices, or both, prohibiting obstruction.

EXTEND access roadways to within 150 feet of all portions of exterior walls for the first story of any building.

BARRICADE or otherwise mark roadways that do not meet these requirements.

COMMUNICATE changes of established roadways to the Y-12 FD for inclusion in pre-Fire plans.

4.2 Access for Firefighting

MAINTAIN adequate escape facilities at all times in buildings under construction.

NOTE: *Escape facilities consist of doors, walkways, stairs, ramps, Fire escape ladders, or other Approved means or devices arranged in accordance with the general principles of the NFPA 101, Life Safety Code®.*

PROVIDE at least two lighted enclosed stairways in all buildings over one story in height, that is in usable condition, at all times with access to each floor.

POST all exit stairs with identification signs that include the floor level and stair designation.

MAINTAIN clear access to all available Firefighting equipment.

LOCATE Firefighting equipment so it is conspicuously located.

4.3 Means of Egress

- **ENSURE** the following egress requirements are met in every building and structure:
 - **ENSURE** at least two exits are provided that have unobstructed egress from all parts of the building or structure that discharge to a safe location
 - **ENSURE** exits are illuminated
 - **ENSURE** locks or fastenings that can prevent free escape from inside the building are not installed
 - **ENSURE** exits and travel paths to reach exits are marked with readily visible signs or other means of identification including exit path direction
 - **ENSURE** all exit stairs are provided with stair identification signs indicating floor level, stair designation, and exit path direction as required to provide for safe egress
 - Any door, passage, or stairway that is neither an exit nor a way of exit access and that is located or arranged so that it is likely to be mistaken for an exit shall be identified by a sign that reads as follows: NO EXIT.
 - The NO EXIT sign shall have the word NO in letters 2 in. (51 mm) high, with a stroke width of 3/8 in. (9.5 mm), and the word EXIT in letters 1 in. (25 mm)

high, with the word EXIT below the word NO, unless such sign is an approved existing sign.

- **ENSURE** signage for egress routes and direction is appropriately modified when exit routes change or when there is an impairment to the egress stairwells
- **MAINTAIN** means of egress free of all obstructions or impediments for use in case of Fire or other emergency

4.4 Portable Firefighting Equipment

ENSURE the following portable Firefighting equipment requirements are met, as applicable:

- **ESTABLISH** maps for each building under construction to identify portable Fire extinguisher placement, location, and type

NOTE: *Fire extinguisher maps are reviewed and Approved by the BNI FPE to ensure proper sizing and spacing of Fire extinguishers*

- **PROVIDE** one or more Fire extinguisher on each floor; in multistory buildings, locate at least one Fire extinguisher adjacent to each stairway
- **INSPECT** and **MAINTAIN** all portable Fire extinguishers in accordance with **Appendix B, Monthly Inspection and Annual Maintenance Fire Extinguisher Inspection Requirements**
- **MAINTAIN** portable Fire extinguishers, including vehicle mounted Fire extinguishers, in accordance with NFPA 10, *Standard for Portable Fire Extinguishers*
- **USE** only Fire extinguishers listed or Approved by a nationally recognized testing laboratory
- **PROVIDE** suitable portable Fire extinguishers on all self-propelled equipment
- **PROVIDE** and **MAINTAIN** at least one Approved extinguisher in an accessible location in each of the following:
 - Tool room
 - Storeroom
 - Dressing/change room
 - Workshop
- **REPLACE** Fire extinguishers **IMMEDIATELY** after discharge with another Fire extinguisher that is fully charged and of the proper size and type
- The Construction Distribs Manager, or delegate, will **MAINTAIN** a master list of all Fire extinguishers utilized on the Project
- Transient Fire extinguishers are issued through ToolHound electronic database (UCN-23356, *UPF Fire Extinguisher Check-Out Log*, may be used as a backup in the event ToolHound is unavailable). Fire extinguishers must be inspected monthly in accordance with Appendix B, Monthly Inspection and Annual Fire Extinguisher Examination Requirements

4.5 Fixed Firefighting Equipment

ENSURE the following fixed Firefighting equipment requirements are met, as applicable:

- IF the facility being constructed includes the installation of automatic sprinkler protection and standpipe systems, **THEN ENSURE** those systems are placed in service as soon practicable
- For facilities with interior standpipes, ensure standpipes are installed and properly maintained

MAINTAIN active systems in accordance with NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*; and NFPA 72, *National Fire Alarm and Signaling Code*®.

NOTE: Any system that is “active” or “live” has undergone turnover and is handled by Startup.

- **IF** the operational status to any active Fire protection system is changed, **THEN ENSURE** the following criteria are met:
 - **OBTAIN** authorization from the Startup Manager
 - **COMMUNICATE** the Impairment to the Y-12 FD
 - **IMPLEMENT** compensatory measures developed by the BNI FPE during the extent of the Impairment
- **IDENTIFY** active standpipes and other Fire protection devices
- **REMOVE** temporary protective coverings used on Fire protection devices during work (e.g., painting, welding) promptly when work is completed in the area

4.5.1 Hydrants

- **ENSURE** the remaining underground water mains and hydrants are completed and placed in service as soon as possible
- **PROVIDE** and **MAINTAIN** free access from the street to Fire hydrants and to outside connections for standpipes, sprinklers, or other Fire extinguishing equipment, whether permanent or temporary
- **IDENTIFY** out-of-service hydrants and Post Indicator Valves
- **DO NOT CONSTRUCT** protective pedestrian walkways so they impede access to hydrants
- **DO NOT INTERFERE** with access to hydrants, FD/Firehose connections, or Fire extinguishing equipment (e.g., material, construction equipment)
- Provide signage or flagging to indicate which hydrants are in service

4.6 Water Supply

ENSURE an adequate water supply for Fire protection, either temporary or permanent, is made available. The supply shall be capable of the volume, duration, and pressure required to operate fixed Firefighting equipment.

4.7 Fire Cutoffs

ENSURE the following Fire cutoff requirements are met, as applicable:

- **IF** the facility being constructed includes Fire walls, Fire doors, and exit stairways, **THEN ENSURE** the completion of those systems follows construction completion, and the systems are placed in service as soon practicable
- **MAINTAIN** active Fire doors in a closed position unless being used
- **IF** active Fire cutoffs must be changed or altered for any reason, **THEN ENSURE** the following criteria are met:
 - **OBTAIN** authorization from the BNI ES&H Manager
 - **COMMUNICATE** the Impairment to the Y-12 FD
- **IMPLEMENT** compensatory measures developed by the BNI FPE during the extent of the Impairment

5.0 FIRE PREVENTION

5.1 Impairments

5.1.1 Emergency Impairments

NOTE 1: *Contact the PSUM, or designee for assistance in the event of an Emergency Impairment.*

The PSUM, or designee, shall be responsible for verifying the following actions have been performed:

- Immediate notifications to stakeholders (below) via e-mail that an Emergency Impairment condition has occurred:
 - Y-12 Operations Center (OC) (Phone: 865-574-7172)
 - Alarm Monitoring Security Central (Phone: 800-286-5699)
 - Site Manager
 - BNI ES&H Manager
 - Design Authority Fire Protection Representative
 - BNI FPE
 - Y-12 FD (Alarm Room Officer Phone: 865-576-1890)
- UPF Fire Protection System Outage/Impairment/Deficiency Tag (refer to **Appendix C, UPF Fire Protection System Outage/Impairment/Deficiency Tag**), has been installed on the system indicating it has been removed from service
- When Emergency Impairments occur, emergency actions are taken to minimize potential injury and damage
- Compensatory measures (as needed) are established and documented on UCN-23486
- The area affected by the impairment is placed under continuous Fire Patrol until the impaired Fire Protection/Detection System has been returned to service. The interval selected for the Fire Patrol shall be commensurate with the severity of the hazard being mitigated up to potentially being a continuous fire watch, until the affected system is returned to service

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- All hazardous activities have been stopped until they have been reviewed by the BNI ES&H Manager and Approved for resumption
- Impairment has been documented, including corrective actions taken in the UCN-23486 (Impairment number consists of the year and a subsequent number):
 - The **PSUM** or designee **SHALL** issue project wide notice regarding the impairments, expected duration, and corrective actions implemented

UCN-23487, *Fire Protection System Impairment Request*, is to be completed and routed **AFTER** the Emergency Impairment has been implemented. Steps outlined within Section 5.1.2, *Preplanned Impairments*, are to be implemented after the steps within Section 5.1.1, *Emergency Impairments*, are performed.

5.1.2 Preplanned Impairments

NOTE: *The impairing of Fire Protection/Detection Systems to reduce the need to manage work interfaces is not an appropriate risk management and does not meet regulatory requirements.*

All Impairments **SHALL** be authorized through UCN-23487.

The Requester will notify the following before Fire protection systems are impaired:

- PSUM
- Site Manager
- BNI ES&H Manager
- BNI FPE
- Design Authority Fire Protection Representative
- Y-12 FD (Alarm Room Officer Phone: 865-576-1890)
- Y-12 OC (Phone: 865-574-7172)
- Alarm Monitoring Security Central (Phone: 800-286-5699)

The **PSUM**, or designee **SHALL** issue project-wide notifications when issuing an impairment with the expected duration and compensatory measures implemented.

Before authorization is given, the **PSUM**, or designee, **SHALL** be responsible for verifying the following has been implemented:

- Extent and expected duration of the Impairment have been determined
- Areas or buildings involved have been inspected and the increased risks determined and documented on UCN-23487
- Recommendations to mitigate any increased risks have been submitted to management
- If applicable, assemble all necessary tools and materials on the Impairment site
- Where a Fire Protection/Detection system is out of service, the **PSUM** or designee **SHALL** arrange for compensatory measures and may include the following:
 - Evacuation of the building or portion of the building affected by the system out of service
 - Fire patrol plan
 - Limited facility operations

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- Establishment of a Temporary Water Supply
- Establishment and implementation of an Approved program to eliminate potential ignition sources, and to limit the amount of fuel available
- If applicable, assemble all necessary tools and materials on the Impairment site
- Notification of the Y-12 FD to determine if additional compensatory measures are required for Fire response

Document the Impairment on UCN-23486.

INSTALL UPF Fire Protection System Outage/Impairment/Deficiency Tag refer to **Appendix C**) and ensure tag is documented on the UCN-23487 to indicate that the system has been removed from service.

The **PSUM**, or designee, **SHALL** post signage, in accordance with UPF-CP-214, *Barricades and Signs*, on all entrances to the building with the impaired system. The **PSUM** or designee, **SHALL** ensure the means of egress posting requirements outlined in Section 4.3 of this Procedure are satisfied.

5.1.3 Fire Patrol

The Fire Patrol shall have no other collateral assignments. The Fire Patrol's only responsibility is to monitor the status of the building. The Fire patrol shall be provided with a means to be able at all times to communicate with the OC and/or the FD.

UCN-23488 or equivalent means of documenting the completion of rounds **SHALL** be used for each Impairment.

Fire patrol for Impairments shall default to a continuous Fire watch, 24/7 in all areas impacted by the Impairment, unless an interval for Fire patrol is defined as a comp measure in an Approved impairment request, UCN-23487. If the affected area is of the size preventing the Fire patrol to make the rounds in a reasonable time (i.e., no more than 30 minutes per round), then multiple Fire patrol personnel will be utilized.

If a FIRE is **DETECTED**, perform the steps detailed in **Section 3.1, Fire Occurrence**.

Remain on Fire patrol rounds until one of the following occurs:

- Relieved from duty by another Fire patrol
- Notified by the PSUM, or designee, that Fire patrol is no longer required

The Fire Patrol Log used by the Fire Patrol personnel is to be turned into the Fire Impairment Requester when completed.

5.1.4 System Restoration

NOTE: *The appropriate NFPA codes and standards shall be consulted on the type of test or inspection required.*

When restoring impaired equipment to normal working order, the PSUM or designee shall verify the following steps have been implemented before closing the Impairment in Process Director or on the UCN-23486:

- **INSPECT** and **TEST** to verify the affected systems are operational

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- **ENSURE** the impaired equipment is returned to operational status, as appropriate
- **ENSURE** the UPF Fire Protection System Outage/Impairment/Deficiency Tag(s) (refer to **Appendix C**) has been removed
- Notify the following the Impairment has been **RESTORED**:
 - PSUM
 - Site Manager
 - BNI ES&H Manager
 - Design Authority Fire Protection Representative
 - Y-12 FD (Alarm Room Officer Phone: 865-576-1890)
 - Y-12 OC (Phone: 865-574-7172)
 - Alarm Monitoring Security Central (Phone: 800-286-5699)
 - BNI FPE
- The **PSUM** or designee **SHALL** issue project-wide communications that impairments and compensatory measures implemented have been **RESTORED**

Compile the following and submit to the Document Management Center (DMC):

- UCN-23487, *Fire Protection System Impairment Request*
- UCN-23486, *Fire Protection Impairment Log*

5.2 Fire Safety Monitor

To further reduce the risk of fire and loss of property, the Project implements a continuous fire safety monitor program to perform monitoring of the construction site until the activation of the fire sprinkler systems. The fire safety monitor program includes utilization of construction staff during on-shift hours and security service personnel during the off-shift. All personnel will be instructed on the methods to and provided with a means to contact the Y-12 Fire Department for emergency events and the BNI ES&H manager for non-emergency events.

Continuous fire safety monitoring will take place 7 days per week, whenever normal construction work is not being performed in the buildings, including after-hours, weekends, and holidays.

The fire safety monitor shall have no other collateral assignments. The fire safety monitor during off-shift will monitor the site for compliance with UPF-CP-211, be trained in emergency response protocols, and be knowledgeable of the changing response conditions (i.e., roadways).

If the affected area is of the size preventing the fire safety monitor to make the rounds in a reasonable time (i.e., no more than 30 minutes per round), then multiple fire safety monitor personnel will be utilized.

UCN-23488 or equivalent means of documenting the completion of rounds **SHALL** be used for Fire Safety Monitoring.

5.3 Hot Work

REFER TO Y17-95-64-877, *UPF Hot Work Permit*, for Fire protection and prevention measures during welding, cutting, and Hot Work.

5.4 Ignition Hazards

HANDLE ignition hazards as follows:

- **INSTALL** electrical wiring and equipment for light, heat, or power purposes in accordance with UPF-MANUAL-CM-001, *Uranium Processing Facility Construction Electrical Safety Manual*
- **DO NOT SMOKE** unless in a designated smoking area in accordance with UPF-POLICY-CM-004, *UPF Smoking/Tobacco Use Policy*
- **LOCATE** exhausts of internal combustion engine-powered equipment away from Combustible materials

5.5 Construction Material and Equipment Staging

It **SHALL** be permissible to stage incidental piece parts contained in cardboard cartons when stored in closable metal cabinets (i.e., clam shell cabinets) or when properly protected and covered by project-approved fire blanket or equipment. Exceptions to these requirements must be evaluated by the FPE and approved by the CAHJ or designee.

WHEN equipment to be installed is staged in unprotected structures under construction, protect the associated Combustible construction and packing materials by covering it with a project-approved fire blankets or equivalent.

Permanent storage shall not be permitted in structures until the Fire protection system is in service and authorized by the BNI ES&H Manager.

To the extent possible, materials used for temporary construction purposes inside of buildings/structures shall be of the Fire-resistive type.

Quantities of Combustible materials staged for imminent use inside buildings under construction shall not deviate from practices established by the BNI FPE and Approved by the CAHJ. This plan shall be monitored by walkdowns from the BNI Construction FPE and documented in weekly written reports.

MAINTAIN at least a 36-inch clearance between the top level of the stored material and the sprinkler deflectors.

DO NOT STORE material within 36 inches of a door opening.

5.6 Waste Disposal

REMOVE accumulations of Combustible waste material, dust, and debris at the end of each work shift or more frequently (as necessary).

DISPOSE of materials susceptible to spontaneous ignition (e.g., oily rags) in a listed disposal container.

Trash chutes shall be constructed of noncombustible materials or Fire retardant, and plans must be Approved by the CAHJ prior to use.

5.7 Scaffolding, Shoring, and Forms

ENSURE the following requirements for scaffolding, shoring, and forms are met:

- **PREVENT** the accumulations of unnecessary Combustible scaffold or form lumber
- **BRING** Combustible forms or lumber into a structure only when needed
- **REMOVE** Combustible forms or lumber from the structure as soon as stripping is completed

5.8 Temporary Buildings

DO NOT ERECT a Temporary Building within a building under construction unless Approved by the BNI FPE.

DO NOT erect or place a Temporary Building within the minimum separation distances required in **Table 1** from a building under construction or other permanent construction support structures, unless Approved in advance by the BNI FPE.

Table 1. Separation Distances

Temporary Structure Exposing Wall Length		Minimum Separation Distance	
M	Ft	M	ft
6	20	9	30
9	30	11	35
12	40	12	40
15	50	14	45
18	60	15	50
>18	>60	18	60

NOTE: *The separation distances apply to single-level structures only. This Table does not apply to multilevel, unsprinklered structures. A level, where applying this Table, is 3.6 m (12 ft).*

5.9 Temporary Enclosures

ENSURE only non-Combustible panels, flame-resistant tarpaulins, or Approved materials of equivalent Fire-retardant characteristics are used for Temporary Enclosures. The term “enclosures” also includes panels or materials used to protect equipment, such as dust covers or moisture protection.

EQUIP each Temporary Enclosure with a Fire extinguisher.

5.10 Data Vaults

Data Vaults can only be established with approval by BNI FPE. Data Vaults shall be posted with approval.

NOTE: *These requirements pertain to Data Vaults and other similarly equipped stations as determined by the FPE*

Data Vaults shall not be used for permanent occupancy and be used only for its intended purpose during construction.

Data Vaults shall be provided with noncombustible furniture and shall be provided with a Fire extinguisher.

5.11 Yard Storage

ENSURE yard storage meets the following criteria:

- **PILE** Combustible materials with due regard to the stability of the piles, but no higher than 20 feet
- **KEEP** the storage areas free from accumulation of unnecessary Combustible materials, keep weeds and grass down, and provide periodic cleanup of the entire area
- **DO NOT STORE** Combustible material outdoors within 30 feet of a building or structure
- **PROVIDE** portable Fire extinguishing equipment suitable for the Fire hazard involved at convenient, conspicuously accessible locations in the yard area

5.12 Flammable and Combustible Liquids

5.12.1 General Requirements

USE only project-approved storage cabinets, containers and Portable Tanks for storage and handling of Flammable and Combustible liquids.

USE only Approved safety cans or Department of Transportation-Approved containers for the handling and use of Flammable Liquids in quantities of five gallons or less. The only exception to this requirement is for Flammable liquid materials that are thick and highly viscous (extremely hard to pour), which may be used and handled in original containers.

DO NOT STAGE Flammable or Combustible liquids in areas used for exits, stairways, or areas normally used for the safe passage of people or within 35 feet of an exit.

5.12.2 Storage of Flammable and Combustible Liquids

Designated Flammable and Combustible liquid storage areas (bulk storage) outside of unprotected buildings **SHALL** be Approved by the BNI FPE. No Flammable or Combustible liquids may be stored inside unprotected buildings.

PROVIDE only Approved metal storage cabinets that meet the requirements of NFPA 30, *Flammable and Combustible Liquids Code*, 2012 Edition.

LABEL cabinets with conspicuous lettering "Flammable—Keep Fire Away."

LABEL portable bulk tanks and containers with the applicable NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*, placard.

LOCATE designated Flammable/Combustible liquid storage areas 50 feet or greater from unprotected buildings.

Hot Work or open flames **SHALL NOT** be allowed in Approved Flammable and Combustible liquid storage areas.

KEEP Approved Flammable and Combustible liquid storage areas free from weeds, debris, and Combustible materials not necessary to the storage.

NOTE: *Additional requirements for storage areas and inventory of hazardous materials is established in Y73-181PD, Hazardous Materials Management Program.*

5.12.3 Handling at the Point of Final Use

NOTE: *The NFPA Glossary of Terms defines “Handling” as “The deliberate movement of material by any means to a point of storage or use”.*

Class I and Class II liquids shall be kept in Approved safety containers.

Means shall be provided to dispose of leakage and spills promptly and safely.

Flammable and Combustible liquids shall be handled only where there are no open flames or other sources of ignition within the possible path of vapor travel.

Flammable and Combustible liquids shall be kept in closed tanks or containers when not actually in use.

Class I liquids (or Class II and Class III liquids that are heated up to or above their flash points) shall be drawn from or transferred into vessels or containers as follows:

- From original shipping containers with a capacity of five gallons or less
- From project-approved dispensing device (i.e., plunger cans)

ENSURE adequate natural or mechanical ventilation is provided in the area of operation.

NOTE: *Industrial Hygiene ventilation requirements for the protection of personnel are more restrictive than ventilation requirements pertaining to fire protection and prevention (i.e., maintaining concentrations below 25% of the LFL vs. maintaining concentrations below the OELs). The applicable Job Hazard Analysis (JHAs) and Safety Data Sheet (SDS) Evaluation Forms outline the work controls necessary during the handling of flammable and combustible liquids.*

5.12.4 Refueling Activities

ENSURE only Approved vehicles are used for refueling activities.

ENSURE portable fuel cells/tanks comply with NFPA 30 and are UL Research Institutes listed to include the dispensing hose and nozzle. **IF** fuel cells/tanks are required to be lifted, **ENSURE** the tank is rated and Approved for hoisting.

SHUT OFF the motors of all equipment being refueled before refueling operations begin.

If pumps are used to refuel, **THEN ENSURE** they are provided with automatic shut-off.

DO NOT refuel vehicles and/or portable equipment in buildings under construction.

PROVIDE adequate spill preventing and control means.

5.12.5 Flammable and Combustible Gases

REFER TO UPF-CP-225, *Compressed Gas Cylinders, Liquefied Petroleum Gas, and Liquefied Inert Gases*, for handling liquefied petroleum gas and other Flammable or Combustible gasses.

5.13 Temporary Heating Devices

ENSURE the following requirements for temporary heating devices are met:

- **SUPPLY** fresh air in sufficient quantities to maintain the health and safety of workers

NOTE: *Contact industrial hygiene to specify the ventilation requirements when setting up temporary heating devices that can impact the indoor air.*

- **ENSURE** temporary heating devices are installed to provide a 36-inch clearance to all material, unless otherwise specified by the manufacturer
- **ENSURE** heaters used in the vicinity of tarpaulins or similar sheet material are located at least 10 feet from the coverings, and the covering is securely fastened to prevent ignition or upsetting the heater as a result of wind or severe weather
- **ENSURE** heaters, when in use, are set horizontally level unless otherwise permitted by the manufacturer's markings
- **DO NOT USE** solid fuel salamanders or temporary heating equipment using exposed radiant heating wires
- **ENSURE** Flammable liquid-Fired heaters are equipped with a primary safety control to stop the flow of fuel in the event of flame failure. Barometric or gravity oil feed is not considered a primary safety control
- **ENSURE** heaters designed for barometric or gravity oil feed are used only with integral tanks

USE and **MAINTAIN** temporary heating equipment in accordance with the manufacturer's instructions.

- **ENSURE** portable heaters, regardless of fuel source, are equipped with an Approved automatic device to shut off the flow of gas to the main burner and pilot, if used, in the event of flame failure
- **ENSURE** heaters having inputs above 50,000 Btu per hour are equipped with either a pilot, which must be lighted and proved before the main burner can be turned on, or an electrical ignition system
- **ENSURE** fuel supplies for liquefied petroleum gas-Fired heaters comply with NFPA 54, *National Fuel Gas Code*; and NFPA 58, *Liquefied Petroleum Gas Code*
- **ENSURE** heating devices are secured and immobile during operation
- Temporary Construction HVAC shall be designed to maintain the temperature in the buildings under construction above freezing until the permanent HVAC systems are installed and commissioned

6.0 FIRE PREVENTION/PROTECTION SELF-INSPECTIONS

Project personnel can perform and document informal observations utilizing Chekhov supporting the leadership engagement efforts. Formal assessments (i.e., UPF project personnel assessing the implementation of CP-211) will be performed on a predetermined schedule in accordance with Y60-95-803, *UPF General Assessments*. The triennial programmatic assessments will be performed in accordance with E-SD-2004.

7.0 WORK PHASE TRANSITION/HAZARD ANALYSIS

As the work phases transition in each facility/building (i.e., construction to startup), the changes in the hazards will be evaluated by the PSUM and FPE to determine additional Fire prevention controls and practices, including:

- Fire protection systems
- Fire detection and communication
- Life safety and egress
- Y-12 FD response and access
- Housekeeping and control of Combustibles
- Control of ignition sources
- Rapid Communication
- Consideration of special hazards
- Protection of existing structures and equipment from exposure Fires

8.0 RECORDS

Records generated by this Document shall be maintained in accordance with Y15-95-800, *UPF Document Management*.

The following records are generated:

Record or Form Number	Record Title	System/Location	Document Type
UCN-23486	<i>Fire Protection Impairment Log Or equivalent means of documentation (i.e.,</i>	InfoWorks	FPS
UCN-23487	<i>Fire Protection System Impairment Request</i>	InfoWorks	FPS
UCN-23488	<i>Fire Patrol Patrol/Safety Monitoring Log (equivalent method of documentation such as Watchman are permissible)</i>	InfoWorks	FPL
Document Specific	<i>ToolHound Fire Extinguisher Final Report (UCN-23356 may be used in the event ToolHound is unavailable)</i>	InfoWorks	RP

9.0 REFERENCES

9.1 Source References

10 CFR 851, *Worker Safety and Health Program*

29 CFR 1926, Subpart F, *Fire Protection and Prevention*

Bechtel Core Process 211 2HC-E0S0-00211-000, *Fire Prevention and Protection*

E-SD-2004, Fire Protection Program

E-SD-2009, Integrated Safety Management Program - Incorporating Worker Safety and Health Program Requirements

NFPA 13, *Standard for the Installation of Sprinkler Systems*

NFPA 70, *National Electrical Code*®

9.2 Interfacing References

COL-NNSA-NPO-PM-801768-A281, *Delegation of Fire Protection Authority Having Jurisdiction Responsibilities for the Pantex and Y-12 National Security Complex*

DOE-STD-1066-2012, *Fire Protection*

E-SD-2004, Fire Protection Program

NFPA 10, *Standard for Portable Fire Extinguishers*

NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*

NFPA 30, *Flammable and Combustible Liquids Code*

NFPA 54, *National Fuel Gas Code*

NFPA 58, *Liquefied Petroleum Gas Code*

NFPA 72, *National Fire Alarm and Signaling Code*®

NFPA 101, *Life Safety Code*®

NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations*

NFPA 251, *Standard Methods of Tests of Fire Resistance of Building Construction and Materials*

NFPA 704, *Standard System for the Identification of the Hazards of Materials for Emergency Response*

PL-RM-801768-A001, *UPF Design Code of Record*

ROD-CM-801768-A006, *Record of Decision BNI Direct Hire to Perform Annual External Examination of UPF Fire Extinguishers*

UPF-CP-108, *UPF Event Management and Investigation*

UPF-CP-214, *Barricades and Signs*

UPF-CP-225, *Compressed Gas Cylinders, Liquefied Petroleum Gas, and Liquefied Inert Gases*

UPF-CP-227, *UPF Safety Watches*

UPF-MANUAL-CM-001, *Uranium Processing Facility Construction Electrical Safety Manual*

UPF-POLICY-CM-004, *UPF Smoking/Tobacco Use Policy*

Y15-95-800, *UPF Document Management*

Y17-95-64-877, *UPF Hot Work Permit*

Y60-95-015, *Uranium Processing Facility Software Quality Assurance*

Y60-95-803, *UPF General Assessments*

Y73-181PD, *Hazardous Materials Management Program*

Y79-001, *Y-12 Fire Protection Program Manual*

9.3 Forms

UCN-23356, *UPF Fire Extinguisher Check-Out Log*

UCN-23486, *Fire Protection Impairment Log*

UCN-23487, *Fire Protection System Impairment Request*

UCN-23488, *Fire Patrol Log*

10.0 SUPPLEMENTAL INFORMATION

Appendix A, *Acronyms and Definitions*

Appendix B, *Monthly Fire Extinguisher Inspection Requirements*

Appendix C, *UPF Fire Protection System Outage/Impairment/Deficiency Tag*

APPENDIX A Acronyms and Definitions

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Acronyms

BNI - Bechtel National, Inc.	6
CAHJ - Contractor Authority Having Jurisdiction	7
CNS - Consolidated Nuclear Security	6
DMC - Document Management Center	16
ES&H - Environmental, Safety, and Health Manager	7
FD - Fire Department	9
FPE - Fire Protection Engineer	7
HMIS -Hazard Material Information System	28
NFPA - National Fire Protection Association	7
OC - Operations Center	8
OC - Y-12 Operations Center	13
PSUM - Project Startup Manager	6
UPF - Uranium Processing Facility	6
Y-12 - Y-12 National Security Complex	8

Definitions

Annual	Once per calendar year.
Approved	For the purpose of this Procedure, equipment that has been listed or Approved by a nationally recognized testing laboratory that issues approval for such equipment.
Closed Container	A container so sealed by means of a lid or other device that neither liquid nor vapor will escape from it at ordinary temperatures.
Combustible	Any liquid having a flash point at or above 140° F and below 200° F.
Designated Flammable and Combustible	Any area Approved by BNI FPE utilized for the storage of Flammable and Combustible liquids in excess of incidental use quantities.
Emergency Impairment	A condition where a water-based Fire protection system or portion thereof is out of order because of an unexpected occurrence (i.e., ruptured pipe, operated sprinkler, interruption of the water supply to the system).

APPENDIX A Acronyms and Definitions

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Fire	Unplanned destructive and uncontrolled burning, including detonation and deflagration, as manifested by any or all of the following: flame, heat, or smoke. Fire does not include the following events unless they cause a Fire or occur as a consequence of the event: lightning or electrical discharge; rupture of a pressure vessel not caused by internal combustion; detonation of munitions; overheating (without damage to initiating material); or failure of electric motors and other electrical equipment through overheating and shorting where any visible sparks or flames self-extinguish after power is removed from the device.
Fire Resistance	Resistant to Fire such that, for specified time and under conditions of standard heat intensity, will not fail structurally and will not permit the side furthest from the Fire to become hotter than a specified temperature. For purposes of this Procedure, Fire Resistance is determined by NFPA 251, <i>Standard Methods of Tests of Fire Resistance of Building Construction and Materials</i> .
Flammable	Capable of being easily ignited and burning intensely or rapidly.
Flammable Liquids	Any liquid having a flash point below 140° F and having a vapor pressure not exceeding 40 pounds per square inch (absolute) at 100° F.
Hot Work	Work involving burning, welding, grinding, or a similar operation that is capable of initiating Fires or explosions (Does not include the use of electric heat guns, electric soldering irons, or cutting tools that result in an unintentional spark) Work involving burning, welding, grinding, or a similar operation that is capable of initiating Fires or explosions (Does not include the use of electric heat guns, electric soldering irons, or cutting tools that result in an unintentional spark)
Hot Work Area	Encompasses the area defined by the 35-Foot Rule or modified by the PAI. (Does not include the use of electric heat guns, electric soldering irons, or cutting tools that result in an unintentional spark)
Portable Tank	A Closed Container having a liquid capacity more than 60 gallons and not intended for fixed installation.
Preplanned Impairment	A condition where a water-based Fire protection system or a portion thereof is out of service because of work that has been planned in advance, such as revisions to the water supply or sprinkler system piping.
Temporary Building	Construction-related structures, such as offices, trailers, sheds, or other facilities for the storage of tools and materials intended to remain throughout the construction phase.
Temporary Enclosure	A structure erected to protect equipment/material or support the completion of a construction work task (e.g., welding, coatings application). Typical enclosure types include tents and other membrane-covered structures (e.g., scaffolding).

APPENDIX B

Monthly Inspection and Annual Fire Extinguisher Examination Requirements

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Monthly Fire Extinguisher Inspection Requirements

Monthly visual inspections shall be performed on each portable Fire extinguisher and the tag shall be marked/punched to denote the passed inspection. Any deficiencies shall be corrected on the spot. Damaged or defective Fire extinguishers shall be tagged, removed from service, and replaced with an equivalent operable unit.

Monthly Fire extinguisher inspections requirements are as follows:

Present and Secured	A Fire extinguisher is provided at each location designated by the inventory list.
Accessible	The Fire extinguisher is accessible with an area provided around the extinguisher to allow access to the extinguisher. Also, trash is not placed on or in any component of the Fire extinguisher or blocking access to the extinguisher.
Identification	Permanently installed extinguisher locations are marked with a placard that is mounted above the extinguisher or cabinet and is clearly visible.
Seal Intact	Each pressurized portable Fire extinguisher is provided with a plastic seal. The seal must be intact and not broken to ensure the extinguisher has not been discharged.
Pressure or Volume is Adequate	For extinguishers with a pressure gauge, the needle indicator is within the operable range or position.
Damage	The Fire extinguisher appears in good condition with no obvious physical damage, corrosion, leakage, or clogged nozzle.
Tagged	Check the extinguisher tag to confirm the monthly inspection and Annual maintenance has been completed. Verification dates on the tag shall include the calendar year.

Annual External Examination of UPF Fire Extinguishers

BNI personnel designated to perform the Annual external examinations of portable Fire extinguishers will be briefed, tested, and certified on the examination procedure and requirements in accordance with NFPA 10 and as Approved by the UPF Fire Protection DAR in ROD-CM-801768-A006, *BNI Direct Hire to Perform Annual External Examination of UPF Fire Extinguishers*. PowerBI will be utilized to generate and maintain a report/list of all BNI personnel that are designated to complete the Annual external examination of UPF Fire Extinguishers.

- Annual external examinations will be conducted by BNI within the calendar year for all portable Fire extinguishers with a date of manufacture of the previous year or older
- Annual external examination attributes shall comply with NFPA 10, Section 7.3.2:
 - The Fire extinguisher appears in good condition with no obvious physical damage, corrosion, or clogged nozzle
 - Operating instructions are present, legible, and facing forward

APPENDIX B

Monthly Inspection and Annual Fire Extinguisher Examination Requirements

(Page 2 of 2)

- The Hazard Material Information System (HMIS) information is present and legible
- Determine if a the 6-year internal examination or 12-year hydrostatic test is due in accordance with NFPA 10, Table 7.3.3.1
- Remove the tamper seal by operating the pull pin
- Install a new tamper seal
- Damaged or defective Fire extinguishers shall be tagged, removed from service, and replaced with operable extinguishers of the same size and type
- Affix a tag securely to the Fire extinguisher indicating that external examination was successful. Annual examination Tags will be UCN-16673 or similar, to comply with NFPA 10 Section 7.3.4.1.1
- The dates the Annual external examinations were performed will be documented and tracked in ToolHound
- When a portable Fire extinguisher meets the criteria of requiring an internal examination in accordance with NFPA 10, Section 7.3.3, or a hydrostatic test in accordance with Section 8.3.1, the extinguisher will be turned over to the Y-12 Fire Department for action

APPENDIX C

UPF Fire Protection System Outage/Impairment/Deficiency Tag

UPF FIRE PROTECTION SYSTEM OUTAGE/IMPAIRMENT/DEFICIENCY TAG	
NUMBER	DATE/TIME
ISSUE TYPE <input type="checkbox"/> PLANNED OUTAGE <input type="checkbox"/> IMPAIRMENT <input type="checkbox"/> DEFICIENCY	
BUILDING / LOCATION	
SYSTEM COMPONENT NAME	
SYSTEM COMPONENT UNID	
OUTAGE / IMPAIRMENT / DEFICIENCY DESCRIPTION	
COMPENSATORY MEASURE <input type="checkbox"/> YES <input type="checkbox"/> NO	
APPLIED BY: NAME / BADGE #	VERIFIED BY: NAME / BADGE #
ATTACH TO AFFECTED SYSTEM / COMPONENT	

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