SALT WASTE PROCESSING FACILITY

FIRE DETECTION/PROTECTION

SYSTEM DESCRIPTION

S. J. Amendola, Jr.
SWPF Cognizant Fire Protection System Lead

William Bayne Brasel ORC96176.Auth
Digitally signed by William Bayne Brasel ORC96176.Auth
Date: 2019.07.15 13:30:15 -04'00'

Bill Brasel
SWPF Engineering Integration Manager

Dr. Thomas D. Burns, Jr., P.E.
SWPF Director of Engineering

07.15.19
Date

Bill Brasel
SWPF Engineering Integration Manager

7/15/19
Date

This Document Affected By

<table>
<thead>
<tr>
<th>Design Change Document</th>
<th>Initial/Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### SUMMARY OF CHANGES

<table>
<thead>
<tr>
<th>Revision No.</th>
<th>Date</th>
<th>Description of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10/30/2009</td>
<td>Initial Issuance.</td>
</tr>
<tr>
<td>1</td>
<td>02/25/2015</td>
<td>Revise per DCN-1463.</td>
</tr>
<tr>
<td>2</td>
<td>03/24/2015</td>
<td>Administrative Revision to change signature page in accordance with PP-EN-5017, <em>Development and Maintenance of System Descriptions</em>.</td>
</tr>
<tr>
<td>3</td>
<td>07/15/2019</td>
<td>Revise per DCN-1934, 1812, 7015, and DCN-2200.</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS

1.0 SCOPE ............................................................................................................................... 2

2.0 GENERAL OVERVIEW .................................................................................................... 3

2.1 Process Building Fire Protection ..................................................................................... 4
2.2 Process Building Fire Detection and Alarm Signaling ...................................................... 5
2.3 Compressor Building Fire Protection .............................................................................. 6
2.4 Diesel Generator Building Fire Protection ..................................................................... 6
2.5 Administration Building Fire Protection ......................................................................... 6
2.6 NGS Building Fire Protection ......................................................................................... 7
2.7 J Area Warehouse Building Fire Protection ................................................................... 7
2.8 Yard Fire Protection ......................................................................................................... 7

3.0 PROCESS BUILDING FIRE PROTECTION .................................................................. 8

3.1 System Functions ............................................................................................................. 8
3.1.1 Functional Classification ............................................................................................ 8
3.2 Operational Overview ..................................................................................................... 8
3.3 Configuration Information ............................................................................................... 9
3.3.1 Description of System .................................................................................................. 9
3.3.2 Major Components ...................................................................................................... 11
3.3.3 Physical Location and Layout .................................................................................... 13
3.3.4 System Control Features and Interlocks ................................................................. 23
3.3.5 Smoke Control Features ............................................................................................ 24
3.3.6 System Testing ........................................................................................................... 25
3.3.7 Operations .................................................................................................................. 25
3.3.8 Initial Configuration ................................................................................................... 25
3.3.9 System Startup .......................................................................................................... 25
3.3.10 Normal Operations .................................................................................................. 25
3.3.11 Off-Normal and Recovery Operations .................................................................... 26
3.3.12 System Shutdown ..................................................................................................... 26
3.3.13 Administrative and Compensatory Controls ......................................................... 26

4.0 REFERENCES .................................................................................................................. 27

LIST OF TABLES

Table 3-1. NFPA Code of Record ......................................................................................... 27
## ACRONYMS AND ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFF</td>
<td>Alpha Finishing Facility</td>
</tr>
<tr>
<td>AHU</td>
<td>Air Handling Unit</td>
</tr>
<tr>
<td>ANSI</td>
<td>American National Standards Institute</td>
</tr>
<tr>
<td>ASP</td>
<td>Alpha Strike Process</td>
</tr>
<tr>
<td>CCA</td>
<td>Cold Chemicals Area</td>
</tr>
<tr>
<td>CSSX</td>
<td>Caustic-side Solvent Extraction</td>
</tr>
<tr>
<td>DACT</td>
<td>Digital Analog Communications Transmitter</td>
</tr>
<tr>
<td>DOE</td>
<td>U.S. Department of Energy</td>
</tr>
<tr>
<td>EPC</td>
<td>Engineering, Procurement, and Construction (Contractor)</td>
</tr>
<tr>
<td>FACP</td>
<td>Fire Alarm Control Panel</td>
</tr>
<tr>
<td>FDC</td>
<td>Fire Department Connection</td>
</tr>
<tr>
<td>FHA</td>
<td>Fire Hazards Analysis</td>
</tr>
<tr>
<td>FP</td>
<td>Fire Protection</td>
</tr>
<tr>
<td>FSA</td>
<td>Facility Support Area</td>
</tr>
<tr>
<td>HAZOP</td>
<td>Hazard and Operability Review</td>
</tr>
<tr>
<td>HEPA</td>
<td>High-Efficiency Particulate Air</td>
</tr>
<tr>
<td>HVAC</td>
<td>Heating, Ventilating, and Air Conditioning</td>
</tr>
<tr>
<td>ICD</td>
<td>Interface Control Document</td>
</tr>
<tr>
<td>NFPA</td>
<td>National Fire Protection Association</td>
</tr>
<tr>
<td>NGS</td>
<td>Next Generation Solvent</td>
</tr>
<tr>
<td>OS&amp;Y</td>
<td>Outside Stem and Yoke</td>
</tr>
<tr>
<td>PBVS</td>
<td>Process Building Ventilation System</td>
</tr>
<tr>
<td>P&amp;VG</td>
<td>Pump and Valve Gallery</td>
</tr>
<tr>
<td>PMVS</td>
<td>Pulse Mixer Ventilation System</td>
</tr>
<tr>
<td>PVVS</td>
<td>Process Vessel Ventilation System</td>
</tr>
<tr>
<td>SRS</td>
<td>Savannah River Site</td>
</tr>
<tr>
<td>SRSOC</td>
<td>SRS Operations Center</td>
</tr>
<tr>
<td>SWPF</td>
<td>Salt Waste Processing Facility</td>
</tr>
<tr>
<td>UDACT</td>
<td>Universal Digital Analog Communications Transmitter</td>
</tr>
<tr>
<td>WTE</td>
<td>Waste Transfer Enclosure</td>
</tr>
</tbody>
</table>
## DEFINITIONS/GLOSSARY

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet Pipe Sprinkler System</td>
<td>Wet pipe fire sprinklers constantly contain water. This allows for a quick reaction to a fire and is the most common type of sprinkler installed in buildings. This type of fire sprinkler system is cost efficient and low maintenance.</td>
</tr>
<tr>
<td>Pre-Action Sprinkler System</td>
<td>Pre-action fire sprinkler systems are filled with air and water is allowed to pass through when the smoke alarm or detector goes off. This type of system requires two triggers to start water flow. It helps greatly that the pre-action fire sprinkler can be set to prevent water from discharging in case of a false alarm or a mechanical failure. The pre-action system is used in areas where the sprinklers are only necessary when there is an actual fire so other equipment in the building does not get water damage from an accidental actuation.</td>
</tr>
<tr>
<td>Dry Pipe Sprinkler System</td>
<td>Dry pipe sprinklers are similar to pre-action systems. A dry pipe sprinkler system is one in which pipes are filled with pressurized air or nitrogen, rather than water. This air holds a remote valve, known as a dry pipe valve, in a closed position.</td>
</tr>
<tr>
<td>Deluge Sprinkler System</td>
<td>A deluge fire sprinkler system is similar to a pre-action system except the sprinkler heads are open and the pipe is not pressurized with air. Deluge systems are connected to a water supply through a deluge valve that is opened by the operation of smoke, or heat detection system or by manual pull stations.</td>
</tr>
<tr>
<td>Test-and-Drain® Valve</td>
<td>A specialty valve used for system testing that is a 3 way ball valve with 3 positions: off, test, and drain. The off position does not allow any flow through the valve. The test position has an orifice the size of one sprinkler head nozzle (typically ½”). When in the test position, it simulates the flow of water through one sprinkler head to test the sensitivity of the flow switch. When in the drain position, the valve is in the full open position. Sometimes a small relief valve is included in the assembly to relieve pressures over 175 psi.</td>
</tr>
<tr>
<td>Inspector’s Test Connection</td>
<td>A valve (ball or gate) and orifice (the size of a sprinkler head nozzle, typically ½”) combination used to simulate the</td>
</tr>
</tbody>
</table>
flow of 1 sprinkler head to test the sensitivity of the flow switch. This combination is used in testing the system.

### Fire Alarm Control Panel
A component of the fire alarm system, provided with primary and secondary power sources, which receives signals from initiating devices or other fire alarm control units, and processes these signals to determine part or all of the required fire alarm system output function.

### Addressable Fire Alarm System
A fire alarm system made up of a series of initiation devices that are connected to a Fire Alarm Control Panel (FACP). With addressable systems, each initiation device has an address or location, enabling the exact device that was triggered to be quickly identified at the FACP. This type of panel allows for the use of different types of initiation devices on the same circuit. Notification devices can be addressable, but in the case of SWPF, they are not.

### Initiation Device
A device that transmits a signal to the fire alarm control unit indicating that the device has undergone a change of state. Initiating devices may transmit alarm signals or supervisory signals. Types of initiating devices include: pull stations, smoke detectors, water flow switches, tamper switches, low air switches etc.

### Notification Device
A device that is an active fire protection component of a fire alarm system. A notification device may use audible (horn) or visible (strobe) to alert the occupants of a fire or other emergency condition requiring action.

### Fire Barrier
A wall or floor used to prevent the spread of fire for a prescribed period of time. A fire barrier must have the openings sealed by fire doors/windows, penetration seals, fire dampers, etc. of the appropriate rating to ensure the integrity of the Fire Barrier. Most Fire Barriers in SWPF have a 2 hour fire rating. Fire Barriers may be made of concrete or sheetrock (per a specific approved design).

## 1.0 SCOPE

The Fire Protection (FP) systems for Salt Waste Processing Facility (SWPF) provide fire suppression, fire detection, and alarm notification to occupants and to the Savannah River Site (SRS) Fire Department. The systems comply with the fundamental objectives that are outlined in S-RCP-J-00001, *SWPF Standards/Requirements Identification Document*\(^1\). The following S-RCP-J-00001\(^1\) objectives are satisfied by the installed FP systems:
1. To minimize the potential for occurrence of a fire or related event;
2. To minimize the potential for a fire that causes an onsite or offsite release of hazardous and radiological material that will threaten the health and safety of employees, the public, or the environment;
3. To minimize the potential for vital U.S. Department of Energy (DOE) programs suffering unacceptable interruptions as a result of fire and related hazards;
4. To minimize the potential for property losses from fire and related events exceeding defined limits;
5. To minimize the potential for critical process controls and safety-related systems being damaged as a result of a fire or related events; and
6. To implement a comprehensive FP program that provides an acceptable level of life safety from fire and related events to site personnel and the public.

The Operations objectives are derived from DOE O 420.1C, Change 1, Facility Safety, specifically listed in the SWPF contract. The design and construction of SWPF and any ongoing physical work is in compliance with DOE O 420.1B Chg 1, Facility Safety.

DOE Orders specify that a formal Fire Hazards Analysis (FHA) will be the governing upper-tier document that provides the actual determination, selection, and means of satisfying applicable DOE-Savannah River and National Fire Protection Association (NFPA) requirements. The FP and detection systems for SWPF have been selected based on the FHA.

7. The overall FP system for SWPF will interface with the existing S-Area FP Water Supply System, as described in V-ESR-J-00017, SWPF Fire Protection Water System Interface Control Document (ICD-17). The SWPF FP systems will consist of a combination of suppression and detection systems, each designed for specific applications commensurate with the hazard present inside and outside the facility.

The safety analysis requirements related to system functions for these systems are documented in Chapter 4 and Chapter 5 of S-SAR-J-00002, SWPF Documented Safety Analysis and in Section 5 of S-TSR-J-00001, SWPF Technical Safety Requirements. The discreet project design requirements for this system are documented in P-DB-J-00002, Design Criteria Database.

2.0 GENERAL OVERVIEW

The Suppression Schematic showing the main fire protection systems and flow paths is shown in M-M6-J-0096 SH1, SWPF Process Building Fire Protection Suppression P&ID (U), M-M6-J-0097, SWPF Administration Building Chiller & Compressor Building Suppression and Detection P&ID (U), and M-MA-J-00020, SWPF J-Area Fire Protection Supply Operating Diagram (U).

The Fire Detection Schematics showing the fire detection system riser diagrams are shown on the following:
SWPF System Description
Fire Detection/Protection

- J-JQ-J-0004 SH1, SWPF Fire Protection Fire Alarm Riser Diagram Network Loop, Sequence of Operations, and Compressor Building Riser (U)\(^{11}\),
- J-JQ-J-0004 SH2, SWPF Fire Protection Fire Alarm Riser Diagram Network Loop, Sequence of Operations, and Compressor Building Riser (U)\(^{12}\),
- J-JQ-J-0004 SH3, SWPF Fire Protection Fire Alarm Riser Diagram Network Loop, Sequence of Operations, and Compressor Building Riser (U)\(^{13}\),
- J-JQ-J-0004 SH4, SWPF Fire Protection Fire Alarm Riser Diagram Network Loop, Sequence of Operations, and Compressor Building Riser (U)\(^{14}\),
- J-JQ-J-0004 SH5, SWPF Fire Protection Fire Alarm Riser Diagram Network Loop, Sequence of Operations, and Compressor Building Riser (U)\(^{15}\),
- J-JQ-J-0005 SH1, SWPF Fire Protection Fire Alarm Riser Diagram Signaling Line Circuit Loop 1 and Loop 2 (U)\(^{16}\),
- J-JQ-J-0005 SH2, SWPF Fire Protection Fire Alarm Riser Diagram Signaling Line Circuit Loop 1 and Loop 2 (U)\(^{17}\),
- J-JQ-J-0005 SH3, SWPF Fire Protection Fire Alarm Riser Diagram Signaling Line Circuit Loop 1 and Loop 2 (U)\(^{18}\),
- J-JQ-J-0005 SH4, SWPF Fire Protection Fire Alarm Riser Diagram Signaling Line Circuit Loop 1 and Loop 2 (U)\(^{19}\), and
- J-JQ-J-0005 SH5, SWPF Fire Protection Fire Alarm Riser Diagram Signaling Line Circuit Loop 1 and Loop 2 (U)\(^{20}\).

In addition, physical drawings of the suppression systems include the P-PF-J-xxxx series of drawings (listed later in this document), M-MV-J-0001, Valve List\(^{21}\), J-JX-J-0001, Instrumentation Instrument Reference\(^{22}\) (pressure gages), and vendor drawings in RCNs 30122, 08497, 30070, and 30490. Physical drawings of the fire alarm systems include the J-JF-J-xxx series of drawings (listed later in this document), M-MX-J-00010, Specialty Item List\(^{23}\), and vendor drawings in RCNs 30123, 08587, 30070, and 30490. All systems were designed and installed in accordance with the appropriate National Fire Protection Association (NFPA) codes and standards and DOE Orders and Standards.

2.1 Process Building Fire Protection

The SWPF Process Building is provided with two independent connections to the FP water distribution system, one at each end of the building. These supply mains enter the building at the east (R183) and west (R182) ends and form a loop header that supplies standpipes for each of the four stairwells, hose stations, and the automatic sprinkler systems. The standpipe systems in the
stairwells provide Class 1 hose connections for use by the Fire Department. Additional hose stations are provided at strategic locations in the building.

The SWPF Process Building is provided with automatic sprinkler systems for all occupied areas and areas with combustible loading. The Process Cells, heating, ventilating, and air conditioning (HVAC), and piping chases are not occupied areas, therefore, these areas are not provided with sprinklers as allowed by approved Equivalencies, *F-ESR-J-00002*, *SWPF Fire Protection Engineering Equivalency Request Process Building Omission of Sprinklers in Process Vessel Cell Area*²⁴, and *F-ESR-J-00005*, *SWPF Fire Protection Engineering Equivalency Request Omission of Sprinklers in Waste Transfer Enclosure; West Utility Chase; HVAC Shielding Chase; South Utility Chase and Contactor Support Floor Chase; and East CSSX Tank Cell*²⁵. Automatic sprinklers are provided in enclosures, such as glove boxes, fume hoods, and hot cells. Manual water spray systems are provided for the Alpha Finishing Facility (AFF) and Process Building Ventilation System (PBVS) final exhaust High-Efficiency Particulate Air (HEPA) filter enclosures (FLT-001, FLT-002, FLT-003, FLT-004 and FLT-007). This method has been approved by DOE in Equivalency F-ESR-J-00003 (see *SWPF-10-217, Request for DOE Standard 1066 Equivalency Approval*²⁶). The entire SWPF is divided into separate fire areas to enhance American National Standards Institute (ANSI)/NFPA 101, *Life Safety Code*²⁷ features for the Facility and minimize potential monetary losses.

Automatic sprinkler systems are also provided separately for the J-Area Warehouse, Administration Building, and Compressor Building and the Next Generation Solvent (NGS) Building.

The underground fire water supply system is designed in accordance with NFPA 24, *Standard for the Installation of Private Fire Service Mains and their Appurtenances*²⁸.

The automatic suppression systems are designed and installed in accordance with NFPA 13, *Standard for the Installation of Sprinkler Systems*²⁹.

The standpipe hose systems are designed and installed in accordance with NFPA 14, *Standard for the Installation of Standpipe, Private Hydrants, and Hose Systems*³⁰.

Fire extinguishers are installed throughout in accordance with NFPA 10, *Standard for Portable Fire Extinguishers*³¹.


2.2 Process Building Fire Detection and Alarm Signaling

Smoke detection is provided for the SWPF Process Building Electrical Rooms, Control Room, and at other select locations including the Air Handling Unit supply ductwork. The detection
system puts the FACP in Alarm for water flow/pressure switches, pull stations, and area smoke/thermal detectors. Duct smoke detectors shut down the affected air handler and put the FACP in a Supervisory condition to allow an Operator to check out the situation. The supervisory condition and the air handler must be reset manually. Ventilation system duct smoke detection is also addressed in M-SD-J-00004, Heating, Ventilating, and Air Conditioning System Description\textsuperscript{35}. These systems are installed in accordance with NFPA 72, National Fire Alarm Code\textsuperscript{36}, and NFPA 90A\textsuperscript{32}.

The FACP also monitors control valve positions and low air signals. Fire alarm notification appliances are provided throughout all occupiable areas (which excludes the Process Cells, HVAC and piping chases). All Fire Alarm Control Panel (FACP) signals (Alarm, Trouble, and Supervisory) are automatically transmitted to the SRS Operations Center (SRSOC). An operator’s monitoring station (Notifier ONYXWORKS Workstation) was installed to ease FACP signal response and has the same operator control functions as the FACP.

The Notifier Network is a token-passing, peer-to-peer ring that connects the FACP in 221-J, the three RCPs in 221-J, the ONYXWORKS Workstation in 221-J, the FACP in the Compressor Building, and the FACP in the NGS Building. The 221-J FACP is not a master panel, but all signals on the network are transmitted to SRSOC by the Digital Alarm Communicator Transmitter (DACT) in the 221-J FACP.

2.3 Compressor Building Fire Protection

An automatic wet-pipe sprinkler system is provided in accordance with NFPA 13\textsuperscript{29}, along with fire extinguishers that are installed in accordance with NFPA 10\textsuperscript{31}. Thermal detection is provided above the FACP in accordance with NFPA 72\textsuperscript{36}, with a pull station at the exit. The detection system puts the FACP in alarm for water flow, pull station, and thermal detection. Also, the FACP monitors the control valve position. All FACP signals (Alarm, Trouble, and Supervisory) are transmitted to the SRSOC via the 221-J Control Room FACP.

2.4 Diesel Generator Building Fire Protection

Fire extinguishers are installed in accordance with NFPA 10\textsuperscript{31}. The diesel generator building is not required to have fire suppression or detection.

2.5 Administration Building Fire Protection

The Administration Building is provided with a complete automatic sprinkler system in accordance with NFPA 13\textsuperscript{29}. Fire extinguishers are installed in accordance with NFPA 10\textsuperscript{31}. The fire alarm system is provided in accordance with NFPA 72\textsuperscript{36}. Smoke detection is provided above the FACP and in the Storage Room with a pull station at each exit. The detection system puts the FACP in alarm for water flow, pull stations, and area smoke detection. Duct smoke detection puts the FACP in a supervisory condition. Also, the FACP monitors the control valve position. All FACP signals (Alarm, Trouble, and Supervisory) are automatically transmitted to the SRSOC. It should be noted that this FACP is not part of the Notifier Network and does not
communicate with the 221-J Control Room FACP. Events occurring in this building must be manually (via phone or radio) made to the Control Room/Shift Operations Manager.

2.6 NGS Building Fire Protection

An automatic wet-pipe sprinkler system is provided in accordance with NFPA 13\textsuperscript{29}, along with fire extinguishers that are installed in accordance with NFPA 10\textsuperscript{31}. Thermal detection is provided above the FACP with a pull station at each exit. The detection system puts the FACP in alarm for water flow, pull stations, and thermal detection. Also, the FACP monitors the control valve position. All FACP signals (Alarm, Trouble, and Supervisory) are transmitted to the SRSOC via the 221-J Control Room FACP.

2.7 J Area Warehouse Building Fire Protection

An automatic wet-pipe sprinkler system is provided in accordance with NFPA 13\textsuperscript{29}, along with fire extinguishers that are installed in accordance with NFPA 10\textsuperscript{31}. Smoke detection is provided above the FACP with a pull station at each exit. The detection system puts the FACP in alarm for water flow, pull stations, and smoke detection. Also, the FACP monitors the control valve position. All FACP signals (Alarm, Trouble, and Supervisory) are transmitted directly to the SRSOC. This FACP is not part of the Notifier Network and does not communicate with the 221-J Control Room FACP. Events occurring in this building must be manually (via phone or radio) made to the Control Room/Shift Operations Manager.

2.8 Yard Fire Protection

SWPF is provided with an underground FP water supply and distribution system. The water supply consists of a 319,000-gallon water storage tank with 240,000 gallons dedicated to fire protection. The tank feeds a dedicated fire water pumping system consisting of one electric pump and one diesel pump that feed the underground fire water supply in S Area. The J Area system connects to the S Area system at two points. From these two points, a loop was created around the 221-J Building. This system feeds a network of fire hydrants for the yard and surrounding area and supplies the systems within the SWPF and outlying areas. Sectional valves are installed in the underground system to allow isolation of sections of the underground water supply without taking all fire water out of service. The sectional valves and the isolation valves on fire water piping supplying buildings use Post Indicating Valves (PIVs) that allow the valve status to be easily determined by the aboveground indicator. The underground distribution system and fire hydrant locations are depicted on drawing C-CY-J-0025, SWPF Civil Fire Protection Piping Plan SWPF Operations Area (U)\textsuperscript{37}. The underground FP water supply and distribution system design is shown on M-MA-J-00020\textsuperscript{10}. The system is designed and installed in accordance with NFPA 24\textsuperscript{28}. 
3.0 PROCESS BUILDING FIRE PROTECTION

3.1 System Functions

The installed FP systems provide water-based fire suppression for all portions of the Facility, except areas noted in previous sections, which are provided with equivalent protection as determined in approved Equivalencies. These systems are automatically actuated. Standpipe hose connections provide additional manual suppression capabilities for the Fire Department. Fire alarm interfaces provide notification of system actuation and general supervisory status signals.

3.1.1 Functional Classification

Functional Classification of the Fire Detection/Protection Systems is General Service-1, except for some small bore piping and thermal detector boundaries, penetrating the HEPA Filter Boundary, protecting final HEPA filters, which are Safety Significant because these components penetrate the exhaust air flow path.

3.2 Operational Overview

The installed FP sprinkler systems are automatic with the exception of the HEPA Filter Manual Suppression Systems. The FACP's are provided with a battery back-up system in the event normal power is lost. The overall water supply for SWPF is located in S-Area which includes a fire water storage tank with an electric and a diesel-driven fire pump in case of power loss. Activation of a wet pipe suppression system is based on heat generation, which fractures a temperature-calibrated glass bulb containing an expanding liquid. The size and growth of the fire determine the number of heads that actuate to suppress the fire.

Activation of a deluge suppression system, which uses open sprinklers, occurs when heat sensitive wire is heated beyond its activation temperature and provides a signal to the Release Control Panel (RCP) that controls the deluge valve. A pre-action system activates similarly to a deluge system, except after the smoke detection system opens the pre-action valve and the piping fills with water, the sprinkler heads must be heated to open (similar to a wet pipe system) before water discharges from the sprinkler. Once this signal is received the trim devices reposition and cause the deluge valve or pre-action valve to trip. A dry pipe system utilizes a spring and air pressure (usually about a 7:1 water to air pressure ratio) to keep the dry pipe valve shut. When the sprinkler head on a dry pipe system opens, pressure is released through the head until there is insufficient air pressure to keep the dry pipe valve shut. All riser valves act as a check valve. The systems discharge until the isolation valves are manually closed and isolated from the remainder of the 221-J systems. The individual systems covering zones and fire areas are isolated by a manual gate valve with a tamper switch. The FACP provides local notification of actuation, 221-J Control Room notification and reports to the SRSOC. Other systems such as the standpipe hose system, fire extinguishers, and yard hydrants located around the building are manually operated on an as-needed basis.

The Fire Suppression systems are shut down by isolating water supplies. Shutting down any Fire Protection System for longer than 4 hours will require an approved Impairment Permit.
EN-5036, Fire Protection Impairment Control\textsuperscript{38}). Manually operated gate valves are provided at each system and at critical locations. Each system can be placed into a shutdown mode while maintaining operability of all other systems. A shutdown of the S-Area fire pump system could have a widespread effect on operability of the SWPF systems. In the event of a shutdown of the S-Area fire pump system, compensatory measures, such as connecting a fire pumper and tanker to the Fire Department Connection (FDC) at the SWPF to provide firefighting/suppression capabilities, may be put in place to allow continued operation of SWPF.

If the S Area fire water supply is out of service, the cross-connect valve (PIV-40) to H Area is opened. Then the fire water supply to S and J Areas will be from H Area.

### 3.3 Configuration Information

#### 3.3.1 Description of System

Area smoke detection, thermal detection, duct smoke detection, flow switch activation, tamper switch activation, pull stations, low air indication (dry pipe and pre-action systems), high pressure indication (dry pipe system) and general alarm signaling requirements are contained in NFPA 72\textsuperscript{36}. Wiring installation and grounding requirements are found in NFPA 70, National Electrical Code\textsuperscript{39}.

The wet-pipe automatic sprinklers systems comprise the majority of the overall FP system for the SWPF. These systems are fed from a 6-inch fire main that is routed throughout the building in a loop configuration. Two-and-one-half-inch (2½") fire hose connections (also called hose stations) are provided at strategic locations and at floor landings supplied by 4-inch to 6-inch standpipes located in each of the four stairwells in the building.

Standpipes on the north side of the CPA in Stair #1 and Stair #2 are connected at the top along the north wall of the 139 Level, and the standpipes on the south side in Stair #3 and Stair #4 are connected at the top along the south wall of the 139 Level. The hose stations are for Fire Department use only. The standpipe system is classified as a manual, Class I wet standpipe system with a connected water supply in accordance with NFPA 14\textsuperscript{30}. The pressure and flow requirements of the standpipe are met by the Fire Department connecting to the systems at the FDC on either the east or the west side of the building.

Eighteen systems (plus sub-systems in some of the systems) provide coverage for the Process Building (which includes AFF, Cold Chemicals Area [CCA], and North and East Facility Support Area [FSA]), Compressor Building, Administration Building, and the J-Area Warehouse. These systems and features are depicted on drawing M-M6-J-0096 SH1\textsuperscript{8} and M-M6-J-0097\textsuperscript{9} and P-PF-J-0001, SWPF Process Building Fire Protection Central Process Area Floor Plan at EL 88'6", 92'0" and 100'0" (U)\textsuperscript{40} through P-PF-J-0010, SWPF Compressor Building Fire Protection Floor Plan at Elevation 100'0" (U)\textsuperscript{41} (see Section 3.3.3 of this document).

Each system is isolated by a manual gate valve and equipped with a valve tamper switch and a flow alarm switch. Most systems are a wet-pipe system. All systems will discharge until the isolation valve is manually closed. With the exception of wet pipe systems, the sprinkler system
is then manually reset. For deluge and pre-action systems, the FACP must be reset to clear the alarm that activated the valve, prior to resetting the deluge/pre-action valve.

Each system is designed in accordance with NFPA 13 Ordinary Hazard, Group 2, design density requirements. Minimum design density is 0.20 gallons per minute per square foot, over a design area of 1,500 square feet plus 250 gallons per minute for hose stream.

The Truck Ramp and Receiving Dock outside of the CCA are protected by an automatic dry pipe sprinkler system. It is fed from the loop and is located adjacent to the CCA wet pipe sprinkler system.

The Main Electrical Room and the Control Room/Uninterruptible Power Supply rooms are protected by pre-action sprinkler systems. The piping for these systems remains dry (with compressed air) until an area smoke detector releases the pre-action valve to allow water into the piping. Water flows into the room only when a sprinkler opens to allow water to flow out.

Sub-systems in some of the labyrinths and the Contactor Support Floor are deluge systems. These systems are open head sprinkler, dry pipe systems. When the deluge valve opens, water flows into the piping and out the open sprinklers. The deluge valve for the labyrinths is actuated by heat detection thermal wire. A deluge valve for the eastern or western section of the Contactor Support Floor is actuated by flow to a standard sprinkler in the associated section of the Contactor Operating Deck.

The radiochemistry hoods, fume hoods, glove boxes, and the Sample Transfer System are protected by automatic sprinklers. These systems are fed from the sprinkler system in the Analytical Laboratory. The pressure is regulated at 30 pounds per square inch gauge and use low flow (low K-factor) sprinklers to minimize the water flow into these components while still providing adequate sprinkler density to the enclosures.

The final exhaust HEPA filters larger than 16 square feet in surface area include FLT-001, -002, -003, and -004 in the PBVS and FLT-007 in the AFF Exhaust System. These filters are protected by an ember screen in the upstream ductwork and by a manual water spray system upstream of the first HEPA filter section. Rate compensated heat detectors in the ductwork upstream of the HEPA filter enclosures and in the filter enclosures downstream of the HEPA filters send an alarm signal to the FACP. If required, SRS Fire Department personnel will open the appropriate valve to discharge water on the affected filter.

All system components are Underwriters Laboratory/Factory Mutual Engineering and Research Council-approved. Cabling and conduit comply with applicable portions of NFPA 70 and NFPA 72. Circuitry is Class B with no T-taps. The interface with SRSOC complies with applicable SRS requirements for their Central Monitoring Station.

Fire extinguishers are provided throughout the facility, in accordance with NFPA 10.
3.3.2 Major Components

There are few major components to these systems. The fire suppression systems are essentially an arrangement of piping, specialized valves, sprinkler heads, and controls. The Fire Alarm systems are essentially a FACP, with battery backup for 24 hours of operation, initiating devices, notification devices, communication devices, wiring and conduit and include a Digital Alarm Communicator Transmitter (DACT).

The SWPF Fire Alarm System has five (5) main FACP and three (3) Release Control Panels (RCPs) in 221-J. The RCPs are based on the same Notifier equipment as the smaller FACP and control the deluge systems. The main FACP in the control room, the RCPs, and the FACP in the Compressor Building and the NGS Building are on the Notifier Network. The main FACP communicates with SRSOC. The FACP in the Administration Building and the Warehouse are not on this network loop and communicate directly to SRSOC. A description of each control panel is as follows:

1. The Control Room FACP (FACP-101) is located in the 221-J Control Room. It is manufactured by Notifier and is a model NFS2-640. This FACP monitors all initiation devices in 221-J and activates notification appliances on all levels. This FACP provides power to the notification appliances on the first level Facility Support Area. Other power supply panels provide power to other notification appliance circuits. This FACP is fed from circuit 311-10 (ref. J-JQ-J-0004 SH3<sup>13</sup> and J-JQ-J-0005 SH<sub>16</sub>) and powers Notification Appliance Circuits (NAC) NAC-1, NAC-2, NAC-3, and NAC-4.

2. RCP-1 is a Release Control Panel located in Room R131. It is manufactured by Notifier and is based on the model NFS-320. This RCP monitors devices and activates the deluge valves for Sprinkler Systems #4A, #4B, and #4C. This RCP is fed from circuit 311-35. All signals from this panel are sent to FACP-101. (ref. J-JQ-J-0004 SH2<sup>12</sup>)

3. RCP-2 is a Release Control Panel located in Corridor R136. It is manufactured by Notifier and is based on the model NFS-320. This RCP monitors devices and activates the deluge valve for Sprinkler System #5D. This RCP is fed from circuit 322-29. All signals from this panel are sent to FACP-101. (ref. J-JQ-J-0004 SH2<sup>12</sup>)

4. RCP-3 is a Release Control Panel located in Room R250. It is manufactured by Notifier and is based on the model NFS-320. This RCP monitors devices and activates the deluge valves for Sprinkler Systems #8C and #8D. This RCP is fed from circuit 330-31. All signals from this panel are sent to FACP-101. (ref. J-JQ-J-0004 SH2<sup>12</sup>)

5. The Compressor Building (221-4J) FACP (FACP-500) is located on the center of the East wall of the building. It is manufactured by Notifier and is a model NFS-320. This FACP monitors all devices for the Compressor Building. This FACP is fed from circuit 315-07. All signals from this panel are sent to FACP-101. (ref. J-JQ-J-0004 SH<sub>11</sub>)

6. The NGS Building (221-6J) FACP (FACP-600) is located on the South wall of this building. It is manufactured by Notifier and is a model NFS-320. This FACP monitors all devices for
the NGS Building. This FACP is fed from circuit 346-23. All signals from this panel are sent to FACP-101. (ref. J-JQ-J-0004 SH1)

7. The Administration Building (704-J) FACP is located in the entrance vestibule of 704-J. It is manufactured by Notifier and is a model NFS-320. This FACP monitors all devices for the Administration Building. This FACP is fed from Panel L1, Circuit #28. All signals from this panel are sent directly to SRSOC. The 221-J Control Room will not have any notification of this FACP’s signal generation. Notification to the 221-J Control Room must be made manually (e.g. phone, radio, or in person) (ref. J-JQ-J-0005 SH5)

8. The Warehouse Building (763-S) FACP is located on the South wall in the East Corner, behind the offices. It is manufactured by Notifier and is a model NFS-320. This FACP monitors all devices for the Warehouse Building. This FACP is fed from Panel A, Circuit A10. All signals from this panel are sent directly to SRSOC. The 221-J Control Room will not have any notification of this FACP’s signal generation. Notification to the 221-J Control Room must be made manually (e.g. phone, radio, or in person) (ref. J-JQ-J-0005 SH5)

The Control Room FACP, the 704-J FACP, and the Warehouse (763-S) FACP include a Universal Digital Alarm Communicator Transmitter (UDACT). The UDACT converts the FACP signal(s) into a signal configuration that can be sent over telephone lines and then converted back to FACP type signals by the Central Monitoring Station at the SRSOC.

There are several Transponder/Power Supply Cabinets and are identified by the pre-fix FAA. These panels are connected to the main FACP by one of the two Signaling Line Circuits of the FACP. These provide a means to easily monitor devices without having to run cable back to the 221-J Control Room FACP. Most provide a power supply with battery backup to operate higher power demand notification devices (e.g. horns, strobes, relays, etc.).

1. In the West Riser Room, R182, FAA-100A monitors devices in the North FSA, Maintenance shops, and Truck Bay/Dock. This FAA does not have batteries or a power feed and does not power horns or strobes.

2. In the East Riser Room, R183, FAA-100B monitors devices in the East FSA, HP office area, Maintenance Shops, truck bay/dock, and the North ASP Pump and Valve Gallery (P&VG) Corridor and Stair #2. This FAA is fed from Circuit 312-30 and powers NAC-5, NAC-6, NAC-7, and NAC-8.

3. In the CCA Lab Storage Room, R154A, FAA-100C and FAA-100D monitors devices in the CCA and AFF and provides notification appliance power to Stairwell #3 and #4. These FAAs are fed from Circuit 322-28. FAA-100C powers NAC—9, NAC-10, NAC-11, and NAC-12. FAA-100D powers duct smoke detector relays in AFF and CCA.

4. In the Exhaust Fan Room, R302, FAA-200 monitors devices in the HEPA Filter Rooms, Waste Transfer Access Room, Contactor Drop Area, Cell Inlet HEPA Filter Room, Contactor Staging Area, Exhaust Fan Room, and HEPA Staging Area. This FAA is fed from
Circuit 317-26 and powers NAC-13, NAC-14, NAC-15, and NAC-16 on the 116 and 124 Levels.

5. In the PVVS/PMVS and Vent Room, R302, FAA-400 monitors devices in the Laboratory, Tank Cell Operating Deck, Stairwell #1 and #4. This FAA is fed from Circuit 328-10 and powers NAC-17, NAC-18, NAC-19, and NAC-20 on the 139 Level.

The remote annunciator panel, FAP-100, is located in the SSP Room, R181. This FAP has the same operator interface monitor as the Control Room FACP (FACP-101) and can be used to perform the same activities that can be done on the FACP-101 (e.g. see affected devices, silence alarms, etc.). This panel provides information to occupants in the event the Control Room is evacuated. Also, FACP-101 provides power to FAP-100.

Construction materials will comply with NFPA 13\(^29\) and NFPA 14\(^30\) for the fire suppression systems. In general, the fire suppression systems are constructed of Schedule 40 carbon steel pipe and malleable iron “Victaulic”-style grooved fittings. Depending on pipe size, certain other fittings are ductile iron or welded carbon steel. Schedule 40 stainless steel will be utilized in the hot cell, pump and valve labyrinths. Sprinkler heads in all the buildings have 1/2” orifice, with the exception of the Laboratory Gloveboxes/Hood (which have 1/4” and 3/8” orifices), and the Warehouse which has 3/4” orifices. A 6-inch outside stem and yoke (OS&Y) valve and 6-inch riser check valves are provided for each riser room. Except the Administration Building is provided with a 4” OS&Y valve and a 4” riser check valve. The OS&Y valve is provided with a supervisory tamper switch to ensure that the valve remains open. Each FDC will require a 4-inch ductile iron check valve.

Vertical standpipes in the stairwells are 6 inches in Stair #1 and Stair #4 and 4 inches in Stair #2 and Stair #3. Bladder tanks are installed where the underground water supply enters on the east and west sides of the SWPF building, the Compressor Building, and the NGS Building (located inside the building) to cushion the SWPF sprinkler systems from pressure surges from the S-Area Fire Pump.

Hose connections are 2-1/2 inches and consist of brass hose gate valves with screwed brass caps. The highest point of each standpipe is provided with a pressure indicator and an air release/drain device. Certain other strategic locations such as the CCA, the AFF, FSAs, and the Truck Unloading/Dock Area are also provided with hose connections. This arrangement complies with applicable codes and standards.

### 3.3.3 Physical Location and Layout

In addition to drawings listed here, vendor drawings provide additional system detail. These include documents in Requisition Control Number 30122 and 08497 (sprinkler systems), 30123 and 08587 (fire alarm systems), 30070 (sprinkler and fire alarm for the Administration Building), and 30490 (sprinkler and fire alarm for the NGS Building). Pertinent drawings from these contracts will be converted to permanent drawings.
Riser check valves are located at the east and west ends of the building in separate water supply mains. The supplies tie into a loop header that feeds the vertical standpipes in each of the four stairwells and automatic sprinkler systems located throughout the occupiable areas of the facility. The standpipes at the top of Stair #1 and #2 are connected at the top by a 4 inch pipe along the north wall of the 139 level. The standpipes at the top of Stair #3 and #4 are connected at the top by a 4 inch pipe along the south wall of the 139 level. The interior FP loop and sprinkler system tie-in points are depicted on the following SWPF Process Building Fire Protection Piping Diagram Plans for various elevations:

- P-PF-J-0001, SWPF Process Building Fire Protection Central Process Area Floor Plan at EL 88’-6”, 92’-0” and 100’-0” (U)\(^{40}\);
- P-PF-J-0002, SWPF Process Building Fire Protection Cold Chemicals Area Floor Plan at EL 100’-0” (U)\(^{42}\);
- P-PF-J-0003, SWPF Process Building Fire Protection Northern Facility Support Area Floor Plan at EL 100’-0” (U)\(^{43}\);
- P-PF-J-0004, SWPF Process Building Fire Protection Eastern Facility Support Area Floor Plan at EL 100’-0” (U)\(^{44}\);
- P-PF-J-0005, SWPF Process Building Fire Protection Alpha Finishing Facility Floor Plan at EL 95’-0” and 100’-0” (U)\(^{45}\);
- P-PF-J-0006, SWPF Process Building Fire Protection Central Process Area Floor Plan at EL 108’-0” and 116’-0” (U)\(^{46}\);
- P-PF-J-0007, SWPF Process Building Fire Protection Central Process Area Floor Plan at EL 124’-0” (U)\(^{47}\);
- P-PF-J-0008, SWPF Process Building Fire Protection Central Process Area Floor Plan at EL 139’-0” (U)\(^{48}\);
- P-PF-J-0009, Sht. 1, SWPF Process Building Fire Protection Removable Pipe Sleeve Details (U)\(^{49}\);
- P-PF-J-0009, Sht. 2, SWPF Process Building Fire Protection Duct Spray Nozzle Details (U)\(^{50}\);
- P-PF-J-0010, SWPF Compressor Building Fire Protection Floor Plan at Elevation 100’-0” (U)\(^{51}\);
- P-PF-J-0011, Warehouse 763-S Civil Fire Protection Plan (U)\(^{52}\);
- J-JF-J-0001, SWPF Process Building Fire Detection and Alarm System Location Index Key Plan, EL 100’-0” (U)\(^{53}\);
- J-JF-J-00021, SWPF Process Building Fire Detection and Alarm System Location Plan, EL 116’-0” (U)\(^{54}\);
- J-JF-J-00027, SWPF Process Building Fire Detection and Alarm System Location Plan, EL 124’-0” (U)\(^{55}\);
• J-JF-J-00030, SWPF Process Building Fire Detection and Alarm System Location Plan, EL 139'-0" (U)55;

• J-JF-J-00037, SWPF Process Building Fire Detection and Alarm System Location Plan, EL 100'-0" (U)56;

• J-JF-J-0005, SWPF Process Building Fire Detection and Alarm System Process Area Control Room, SSFT and SEHT Cells Location Plan at EL 100'-0" (U)57;

• J-JF-J-0006, SWPF Process Building Fire Detection and Alarm System Process Area North ASP Pump and Valve Gallery, AST-A and FFT-A Cells Location Plan at EL 100'-0 (U)58;

• J-JF-J-0007, SWPF Process Building Fire Detection and Alarm System Process Area North ASP Pump and Valve Gallery, ASDT and SSRT/WWHT Cells Location Plan at EL 100'-0" (U)59;

• J-JF-J-0008, SWPF Process Building Fire Detection and Alarm System CSSX Cell CSSX Pump and Valve Gallery and CSSX West Tank Cell Location Plan at EL 100'-0" (U)60;

• J-JF-J-0009, SWPF Process Building Fire Detection and Alarm System CSSX Cell CSSX Pump and Valve Gallery and East CSSX Tank Cell Location Plan at EL 100'-0" (U)61;

• J-JF-J-0010, SWPF Process Building Fire Detection and Alarm System CSSX Cell ASP CSSX Pump and Valve Gallery and Decon Area Location Plan at EL 100'-0" (U)62;

• J-JF-J-0011, SWPF Process Building Fire Detection and Alarm System Cold Chemicals Area Location Plan EL 100'-0" (U)63;

• J-JF-J-0012, SWPF Process Building Fire Detection and Alarm System Cold Chemicals Area Location Plan EL 100'-0" (U)64;

• J-JF-J-0013, SWPF Process Building Fire Detection and Alarm System Facility Support Area Electrical Room Location Plan at EL 100'-0" (U)65;

• J-JF-J-0014, SWPF Process Building Fire Detection and Alarm System Facility Support Area Mechanical Room Location Plan at EL 100'-0" (U)66;

• J-JF-J-0015, SWPF Process Building Fire Detection and Alarm System Facility Support Area Break Room and Locker Rooms Location Plan at EL 100'-0" (U)67;

• J-JF-J-0016, SWPF Process Building Fire Detection and Alarm System Facility Support Area Truck Bay and Offices Location Plan at EL 100'-0" (U)68;

• J-JF-J-0017, SWPF Process Building Fire Detection and Alarm System Facility Support Area Truck Bay, General Maintenance Shop and Health Physics Location Plan at EL 100'-0" (U)69;

• J-JF-J-0018, SWPF Process Building Fire Detection and Alarm System Facility Support Area Equipment Corridor, Elec., Mech., and Inst. Shops Location Plan at EL 100'-0" (U)70;

• J-JF-J-0019, SWPF Process Building Fire Detection and Alarm System Alpha Finishing Facility AFF, Electrical and AHU Rooms Location Plan at EL 100'-0" (U)71;
Fire Barriers (and components) and Life Safety components/considerations are depicted on the following drawings:

- **A-A1-J-0001**, *SWPF Process Building – Architectural Life Safety – Occupancy Plan at Elevation 100’-0” (Unless Otherwise Noted)* (U)\(^74\),
- **A-A1-J-0002**, *SWPF Process Building – Architectural Life Safety – Occupancy Plan at Elevation 116’-0” (Unless Otherwise Noted)* (U)\(^75\),
- **A-A1-J-0004**, *SWPF Process Building – Architectural Life Safety – Occupancy Plan at Elevation 139’-0” (U)*\(^77\),
- **A-A1-J-0005**, *SWPF Process Building – Architectural Life Safety – Occupied/Non-Occupied and Exiting Plan at Elevation 100’-0” (Unless Otherwise Noted)* (U)\(^78\),
- **A-A1-J-0008**, *SWPF Process Building – Architectural Life Safety – Occupied/Non-Occupied and Exiting Plan at Elevation 139’-0” (U)*\(^81\),
- **A-A1-J-0009**, *SWPF Process Building – Architectural Life Safety – FHA Fire Areas and Fire Walls at Elevation 100’-0” (Unless Otherwise Noted)* (U)\(^82\),
- **A-A1-J-00013 SH1**, *SWPF Process Building – Architectural-Central Process Area Fire Extinguisher Plan at Elevation 100’-0” (U)*\(^86\),
- **A-A1-J-00013 SH2**, *SWPF Process Building – Architectural-Cold Chemicals Area Fire Extinguisher Plan at Elevation 100’-0” (U)*\(^87\),
- **A-A1-J-00013 SH3**, *SWPF Process Building – Architectural-Northern Facility Support Area Fire Extinguisher Plan at Elevation 100’-0” (U)*\(^88\),
• A-A1-J-00013 SH4, SWPF Process Building – Architectural-Eastern Facility Support Area Fire Extinguisher Plan at Elevation 100'-0” (U) \textsuperscript{89},

• A-A1-J-00013 SH5, SWPF Process Building – Architectural-Alpha Finishing Facility Fire Extinguisher Plan at Elevation 100'-0” (U) \textsuperscript{90},

• A-A1-J-00013 SH6, SWPF Process Building – Architectural-Central Process Area Fire Extinguisher Plan at Elevation 116'-0” (U) \textsuperscript{91},

• A-A1-J-00013 SH7, SWPF Process Building – Architectural-Central Process Area Fire Extinguisher Plan at Elevation 124'-0” (U) \textsuperscript{92},

• A-A1-J-00013 SH8, SWPF Process Building – Architectural-Central Process Area Fire Extinguisher Plan at Elevation 139'-0” (U) \textsuperscript{91},

• A-A2-J-0007, SWPF Process Building Architectural Central Process Area Plan At Elevation 100-0 (Unless Otherwise Noted) (U) \textsuperscript{94},

• A-A2-J-0008, SWPF Process Building Architectural - Cold Chemicals Area Plan At Elevation 100-0” (U) \textsuperscript{95},

• A-A2-J-0009, SWPF Process Building Architectural Northern Facility Support Area Plan At Elevation 100'-0” (U) \textsuperscript{96},

• A-A2-J-0010, SWPF Process Building Architectural Eastern Facility Support Area Plan At Elevation 100'-0” (U) \textsuperscript{97},

• A-A2-J-0011, SWPF Process Building Architectural Alpha Finishing Facility Plan Elevation 100'-0” (Unless Otherwise Noted) (U) \textsuperscript{98},

• A-A2-J-0012, SWPF Process Building Architectural Central Process Area Plan At Elevation 116-0 (Unless Otherwise Noted) (U) \textsuperscript{99},

• A-A2-J-0013, SWPF Process Building Architectural Central Process Area Plan At Elevation 124-0 (U) \textsuperscript{100},

• A-A2-J-0014, SWPF Process Building Architectural Central Process Area Plan At Elevation 139-0 (U) \textsuperscript{101},

• A-A5-J-0003, SWPF Process Building Architectural Door Schedule (U) \textsuperscript{102}, and

• A-A5-J-0004, SWPF Process Building Architectural Door and Window Schedule (U) \textsuperscript{103}.

Emergency Lights and Exit Signs are shown on the following drawings:

• E-EL-J-0001, SWPF Process Building Electrical Lighting Key Plan EL 100'-0” (U) \textsuperscript{104},

• E-EL-J-0002, SWPF Process Building Electrical Lighting Key Plan EL 116'-0” (U) \textsuperscript{105},

• E-EL-J-0003, SWPF Process Building Electrical Lighting Key Plan EL 124'-0” (U) \textsuperscript{106},

• E-EL-J-0004, SWPF Process Building Electrical Lighting Key Plan EL 139'-0” (U) \textsuperscript{107},
• E-EL-J-0005, SWPF Process Building Electrical Central Process Area Lighting Plan EL 100'-0" (U)\textsuperscript{108},
• E-EL-J-0006, SWPF Process Building Electrical CSSX Cell Lighting Plan EL 100'-0" (U)\textsuperscript{109},
• E-EL-J-0007, SWPF Process Building Electrical Cold Chemicals Area Lighting Plan EL 100'-0" (U)\textsuperscript{110},
• E-EL-J-0008, SWPF Process Building Electrical Northern Facility Support Area Lighting Plan EL 100'-0" (U)\textsuperscript{111},
• E-EL-J-0009, SWPF Process Building Electrical Eastern Facility Support Area Lighting Plan\textsuperscript{112},
• E-EL-J-0010, SWPF Process Building Electrical Alpha Finishing Facility Lighting Plan EL 95'-0" and 100'-0" (U)\textsuperscript{113},
• E-EL-J-0011, SWPF Process Building Electrical Central Process Area Lighting Plan EL 116'-0" (U)\textsuperscript{114},
• E-EL-J-0012, SWPF Process Building Electrical CSSX Cell Lighting Plan EL 116'-0" (U)\textsuperscript{115},
• E-EL-J-0013, SWPF Process Building Electrical Central Process Area & CSSX Cell Lighting Plan EL 124'-0" (U)\textsuperscript{116},
• E-EL-J-0014, SWPF Process Building Electrical Central Process Area Lighting Plan EL 139'-0" (U)\textsuperscript{117},
• E-EL-J-0015, SWPF Process Building Electrical CSSX Cell Lighting Plan EL 139'-0" (U)\textsuperscript{118}, and
• E-EL-J-0016, SWPF Process Building Electrical Cold Chemicals Area Light Lowering System Plan EL 100'-0" (U)\textsuperscript{119}.

Fire Dampers are shown on the following drawings:
• P-PB-J-0001, SWPF Process Building Material Handling General Arrangement Laboratory Plan and Section (U)\textsuperscript{120},
• P-PH-J-0010, SWPF Process Building HVAC Central Process Area Control Room Floor Plan at EL 100-0" (U)\textsuperscript{121},
• P-PH-J-0012, SWPF Process Building HVAC Central Process Area North ASP P&V Gallery and Controlled Entry Area Floor Plan at EL 100-0" (U)\textsuperscript{122},
• P-PH-J-0015, SWPF Process Building HVAC Central Process Area SSRT/WWHT Cell and Material Staging and Storage Area Floor Plan at EL 100-0" (U)\textsuperscript{123},
• P-PH-J-0018, SWPF Process Building HVAC Central Process Area South ASP Pump and Valve Gallery and Drum Off/Decon Area Floor Plan at EL 100-0" (U)\textsuperscript{124},
• P-PH-J-0019, SWPF Process Building HVAC Northern Facility Support Area Electrical Room Floor Plan - EL 100-0 (U)\textsuperscript{125},
• P-PH-J-0020, SWPF Process Building HVAC Northern Facility Support Area Mechanical Room Floor Plan at El 100-0 (U)\textsuperscript{126},

• P-PH-J-0021, SWPF Process Building HVAC Northern Facility Support Area Locker Rooms and Break Room Floor Plan at El 100-0 (U)\textsuperscript{127},

• P-PH-J-0022, SWPF Process Building HVAC Eastern Facility Support Area Administrative Offices Floor Plan at El 100-0 (U)\textsuperscript{128},

• P-PH-J-0027, SWPF Process Building HVAC Alpha Finishing Facility Floor Plan at El 95'-0" and 100'-0" (U)\textsuperscript{129},

• P-PH-J-0028, SWPF Process Building HVAC Alpha Finishing Facility Floor Plan at El 95-3 and 100-0" (U)\textsuperscript{130},

• P-PH-J-0029, SWPF Process Building HVAC Central Process Area Exhaust HEPA Filter Room Floor Plan at EL 116-0" (U)\textsuperscript{131},

• P-PH-J-0031, SWPF Process Building HVAC Central Process Area Exhaust Fan Room and HVAC HEPA Filter Staging Area Floor Plan at EL 116-0" (U)\textsuperscript{132},

• P-PH-J-0032, SWPF Process Building HVAC Central Process Area SSFT and SEHT Cell Floor Plan at EL 116-0" (U)\textsuperscript{133},

• P-PH-J-0034, SWPF Process Building HVAC Central Process Area SSRT/WWHT Cell and Filter Drop Access Area Floor Plan at EL 116-0" (U)\textsuperscript{134},

• P-PH-J-0035, SWPF Process Building HVAC Central Process Area CSSX Contactor Support Floor Floor Plan at EL 116-0" (U)\textsuperscript{135},

• P-PH-J-0038, SWPF Process Building HVAC Central Process Area CSSX Contactor Operating Deck Floor Plan at EL 124-0" (U)\textsuperscript{136},

• P-PH-J-0040, SWPF Process Building HVAC Central Process Area Cell Inlet Air HEPA Filter Room #1 Floor Plan at EL 139-0" (U)\textsuperscript{137},

• P-PH-J-0043, SWPF Process Building HVAC Central Process Area Operating Deck Floor Plan at EL 139-0" (U)\textsuperscript{138},

• P-PH-J-0044, SWPF Process Building HVAC Central Process Area Operating Deck Floor Plan at EL 139-0" (U)\textsuperscript{139},

• P-PH-J-0045, SWPF Process Building HVAC Central Process Area Operating Deck Floor Plan at EL 139-0" (U)\textsuperscript{140},

• P-PH-J-0086, SWPF Process Building HVAC Details (U)\textsuperscript{141},

• P-PH-J-0089, SWPF Process Building HVAC Central Process Area Control Room Floor Plan at El 100-0" (U)\textsuperscript{142},

• P-PH-J-0090, SWPF Process Building HVAC Northern Facility Support Area Locker Rooms Floor Plan at EL 100-0" (U)\textsuperscript{143},
• **P-PH-J-00091**, SWPF Process Building HVAC Northern Facility Support Area Locker Rooms and Admin Offices Floor Plan at EL 100-0" (U)\(^{144}\),

• **P-PH-J-00094**, SWPF Process Building HVAC Eastern Facility Support Area Maintenance Areas Floor Plan at EL 100-0" (U)\(^{145}\),

• **P-PH-J-00095**, SWPF Process Building HVAC Cold Chemicals Area Floor Plan at EL 100-0" (U)\(^{146}\),

• **P-PH-J-00096**, SWPF Process Building HVAC Central Process Area Exhaust HEPA Filter and Fan Room Floor Plan at EL 116-0" (U)\(^{147}\),

• **P-PH-J-00097**, SWPF Process Building HVAC Central Process Area HVAC HEPA Filter Staging Area Floor Plan at EL 116-0" (U)\(^{148}\),

• **P-PH-J-00098**, SWPF Process Building HVAC Central Process Area PVVS/PMVS and Laboratory Vent Room Floor Plan at EL 139-0" (U)\(^{149}\), and

• **P-PH-J-00099**, SWPF Process Building HVAC Central Process Area PVVS/PMVS Fan Room and PVVS/PMVS Staging Area FLR Plan at EL 139-0" (U)\(^{150}\).

The following describes each sprinkler system and the area of coverage.

<table>
<thead>
<tr>
<th>Sprinkler System</th>
<th>Coverage</th>
</tr>
</thead>
</table>
| No. 1            | Process Building (Pre-action Sprinkler System)  
Information Technology Server Room, Control Room, Shift Supervisor Office, Safe Shutdown Panel Room |
| No. 2            | Facility Support (North Area) (Wet Pipe Sprinkler System)  
| No. 3            | Facility Support (East Area) (Wet Pipe Sprinkler System)  
| No. 4            | Process Building (Wet Pipe Sprinkler System)  
North Alpha Strike Process (ASP) Pump and Valve Gallery (P&VG), Controlled Entry Area, Contactor Rebuild Area, Stairwell #2, Material Staging and Storage Area |
| No. 4A           | North ASP Labyrinth #3 (Deluge Sprinkler System) |
Sprinkler System | Coverage
---|---
No. 4B | North ASP Labyrinth #4 (Deluge Sprinkler System)
No. 4C | North ASP Labyrinth #5 (Deluge Sprinkler System)
No. 5 | Process Building (Wet Pipe Sprinkler System)
| Caustic-side Solvent Extraction (CSSX) P&VG, South ASP P&VG, West CSSX Tank Cell, Radioactive Waste Storage #1, Stairwells #3 and #4, Waste Transfer Enclosure (WTE), Back-up Air Storage Room, Drum Off/Decon Area, Air Lock–
No. 5A | Not Used
No. 5B | Not Used
No. 5C | Not Used
No. 5D | CSSX Labyrinth #2 (Deluge Sprinkler System)
No. 6 | CCA (Wet Pipe Sprinkler System)
| Tank Area, Operator Station, Laboratory, Air Handling Unit (AHU) Room, Electrical Room–
No. 6A | CCA Truck Ramp and Receiving Dock (Dry Pipe Sprinkler System)
No. 6B | CCA Lab Hood (Wet Pipe Sprinkler System)
No. 7 | AFF (Wet Pipe Sprinkler System)
| Pumps/Tank Area, Personnel Access Air Lock, Electrical Room, AHU Room
No. 8 | Process Building (Wet Pipe Sprinkler System)
| CSSX Tank Cell Operating Deck, CSSX Contactor Drop Area, Cell Inlet Air HEPA Filter Room #2, Contactor Variable Frequency Drive Room–
No. 8A | Contactor Operating Deck (West) (Wet Pipe Sprinkler System)
No. 8B | Contactor Operating Deck (East) (Wet Pipe Sprinkler System)
No. 8C | Contactor Support Floor (West) (Deluge Sprinkler System)
No. 8D | Contactor Support Floor (East) (Deluge Sprinkler System)
No. 9 | Process Building (Wet Pipe Sprinkler System)
| Exhaust Fan Room, Exhaust HEPA Filter Room, Filter Storage, Filter Drop Area
No. 10 | Process Building (Wet Pipe Sprinkler System)
| Cell Inlet Air HEPA Filter Room #1, Process Vessel Ventilation System (PVVS)/Pulse Mixer Ventilation System (PMVS) and Laboratory Vent Room, PVVS/PMVS Fan Room, Storage, Stairwells #1 and #2 (Wet Pipe Sprinkler System)
In addition to active FP systems, the SWPF utilizes passive FP features, or compartmentalization, in the form of 2-hour fire rated barriers which serve to enhance the life safety features of the facility, isolate hazardous occupancies, and minimize fire loss potential. In addition to 2-hour fire barriers, fire dampers, fire doors, fire windows, and penetration seals are used to ensure fire rated separation.

In accordance with the objectives of DOE O 420.1B\(^3\), the Process Building is separated into 16 distinct Fire Areas (not including the Compressor Building, the Administration Building, and the J Area Warehouse) as follows:

1. Process Vessel Cell Area (R191, R192, R193, R194, R195, R196) and Waste Transfer Enclosure (R190) (no sprinklers);
wells (1NW, 2NE, 3SE, and 4SW) and the Equipment Lift Shaft (R500) (Sprinkler Systems 4 and 5, including Sub-systems 4A, 4B, 4C, and 5D);

3. Control Room, Information Technology Server Room (R116, R116A, R116B, R117, R118, R118A) (Sprinkler System 1);


5. Exhaust HEPA Filter and Fan Rooms (R202 and R203) (Sprinkler System 9);

6. Contactor Support Floor and Contactor Operating Deck (R216 and R252) (Sprinkler System 8, including Sub-systems 8A, 8B, 8C, and 8D);

7. Filter Storage and Drop Area at 116'-0", Cell Inlet HEPA Filter Room #2 at 116'-0", and CSSX Tank Cell Operating Deck (R201, R201A, R211, R212, R212A, R213, R214, R250, R251) (Sprinkler Systems 8 and 9);

8. Process Vessel Cell Operating Deck (R301, R301A, R310A, R310B, R310C, R310D, and R311) (Sprinkler Systems 10 and 11);

9. HEPA Filter Rooms and Laboratory Hot Cell Exhaust Room at 139'-0" (R302, R302A, R303, and R304) (Sprinkler System 10);

10. CCA (R150, R150A, R150B, R150C, R150D, R150E, R151, R152, R153, R154, R154A, R155, R156, R157, and R158) (Sprinkler System 6, including Sub-systems 6A and 6B);

11. AFF (R140, R141, R142, R143, R143A, R144, and R145) (Sprinkler System 7);

12. AFF HEPA Filter Room (R146) (Sprinkler System 7);

13. Analytical Laboratory Area and Hot Cell (R300, R300A, R312, R312A, R312B, R312C, R312D, R313, R314, R315, R315A, R316, R317, R318, R319, R319A, and R320) (Sprinkler System 12, including Sub-systems 12A, 12B, 12C, and 12D);


15. East CSSX Tank Cell (R138A) (no sprinklers); and

16. HVAC Shielding Chase (R204) (no sprinklers).

### 3.3.4 System Control Features and Interlocks

#### 3.3.4.1 System Monitoring

The fire alarm and detection systems consist of the main FACP (in 221-J Control Room), which reports to the SRSOC and is the interface for the other panels on the Notifier Network. Initiation devices activate the FACP and notification appliances alert occupants of a fire. Flow and tamper
sensing devices on each sprinkler system report to the main FACP, either directly or through another control panel. The alarm and detection system complies with WSRC-TM-95-1, SRS Engineering Standards Manual: Standard No. 01120: SRS Fire Protection Design Criteria and meets the specific requirements associated with monitoring and reporting capabilities and equipment compatibility. The ICD describing the emergency response relationship between the Engineering, Procurement, and Construction (EPC) Contractor and the Site Management and Operating Contractor is V-ESR-J-00012, Emergency Response Interface Control Document (ICD-12).

### 3.3.4.2 Control Functions

The fire alarm and detection systems satisfies the requirements of ANSI/NFPA 101 and NFPA 72, and it is a digital addressable system. The FACPs include battery back-up with a charging device. Alarm/strobe notification appliances are located throughout the facility and actuate upon input from any of the individually addressable devices associated with the suppression or detection systems in that facility. Some initiating devices, such as tamper switches, require the use of an externally mounted addressable interface module.

Manual pull stations are provided at each exit and at each level for the stairwells to satisfy ANSI/NFPA 101 and NFPA 72 requirements.

The Electrical Equipment Rooms, Control Room, Information Technology Server Room, and Uninterruptible Power Supply Room are provided with smoke detection systems. These detectors are standard ionization-type detectors and activate their associated sprinkler system.

The Labyrinths (#2, #3, #4, and #5) utilize a heat sensitive wire as a means to thermally detect a fire. Once this wire is heated, it must be replaced.

The NGS Building and the Compressor Building have a thermal detector located over or above the FACP.

HEPA Filters (FLT-001, FLT-002, FLT-003, FLT-004, and FLT-007) are provided with thermal detectors on the intake and discharge of the filters. These thermal detectors have a built in heating element, fed by a standard 120V cord, to test these detectors. These Filter detectors shall not be tested with air flowing through the specific HEPA filter.

### 3.3.4.3 Trips and Interlocks

HVAC duct smoke detectors located in the AHU supply ducts sense smoke and shut down the associated AHU, if actuated. Ventilation system smoke detection is also addressed in M-SD-J-00004.

### 3.3.5 Smoke Control Features

Where the HVAC ductwork passes through a fire barrier, a fusible link-type heat-actuated damper is provided, except for exhaust ductwork in systems required to operate for personnel/environmental protection.
In the event of a fire in a Process Cell or CSSX Tank Cell, the HVAC control system will continue to exhaust smoke and heat from these rooms. In the event of high temperature in one of the cells, the temperature sensor for that cell exhaust duct is interlocked with the Distributed Control System to close the supply damper to that cell. The exhaust system would continue to function to maintain the pressure differentials. In this configuration, the HVAC system would starve the fire of oxygen in the cell with the high temperature. High temperature air from one of the cells would be diluted with cooler air from the remainder of the cells before reaching the HEPA filters. Refer to the HVAC System Description in M-SD-J-00004\textsuperscript{35}.

### 3.3.6 System Testing

System inspection and testing for the suppression system occurs on a quarterly, semi-annual and annual frequency. This testing is performed in accordance with NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems\textsuperscript{153}. The Fire Alarm and Detection System inspection and testing occurs on a semi-annual and annual frequency in accordance with NFPA 7236. This testing and inspection is performed by a certified Fire System Testing Vendor as directed by a SWPF Work Order. Deficiencies may require a Fire Impairment and are corrected through SWPF processes.

### 3.3.7 Operations

#### 3.3.8 Initial Configuration

The suppression and fire alarm systems are designed and installed by certified fire system suppliers. All wet risers are charged with water and air was evacuated from the system to the extent possible, using test valves, vents, and drains. Air trapped in a wet pipe system can cause water hammers of false alarms when pressure changes.

#### 3.3.9 System Startup

The FP system suppliers were responsible for testing and certification of the systems. Final acceptance was by the EPC.

#### 3.3.10 Normal Operations

All installed FP systems are in an operational mode during normal operations. No special attention is required, other than periodic inspection and testing. Personnel are required to respond to any FACP signal (Alarm, Supervisory, and Trouble).

Manual in-line supply valves to the HEPA filter manual water spray system are normally closed and the associated drain valve is locked open to ensure that any valve seat leakage will not result in water entering the HEPA enclosure and damaging the Safety Significant HEPA filters. The drain valve is closed and the water supply valves opened only in the event that there is indication of a fire within the HEPA enclosure. This activity will be performed by the SRS Fire Department.
3.3.11 Off-Normal and Recovery Operations

Following activation of a sprinkler system, flow will be maintained through the system until it is no longer required and will then be stopped by shutting an appropriate manual valve. The affected portion of the system will be inspected and maintained as necessary (e.g., replacement of sprinkler heads). After completion of maintenance, the affected portion of the system will be returned to its regular operational mode. If the system is out of service for longer than 4 hours, an Impairment is required per PP-EN-5036\(^{38}\).

3.3.12 System Shutdown

The systems are shut down by isolating water supplies. Manually operated gate valves are provided at each system and at critical locations. Each system can be placed into a shutdown mode while maintaining operability of all other systems. Only a shutdown mode in the S-Area could have an effect on operability of the SWPF systems. This condition would require implementing compensatory measures in order for SWPF to remain operational. When the water supply from S Area is not available, a cross-connect valve (PIV-40 located in S Area) is opened so that the water supply to S and J Areas can be fed from H Area.

A Fire Alarm System may be shut down by de-energizing the breaker feeding the panel and disconnecting the batteries. It requires an Impairment per PP-EN-5036\(^{38}\).

With the use of the ONYXWORKS Workstation, specific initiating devices may be taken out of service for maintenance activities. This activity would allow one or more device to have its signal ignored by the FACP while maintenance is being performed. This is typically done when maintenance (e.g. welding is performed near a smoke detector). The need to shut down the entire Fire Alarm System is eliminated. This activity is performed by the Fire Protection Coordinator.

3.3.13 Administrative and Compensatory Controls

Administrative Controls and Compensatory Measures are implemented to reduce the hazard to the personnel/facility/environment when a Fire System is taken out of service. These Measures can include the following:

- Establishing a Fire Watch/Patrol throughout areas affected by the impairment;
- Placing signs in buildings indicating that fire alarm testing is taking place;
- Suspending hot work in the affected areas;
- Evaluating the need for suspension of hazardous operations or hazardous work activities in the affected area;
- Eliminating sources of ignition;
- Maintain a temporary cross connection water supply to the affected FPS, such as supplying water to the FPS from a fire hydrant, if impairment is the fire main;
- Bagging of smoke/fire detectors during repairs or modifications that generate particulates;
- Evacuating the affected area or the building/facility if required and;
- Staging additional portable fire extinguishers;
- Ensuring paths of egress are maintained in the affected area during repairs and modifications.

The Fire Protection Impairment Control Procedure, PP-EN-5036\textsuperscript{38} ensures appropriate Compensatory Measures are in place when fire detection/protection equipment is impaired.

### 3.3.13.1 Codes, Standards, and Regulations

The codes of record are identified in P-DB-J-00002\textsuperscript{7}. The DOE Standards and Orders take precedence over NFPA codes if there is a discrepancy. As a nuclear waste processing facility, NFPA 801, *Standard for Fire Protection for Facilities Handling Radioactive Materials*\textsuperscript{154} takes precedence over general classifications and requirements of ANSI/NFPA 101\textsuperscript{27}.

Table 3-1 presents the design Code of Record.

#### Table 3-1. NFPA Code of Record

<table>
<thead>
<tr>
<th>NFPA Code</th>
<th>Title</th>
<th>Code of Record</th>
</tr>
</thead>
<tbody>
<tr>
<td>NFPA 10\textsuperscript{31}</td>
<td><em>Standard for Portable Fire Extinguishers</em></td>
<td>2002</td>
</tr>
<tr>
<td>NFPA 13\textsuperscript{29}</td>
<td><em>Standard for the Installation of Sprinkler Systems</em></td>
<td>2002</td>
</tr>
<tr>
<td>NFPA 14\textsuperscript{40}</td>
<td><em>Standard for the Installation of Standpipe and Hose Systems</em></td>
<td>2003</td>
</tr>
<tr>
<td>NFPA 24\textsuperscript{28}</td>
<td><em>Standard for the Installation of Private Fire Service Mains and Their Appurtenances</em></td>
<td>2002</td>
</tr>
<tr>
<td>NFPA 25\textsuperscript{153}</td>
<td><em>Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems</em></td>
<td>2017</td>
</tr>
<tr>
<td>NFPA 70\textsuperscript{39}</td>
<td><em>National Electrical Code</em></td>
<td>2002</td>
</tr>
<tr>
<td>NFPA 72\textsuperscript{36}</td>
<td><em>National Fire Alarm Code</em></td>
<td>2002</td>
</tr>
<tr>
<td>NFPA 80</td>
<td><em>Standard for Fire Doors and Fire Windows</em>\textsuperscript{155}</td>
<td>1999</td>
</tr>
<tr>
<td>NFPA 90A\textsuperscript{32}</td>
<td><em>Standard for the Installation of Air-Conditioning and Ventilating Systems</em></td>
<td>2002</td>
</tr>
<tr>
<td>NFPA 101\textsuperscript{27}</td>
<td><em>Life Safety Code</em></td>
<td>2000</td>
</tr>
<tr>
<td>NFPA 221\textsuperscript{34}</td>
<td><em>Standard for High Challenge Fire Walls, Fire Walls, and Fire Barrier Walls</em></td>
<td>2000</td>
</tr>
<tr>
<td>NFPA 780</td>
<td><em>Standard for the Installation of Lightning Protection Systems</em>\textsuperscript{156}</td>
<td>2000</td>
</tr>
<tr>
<td>NFPA 801\textsuperscript{154}</td>
<td><em>Standard for Fire Protection for Facilities Handling Radioactive Materials</em></td>
<td>2003</td>
</tr>
</tbody>
</table>

### 4.0 REFERENCES


17 J-JQ-J-0005 SH2, **SWPF Fire Protection Fire Alarm Riser Diagram Signaling Line Circuit Loop 1 and Loop 2 (U)**. Parsons, Aiken, South Carolina.

18 J-JQ-J-0005 SH3, **SWPF Fire Protection Fire Alarm Riser Diagram Signaling Line Circuit Loop 1 and Loop 2 (U)**. Parsons, Aiken, South Carolina.

19 J-JQ-J-0005 SH4, **SWPF Fire Protection Fire Alarm Riser Diagram Signaling Line Circuit Loop 1 and Loop 2 (U)**. Parsons, Aiken, South Carolina.

20 J-JQ-J-0005 SH5, **SWPF Fire Protection Fire Alarm Riser Diagram Signaling Line Circuit Loop 1 and Loop 2 (U)**. Parsons, Aiken, South Carolina.

21 M-MV-J-0001, **Valve List**. Parsons, Aiken, South Carolina.

22 J-JX-J-0001, **Instrumentation Instrument Reference**. Parsons, Aiken, South Carolina.

23 M-MX-J-00010, **Specialty Item List**. Parsons, Aiken, South Carolina.


25 F-ESR-J-00005, **SWPF Fire Protection Engineering Equivalency Request Omission of Sprinklers in Waste Transfer Enclosure; West Utility Chase; HVAC Shielding Chase; South Utility Chase and Contactor Support Floor Chase; and East CSSX Tank Cell**. Parsons, Aiken, South Carolina.


37 C-CY-J-0025, SWPF Civil Fire Protection Piping Plan SWPF Operations Area (U). Parsons, Aiken, South Carolina.

38 *Salt Waste Processing Facility Project Procedures Manual*. Parsons, Aiken, South Carolina


40 P-PF-J-0001, SWPF Process Building Fire Protection Central Process Area Floor Plan at EL 88’-6”, 92’-0” and 100’-0” (U). Parsons, Aiken, South Carolina.

41 P-PF-J-0010, SWPF Compressor Building Fire Protection Floor Plan at Elevation 100’-0” (U). Parsons, Aiken, South Carolina.

42 P-PF-J-0002, SWPF Process Building Fire Protection Cold Chemicals Area Floor Plan at EL 100’-0” (U). Parsons, Aiken, South Carolina.

43 P-PF-J-0003, SWPF Process Building Fire Protection Northern Facility Support Area Floor Plan at EL 100’-0” (U). Parsons, Aiken, South Carolina.

44 P-PF-J-0004, SWPF Process Building Fire Protection Eastern Facility Support Area Floor Plan at EL 100’-0” (U). Parsons, Aiken, South Carolina.

45 P-PF-J-0005, SWPF Process Building Fire Protection Alpha Finishing Facility Floor Plan at EL 95’-0” and 100’-0” (U). Parsons, Aiken, South Carolina.

46 P-PF-J-0006, SWPF Process Building Fire Protection Central Process Area Floor Plan at EL 108’-0” and 116’-0” (U). Parsons, Aiken, South Carolina.

47 P-PF-J-0007, SWPF Process Building Fire Protection Central Process Area Floor Plan at EL 124’-0” (U). Parsons, Aiken, South Carolina.

48 P-PF-J-0008, SWPF Process Building Fire Protection Central Process Area Floor Plan at EL 139’-0” (U). Parsons, Aiken, South Carolina.


J-JF-J-0001, SWPF Process Building Fire Detection and Alarm System Location Index Key Plan, Elevation 100’-0” (U). Parsons, Aiken, South Carolina.


J-JF-J-00030, SWPF Process Building Fire Detection and Alarm System Location Plan, Elevation 139’-0” (U). Parsons, Aiken, South Carolina.

J-JF-J-00037, SWPF Compressor Building Fire Detection and Alarm System Location Plan, Elevation 100’-0” (U). Parsons, Aiken, South Carolina.

J-JF-J-0005, SWPF Process Building Fire Detection and Alarm System Process Area Control Room, SSFT and SEHT Cells Location Plan at EL 100’-0” (U). Parsons, Aiken, South Carolina.


J-JF-J-0007, SWPF Process Building Fire Detection and Alarm System Process Area North ASP Pump and Valve Gallery, ASDT and SSRT/WWHT Cells Location Plan at EL 100’-0” (U). Parsons, Aiken, South Carolina.

J-JF-J-0008, SWPF Process Building Fire Detection and Alarm System CSSX Cell CSSX Pump and Valve Gallery and CSSX West Tank Cell Location Plan at EL 100’-0” (U). Parsons, Aiken, South Carolina.

J-JF-J-0009, SWPF Process Building Fire Detection and Alarm System CSSX Cell CSSX Pump and Valve Gallery and East CSSX Tank Cell Location Plan at EL 100’-0” (U). Parsons, Aiken, South Carolina.

J-JF-J-0010, SWPF Process Building Fire Detection and Alarm System CSSX Cell ASP CSSX Pump and Valve Gallery and Decon Area Location Plan at EL 100’-0” (U). Parsons, Aiken, South Carolina.

J-JF-J-0011, SWPF Process Building Fire Detection and Alarm System Cold Chemicals Area Location Plan EL 100’-0” (U). Parsons, Aiken, South Carolina.
64 J-JF-J-0012, SWPF Process Building Fire Detection and Alarm System Cold Chemicals Area Location Plan EL 100'-'0" (U). Parsons, Aiken, South Carolina.

65 J-JF-J-0013, SWPF Process Building Fire Detection and Alarm System Facility Support Area Electrical Room Location Plan at EL 100'-'0" (U). Parsons, Aiken, South Carolina.

66 J-JF-J-0014, SWPF Process Building Fire Detection and Alarm System Facility Support Area Mechanical Room Location Plan at EL 100'-'0" (U). Parsons, Aiken, South Carolina.

67 J-JF-J-0015, SWPF Process Building Fire Detection and Alarm System Facility Support Area Break Room and Locker Rooms Location Plan at EL 100'-'0" (U). Parsons, Aiken, South Carolina.

68 J-JF-J-0016, SWPF Process Building Fire Detection and Alarm System Facility Support Area Truck Bay and Offices Location Plan at EL 100'-'0" (U). Parsons, Aiken, South Carolina.

69 J-JF-J-0017, SWPF Process Building Fire Detection and Alarm System Facility Support Area Truck Bay, General Maintenance Shop and Health Physics Location Plan at EL 100'-'0" (U). Parsons, Aiken, South Carolina.


71 J-JF-J-0019, SWPF Process Building Fire Detection and Alarm System Alpha Finishing Facility AFF, Electrical and AHU Rooms Location Plan at EL 100'-'0" (U). Parsons, Aiken, South Carolina.

72 J-JF-J-0020, SWPF Process Building Fire Detection and Alarm System Alpha Finishing Facility AFF and HEPA Filter Room Location Plan at EL 100'-'0". Parsons, Aiken, South Carolina.


94 A-A2-J-0007, SWPF Process Building Architectural Central Process Area Plan At Elevation 100'-0" (Unless Otherwise Noted) (U). Parsons, Aiken, South Carolina.

95 A-A2-J-0008, SWPF Process Building Architectural - Cold Chemicals Area Plan At Elevation 100'-0" (U). Parsons, Aiken, South Carolina.

96 A-A2-J-0009, SWPF Process Building Architectural Northern Facility Support Area Plan At Elevation 100'-0" (U). Parsons, Aiken, South Carolina.

97 A-A2-J-0010, SWPF Process Building Architectural Eastern Facility Support Area Plan At Elevation 100'-0" (U). Parsons, Aiken, South Carolina.

98 A-A2-J-0011, SWPF Process Building Architectural Alpha Finishing Facility Plan Elevation 100'-0" (Unless Otherwise Noted) (U). Parsons, Aiken, South Carolina.


100 A-A2-J-0013, SWPF Process Building Architectural Central Process Area Plan At Elevation 124'-0" (U). Parsons, Aiken, South Carolina.

101 A-A2-J-0014, SWPF Process Building Architectural Central Process Area Plan At Elevation 139'-0" (U). Parsons, Aiken, South Carolina.


103 A-A5-J-0004, SWPF Process Building Architectural Door and Window Schedule (U). Parsons, Aiken, South Carolina.

104 E-EL-J-0001, SWPF Process Building Electrical Lighting Key Plan EL 100'-0" (U). Parsons, Aiken, South Carolina.

105 E-EL-J-0002, SWPF Process Building Electrical Lighting Key Plan EL 116'-0" (U). Parsons, Aiken, South Carolina.

106 E-EL-J-0003, SWPF Process Building Electrical Lighting Key Plan EL 124'-0" (U). Parsons, Aiken, South Carolina.
107 E-EL-J-0004, *SWPF Process Building Electrical Lighting Key Plan EL 139'-0" (U).* Parsons, Aiken, South Carolina.

108 E-EL-J-0005, *SWPF Process Building Electrical Central Process Area Lighting Plan EL 100'-0" (U).* Parsons, Aiken, South Carolina.

109 E-EL-J-0006, *SWPF Process Building Electrical CSSX Cell Lighting Plan EL 100'-0" (U).* Parsons, Aiken, South Carolina.

110 E-EL-J-0007, *SWPF Process Building Electrical Cold Chemicals Area Lighting Plan EL 100'-0" (U).* Parsons, Aiken, South Carolina.

111 E-EL-J-0008, *SWPF Process Building Electrical Northern Facility Support Area Lighting Plan EL 100'-0" (U).* Parsons, Aiken, South Carolina.

112 E-EL-J-0009, *SWPF Process Building Electrical Eastern Facility Support Area Lighting Plan EL 100'-0" (U).* Parsons, Aiken, South Carolina.

113 E-EL-J-0010, *SWPF Process Building Electrical Alpha Finishing Facility Lighting Plan EL 95'-0" and 100'-0" (U).* Parsons, Aiken, South Carolina.

114 E-EL-J-0011, *SWPF Process Building Electrical Central Process Area Lighting Plan EL 116'-0" (U).* Parsons, Aiken, South Carolina.

115 E-EL-J-0012, *SWPF Process Building Electrical CSSX Cell Lighting Plan EL 116'-0" (U).* Parsons, Aiken, South Carolina.

116 E-EL-J-0013, *SWPF Process Building Electrical Central Process Area & CSSX Cell Lighting Plan EL 124'-0" (U).* Parsons, Aiken, South Carolina.

117 E-EL-J-0014, *SWPF Process Building Electrical Central Process Area Lighting Plan EL 139'-0" (U).* Parsons, Aiken, South Carolina.

118 E-EL-J-0015, *SWPF Process Building Electrical CSSX Cell Lighting Plan EL 139'-0" (U).* Parsons, Aiken, South Carolina.

119 E-EL-J-0016, *SWPF Process Building Electrical Cold Chemicals Area Light Lowering System Plan EL 100'-0" (U).* Parsons, Aiken, South Carolina.

120 P-PB-J-00001, *SWPF Process Building Material Handling General Arrangement Laboratory Plan and Section (U).* Parsons, Aiken, South Carolina.

121 P-PH-J-0010, *SWPF Process Building HVAC Central Process Area Control Room Floor Plan at EL 100'-0" (U).* Parsons, Aiken, South Carolina.
122 P-PH-J-0012, SWPF Process Building HVAC Central Process Area North ASP P&V Gallery and Controlled Entry Area Floor Plan at EL 100'-0" (U). Parsons, Aiken, South Carolina.

123 P-PH-J-0015, SWPF Process Building HVAC Central Process Area SSRT/WWHT Cell and Material Staging and Storage Area Floor Plan at EL 100'-0" (U). Parsons, Aiken, South Carolina.

124 P-PH-J-0018, SWPF Process Building HVAC Central Process Area South ASP Pump and Valve Gallery and Drum Off/Decon Area Floor Plan at EL 100'-0" (U). Parsons, Aiken, South Carolina.

125 P-PH-J-0019, SWPF Process Building HVAC Northern Facility Support Area Electrical Room Floor Plan - EL 100'-0" (U). Parsons, Aiken, South Carolina.

126 P-PH-J-0020, SWPF Process Building HVAC Northern Facility Support Area Mechanical Room Floor Plan at EL 100'-0" (U). Parsons, Aiken, South Carolina.

127 P-PH-J-0021, SWPF Process Building HVAC Northern Facility Support Area L Break Room Floor Plan at EL 100'-0" (U). Parsons, Aiken, South Carolina.

128 P-PH-J-0022, SWPF Process Building HVAC Eastern Facility Support Area Administrative Offices Floor Plan at EL 100'-0 (U). Parsons, Aiken, South Carolina.

129 P-PH-J-0027, SWPF Process Building HVAC Alpha Finishing Facility Floor Plan at EL 95'-0" and 100'-0" (U). Parsons, Aiken, South Carolina.

130 P-PH-J-0028, SWPF Process Building HVAC Alpha Finishing Facility Floor Plan at EL 95'-0" and 100'-0" (U). Parsons, Aiken, South Carolina.

131 P-PH-J-0029, SWPF Process Building HVAC Central Process Area Exhaust HEPA Filter Room Floor Plan at EL 116'-0" (U). Parsons, Aiken, South Carolina.

132 P-PH-J-0031, SWPF Process Building HVAC Central Process Area Exhaust Fan Room Floor Plan at EL 116'-0" (U). Parsons, Aiken, South Carolina.

133 P-PH-J-0032, SWPF Process Building HVAC Central Process Area SSFT and SEHT Cell Floor Plan at EL 116'-0" (U). Parsons, Aiken, South Carolina.

134 P-PH-J-0034, SWPF Process Building HVAC Central Process Area SSRT/WWHT Cell and Filter Drop Access Area Floor Plan at EL 116'-0" (U). Parsons, Aiken, South Carolina.

135 P-PH-J-0035, SWPF Process Building HVAC Central Process Area CSSX Contactor Support Floor Floor Plan at EL 116'-0" (U). Parsons, Aiken, South Carolina.
136 P-PH-J-0038, SWPF Process Building HVAC Central Process Area CSSX Contactor Operating Deck Floor Plan at EL 124'-0" (U). Parsons, Aiken, South Carolina.

137 P-PH-J-0040, SWPF Process Building HVAC Central Process Area Cell Inlet Air HEPA Filter Room #1 Floor Plan at EL 139'-0" (U). Parsons, Aiken, South Carolina.

138 P-PH-J-0043, SWPF Process Building HVAC Central Process Area Operating Deck Floor Plan at EL 139'-0" (U). Parsons, Aiken, South Carolina.

139 P-PH-J-0044, SWPF Process Building HVAC Central Process Area Operating Deck Floor Plan at EL 139'-0" (U). Parsons, Aiken, South Carolina.

140 P-PH-J-0045, SWPF Process Building HVAC Central Process Area Operating Deck Floor Plan at EL 139'-0" (U). Parsons, Aiken, South Carolina.

141 P-PH-J-00086, SWPF Process Building HVAC Details (U). Parsons, Aiken, South Carolina.

142 P-PH-J-00089, SWPF Process Building HVAC Central Process Area Control Room Floor Plan at EL 100'-0" (U). Parsons, Aiken, South Carolina.

143 P-PH-J-00090, SWPF Process Building HVAC Northern Facility Support Area Locker Rooms Floor Plan at EL 100'-0" (U). Parsons, Aiken, South Carolina.

144 P-PH-J-00091, SWPF Process Building HVAC Northern Facility Support Area Locker Rooms and Admin Offices Floor Plan at EL 100'-0" (U). Parsons, Aiken, South Carolina.

145 P-PH-J-00094, SWPF Process Building HVAC Eastern Facility Support Area Maintenance Areas Floor Plan at EL 100'-0" (U). Parsons, Aiken, South Carolina.

146 P-PH-J-00095, SWPF Process Building HVAC Cold Chemicals Area Floor Plan at EL 100'-0” (U). Parsons, Aiken, South Carolina.

147 P-PH-J-00096, SWPF Process Building HVAC Central Process Area Exhaust HEPA Filter and Fan Room Floor Plan at EL 116'-0" (U). Parsons, Aiken, South Carolina.

148 P-PH-J-00097, SWPF Process Building HVAC Central Process Area HVAC HEPA Filter Staging Area Floor Plan at EL 116'-0” (U). Parsons, Aiken, South Carolina.

149 P-PH-J-00098, SWPF Process Building HVAC Central Process Area PVVS/PMVS and Laboratory Vent Room Floor Plan at EL 139'-0" (U). Parsons, Aiken, South Carolina.

150 P-PH-J-00099, SWPF Process Building HVAC Central Process Area PVVS/PMVS Fan Room and PVVS/PMVS Staging Area FLR Plan at EL 139'-0” (U). Parsons, Aiken, South Carolina.

V-ESR-J-00012, Emergency Response Interface Control Document (ICD-12), Revision 6. Parsons, Aiken, South Carolina


