# Chapter 9 Auxiliary Systems

## 9.1 Fuel Storage and Handling

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

### 9.1.4 Light Load Handling System (Related to Refueling)

#### 9.1.4.13 Refueling Operations

Add the following paragraphs at the end of this section.

**STD COL 9.1.6-4-A**

Section 13.5 requires development of fuel handling procedures. Fuel handling procedures address the status of plant systems required for refueling; inspection of replacement fuel and control rods; designation of proper tools; proper conditions for spent fuel movement and storage; proper conditions to prevent inadvertent criticality; proper conditions for fuel cask loading and movement; and status of interlocks, reactor trip circuits and mode switches. These procedures provide instructions for use of refueling equipment, actions for core alterations, monitoring core criticality status, and accountability of fuel for refueling operations. **[START COM 9.1-001]** Fuel handling procedures are developed six months before fuel receipt to allow sufficient time for plant staff familiarization, to allow NRC staff adequate time to review the procedures, and to develop operator licensing examinations. **[END COM 9.1-001]**

Personnel qualifications and training for fuel handlers are addressed in Section 13.2.

#### 9.1.4.19 Inspection and Testing Requirements

Add the following paragraph at the end of this section.

**STD COL 9.1.6-4-A**

Section 17.5 describes the QA program that is applied to monitoring, implementing, and ensuring compliance with fuel handling procedures. As part of normal plant operations, the fuel-handling equipment is inspected for operating conditions before each refueling operation. During the operational testing of this equipment, procedures are followed that will affirm the correct performance of the fuel-handling system

interlocks. Other maintenance and test procedures are developed based on manufacturer's requirements.

### 9.1.5 Overhead Heavy Load Handling Systems (OHLHS)

### 9.1.5.6 Other Overhead Load Handling System

Add the following at the end of this section.

**STD COL 9.1.6-5-A**

**Special Lifting Devices**

For special lifting devices, the guidelines of ANSI N14.6 are implemented as specified with the following exceptions/clarifications:

- The acceptance criteria of paragraph 5.5.2 are applied to fabrication and repair welds only.
- The acceptance criteria for inservice inspection shall be limited to "No Cracks."
- The use of later editions of ASME Section V may be used to permit the use of advanced NDE technology.
- For the Dryer/Separator Strongback the requirement to routinely examine the load bearing welds every fifth refueling outage by nondestructive examination (NDE) (Magnetic Particle or Liquid Penetrant) will not be used. The lifting device shall be examined visually and dimensionally. The visual and dimensional examination shall be performed prior to the initial lift each outage. Any cracks in the coating or dimension out of tolerance shall require magnetic particle or liquid penetrant examination of the suspect welds and/or additional welds as required by Design Engineering.

**Other Lifting Devices**

Slings used for heavy load lifts meet the requirements specified for slings in ANSI B30.9 with the following clarification. Since dynamic loads constitute a small percentage of the total load imposed on slings, the sling's ratings are expressed in terms of maximum static load only.

### 9.1.5.8 Operational Responsibilities

Replace this section with the following.

**STD COL 9.1.6-5-A** **Procedures**

Section 13.5 requires the development of administrative procedures to control heavy loads prior to fuel load to allow sufficient time for plant staff familiarization, to allow NRC staff adequate time to review the procedures, and to develop operator licensing examinations. Heavy loads handling procedures address:

- Equipment identification
- Required equipment inspections and acceptance criteria prior to performing lift and movement operations
- Approved safe load paths and exclusion areas
- Safety precautions and limitations
- Special tools, rigging hardware, and equipment required for the heavy load lift
- Rigging arrangement for the load
- Adequate job steps and proper sequence for handing the load

Safe load paths are defined for movement of heavy loads to minimize the potential for a load drop on irradiated fuel in the reactor vessel or spent fuel pool or on safe shutdown equipment. Paths are defined in procedures and equipment layout drawings. Safe load path procedures address the following general requirements:

- When heavy loads must be carried directly over the spent fuel pool, reactor vessel or safe shutdown equipment, procedures will limit the height of the load and the time the load is carried.
- When heavy loads could be carried (i.e., no physical means to prevent) but are not required to be carried directly over the spent fuel pool, reactor vessel or safe shutdown equipment, procedures will define an area over which loads shall not be carried so that if the load is dropped, it will not result in damage to spent fuel or operable safe shutdown equipment or compromise reactor vessel integrity.
- Where intervening structures are shown to provide protection, no load travel path is required.
- Defined safe load paths will follow, to the extent practical, structural floor members.
- When heavy loads movement is restricted by design or operational limitation, no safe load path is required.

- Supervision is present during heavy load lifts to enforce procedural requirements.

**Inspection and Testing**

Cranes addressed in this section are inspected, tested, and maintained in accordance with Section 2-2 of ANSI B30.2, Section 11.2 of ANSI B30.11, or Sections 16-1.2.1 and 16-1.2.3 of ANSI B30.16 with the exception that tests and inspections may be performed prior to use for infrequently used cranes. Prior to making a heavy load lift, an inspection of the crane is made in accordance with the above applicable standards.

**Training and Qualification**

Training and qualification of operators of cranes addressed in this section meet the requirements of ANSI B30.2, and include the following:

- Knowledge testing of the crane to be operated in accordance with the applicable ANSI crane standard.
- Practical testing for the type of crane to be operated.
- Supervisor signatory authority on the practical operating examination.
- Applicable physical requirements for crane operators as defined in the applicable crane standard.

**Quality Assurance**

Procedures for control of heavy loads are developed in accordance with Section 13.5. In accordance with Section 17.5, other specific quality program controls are applied to the heavy loads handling program, targeted at those characteristics or critical attributes that render the equipment a significant contributor to plant safety.

### 9.1.5.9 Safety Evaluations

Add the following paragraph at the end of this section.

**STD COL 9.1.6-5-A**

No heavy loads are identified that are outside the scope of the certified design.

### 9.1.6 COL Information

#### 9.1.6-4-A Fuel Handling Operations

**STD COL 9.1.6-4-A** This COL item is addressed in Subsection 9.1.4.13 and Subsection 9.1.4.19.

#### 9.1.6-5-A Handling of Heavy Loads

**STD COL 9.1.6-5-A** This COL item is addressed in Subsection 9.1.5.6, Subsection 9.1.5.8, and Subsection 9.1.5.9.

## 9.2 Water Systems

### 9.2.1 Plant Service Water System

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

#### 9.2.1.2 System Description

**Summary Description**

Replace the Summary Description with the following information.

**EF3 CDI** The Plant Service Water System (PSWS) rejects heat from nonsafety-related RCCWS and TCCWS heat exchangers to the environment. The source of cooling water to the PSWS is from either the normal power heat sink (NPHS) or the auxiliary heat sink (AHS). A natural draft cooling tower is utilized for the NPHS and mechanical draft cooling towers are utilized for the AHS with a crosstie line to permit routing of the plant service water to either heat sink. Table 9.2-201 provides information on the PSWS cooling tower design characteristics.

**EF3 CDI** A simplified diagram of the PSWS is shown in DCD Figure 9.2-1.

**Detailed System Description**

In the sixth paragraph, replace the last sentence with the following information.

**EF3 COL 9.2.1-1-A** Materials for the various components of the PSWS are selected to preclude long-term corrosion and fouling of the PSWS based on site water quality. Fiberglass reinforced polyester pipe is used for buried

PSWS piping to preclude long-term corrosion. Appropriate chemical treatment is added to the NPHS or the AHS, as required to preclude long-term corrosion and fouling of the PSWS based on site water quality analysis.

Replace the eighth paragraph with the following information.

**EF3 CDI**

Fermi 3 design heat loads are shown in DCD Table 9.2-1.The PSWS component design characteristics are shown in Table 9.2-201.

Delete the last paragraph.

**Operation**

Add the following text to the end of the second paragraph of this section.

During operation, PSWS flow is directed to either the NPHS cooling tower or the AHS cooling towers where heat removed from the RCCWS and TCCWS is rejected. During the mode of operation using the NPHS, the NPHS basin provides makeup to the AHS basin. During the mode of operation using the AHS, makeup to the AHS basin is provided from the Station Water System (SWS).

### 9.2.1.6 COL Information

#### 9.2.1-1-A Material Selection

**EF3 COL 9.2.1-1-A**

This COL item is addressed in Subsection 9.2.1.2.

## 9.2.2 Reactor Component Cooling Water System

This section of the referenced DCD is incorporated by reference with no departures or supplements.

## 9.2.3 Makeup Water System

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

### 9.2.3.2 System Description

Replace the introductory text and the Demineralization Subsystem portions of this section with the following.

**EF3 CDI**

The MWS consists of two subsystems: 1) the demineralization subsystem and 2) the storage and transfer subsystem. The makeup water transfer pumps and the demineralization subsystem are sized to meet the demineralized water needs of all operational conditions except for shutdown/refueling. During the shutdown/refueling mode, the increases in plant water consumption may require use of a temporary demineralization subsystem and temporary makeup water transfer pumps to be used as a supplemental water source.

The MWS major equipment is housed entirely in the Service Water/Water Treatment Building except for the demineralized water storage tank (which is outdoors and adjacent to this building) and the distribution piping to the interface systems. Freeze protection is provided for the demineralized water storage tank and piping exposed to freezing conditions.

The MWS equipment and associated piping in contact with demineralized water are fabricated from corrosion resistant materials such as stainless steel to prevent contamination of the makeup water.

Table 9.2-202 lists the major MWS components.

**Demineralization Subsystem**

Feedwater for the demineralization subsystem is provided by the Frenchtown Township municipal water system. Production of demineralized water by the demineralization subsystem can be initiated and shut down either automatically (based on the demineralized water storage tank level) or manually. Feedwater is treated in the following sequence:

1. Activated carbon filters
2. Reverse osmosis modules
3. Mixed bed demineralizers

Each reverse osmosis (RO) module includes cartridge filters. The RO modules are separated by an inter-stage break tank. Chemical addition is provided upstream of the RO module cartridge filters as required. High pressure pumps provide the pressure required for flow through the RO unit membranes. The RO unit reject flow is sent to the blowdown. The RO product water is temporarily stored in an RO product water storage tank before being pumped by one of the forwarding pumps to the mixed

bed demineralizer unit. Operation of the RO high-pressure pumps is interlocked with that of the forwarding pumps. The mixed bed demineralizer consists of both strong cation and anion resins in the same vessel that polishes the RO product water. The mixed bed unit effluent is monitored for water quality. This effluent is automatically recirculated to the pretreated source water storage tank until the water quality requirements are met. Makeup water is then delivered to the MWS demineralized water storage tank. The modular design of the RO unit and the mixed bed unit allows continuous demineralized water production. Cleaning, back flushing, or module removal are manual operations based on elevated differential pressure across the module or total flow through the system. No regeneration of mixed bed modules is performed on-site.

### 9.2.4 Potable and Sanitary Water System

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

Replace the information in this section with the following information.

#### 9.2.4.1 Design Bases

**Safety Design Basis**

**EF3 CDI**

The Potable Water System (PWS) and Sanitary Waste Discharge System (SWDS) do not perform any safety-related function. Therefore, the PWS and SWDS have no safety design bases.

**Power Generation Design Basis**

The Potable and Sanitary Waste Discharge Systems are designed to provide potable water supplies and sewage treatment necessary for normal plant operation and shutdown periods. The PWS provides sufficient supply and is designed to supply 12.6 liters per second (200 gallons per minute) of potable water during peak demand periods. The PWS is designed to produce and maintain the quality of water required by the authorities having jurisdiction.

### 9.2.4.2 System Description

**Potable Water System**

The PWS consists of pumps, water heaters, and interconnecting piping and valves as shown on Figure 9.2-201. PWS component characteristics are shown in Table 9.2-203. Treated water from the Frenchtown Township system is supplied to the potable water storage tank. In addition to non-radiological areas, potable water is provided to areas where inadvertent backflow into the system could result in radiological contamination of the potable water. For those branches with outlets in areas where the potential for radiological contamination exists, backflow prevention is provided through the installation of backflow preventers.

**Sanitary Waste Discharge System**

The SWDS consists of waste basin, wet well, septic tank, settling tank, wet well pumps, sewage discharge pumps and associated valves, piping and controls. Sewage is pumped from the septic tank to the Frenchtown Township Sewage Treatment facility. Since the effluent from the SWDS is routed to a water treatment facility, and not discharged to the environment, it is not necessary for the effluent to meet federal, state and local permits. A simplified diagram of the SWDS is shown in Figure 9.2-202.

### 9.2.4.3 Safety Evaluation

**Potable Water System**

The PWS has no safety-related function and is not connected to any safety-related structure, system or component. Failure of the system does not compromise any safety-related equipment or component and does not prevent safe shutdown of the plant. The PWS does not handle radioactive fluids. It is neither connected to, nor does it interface with any system that may contain radioactive fluids.

**Sanitary Waste Discharge System**

The SWDS has no safety-related function and is not connected to any safety related system or component. Failure of the system does not compromise any safety-related equipment or component and does not prevent safe shutdown of the plant.

The SWDS is not designed to handle radioactive fluids. It is neither connected to, nor does it interface with, any system that may contain radioactive fluids. SWDS effluent is monitored as described in Table 11.5-201. In the event radioactivity is detected above present limits, controls are in place to prevent offsite disposal of sewage sludge prior to on-site evaluation of potential radiological contamination and treatment when contamination is beyond acceptable limits.

#### 9.2.4.4 Testing and Inspection Requirements

The PWS and SWDS are proven operable by their use during normal plant operation.

#### 9.2.4.5 Instrumentation Application

The PWS and SWDS are furnished with instrumentation that permit local and/or remote monitoring and control of each of the respective processes. This instrumentation includes meters, switches, indicators, pressure gauges, flow switches, composite samplers, transmitters, controllers, and valves required for service, operation, and protection of plant personnel and equipment.

## 9.2.5 Ultimate Heat Sink

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

Replace the second to last sentence in the seventh paragraph with the following.

**STD COL 9.2.5-1-A** Procedures that identify and prioritize available makeup sources seven days after an accident, and provide instructions for establishing necessary connections, will be developed in accordance with the procedure development milestone in Section 13.5.

### 9.2.5.1 COL Information

#### 9.2.5-1-A Post 7 day Makeup to UHS

**STD COL 9.2.5-1-A** This COL item is addressed in Subsection 9.2.5.

### 9.2.6 Condensate Storage and Transfer System

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

#### 9.2.6.2 System Description

Add the following at the end of the first paragraph.

**STD SUP 9.2.6-1**

Freeze protection is provided for the CS&TS.

### 9.2.7 Chilled Water System

This section of the referenced DCD is incorporated by reference with no departures or supplements.

### 9.2.8 Turbine Component Cooling Water System

This section of the referenced DCD is incorporated by reference with no departures or supplements.

### 9.2.9 Hot Water System

This section of the referenced DCD is incorporated by reference with no departures or supplements.

### 9.2.10 Station Water System

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

#### 9.2.10.2 System Description

Replace the Detailed System Description portion of this section with the following.

**EF3 CDI**

**Detailed System Description**

The SWS consists of the following subsystems:

- Plant Cooling Tower Makeup System (PCTMS)
- Pretreated Water Supply System (PWSS)

The PCTMS provides makeup water to the cooling tower basins for both the PSWS (Subsection 9.2.1) and CIRC (Section 10.4). The supply of water makes up for losses resulting from evaporation, drift and blowdown

from the cooling towers. In addition, the PCTMS provides makeup water to replace water used for strainer backwashes. The PCTMS consists of a water source, pumps, strainers, connecting piping, valves and instrumentation. See Figure 9.2-203 for a simplified system diagram and Table 9.2-204 for component design parameters for the PCTMS.

The PWSS supplies water to the Fire Protection System (FPS) (Subsection 9.5.1) for filling the primary firewater tanks. In addition, the PWSS provides PSWS cooling tower makeup as an alternate to the PCTMS. The PWSS also provides water for the strainers. The PWSS consists of a water source, pumps, strainers, station water storage tank (SWST), connecting piping, valves and instrumentation. See Figure 9.2-204 for a simplified diagram and Table 9.2-205 for component parameters for the PWSS.

## Table 9.2-201 PSWS Component Design Characteristics

| | | |
|---|---|---|
| | **PSWS Pumps** | |
| | Type | Vertical, wet-pit, centrifugal turbine |
| | Quantity | 4 |
| | Capacity Each | 1.262 $m^3$/s (20,000 gpm) |
| | **Plant Service Water System[1]** | |
| | Flow (AHS or NPHS) | 2.524 $m^3$/s (40,000 gpm) |
| | **PSWS Mechanical-Draft Cooling Towers** | |
| **EF3 CDI** | Type | Mechanical draft, multi-cell, redundant dual speed, reversible fans |
| **EF3 CDI** | Quantity | 2 |
| | Heat Load Each[2] | [87.2 MW (2.98 x $10^8$ BTU/h)] |
| | Flow Rate (Water) Each | 2.524 $m^3$/s (40,000 gpm) |
| **EF3 CDI** | Ambient Wet Bulb Temperature | 22.8°C (73°F) |
| **EF3 CDI** | Approach Temperature | 8.3°C (15°F) |
| | Cold Leg Temperature | 31.1°C (88°F) |
| **EF3 SUP 9.2.1-1** | Basin Reserve Storage Capacity[1] | 2.4 million gallons |
| | **Strainers** | |
| | Type | Automatic cleaning, duplex, basket |
| | Quantity | 4 |

1. PSWS required to remove 2.02 x $10^7$ MJ (1.92 x $10^{10}$ BTU) for period of 7 days without active makeup.
2. Minimum heat load cooling towers need to be able to reject.

## Table 9.2-202 Major Makeup Water System Components

Two activated carbon filter feed pumps

One activated carbon filter unit consisting of multiple modules

Four 5 micron cartridge filters

Two first pass reverse osmosis (RO) high-pressure pumps

Two second pass RO booster pumps

Two second pass RO high-pressure pumps

One RO system consisting of multiple modules

One RO break tank

One chemical treatment system that provides chemical conditioning for the RO system

One chemical cleaning system for the RO membranes

## Table 9.2-203 Potable Water System Component Design Characteristics

| | |
|---|---|
| **Potable Water Pumps** | |
| Quantity | 2 |
| Capacity Each | 45.4 $m^3$/hr (200 gpm) |
| **Potable Water Jockey Pump** | |
| Quantity | 1 |
| Capacity | 2.3 $m^3$/hr (10 gpm) |
| **Potable Water Storage Tank** | |
| Quantity | 1 |
| Capacity | 75.7 $m^3$ (20,000 gal) |
| **Hot Water Tank** | |
| Quantity | 1 |
| Type | Electric Immersion Heater or On-demand in-line heaters |

## Table 9.2-204 Station Water System – Plant Cooling Tower Makeup System Component Design Parameters

| | |
|---|---|
| **Pumps** | |
| Type | Vertical, wet pit, centrifugal type |
| Quantity | 3 x 50% |
| Capacity each | Approximately 4,088 $m^3$/hr (18,000 gpm) |
| **Strainers** | |
| Type | Duplex, basket |
| Quantity | 6 |

## Table 9.2-205 Station Water System – Pretreated Water Supply System Component Design Parameters

| PWSS Pumps | |
|---|---|
| Type | Vertical, wet pit, centrifugal type |
| Quantity | 2 x 100% |
| Capacity each | Approximately 272 $m^3$/hr (1200 gpm) |
| **Strainers** | |
| Type | Duplex, basket |
| Quantity | 2 |

## Figure 9.2-201 Potable Water System Simplified Diagram

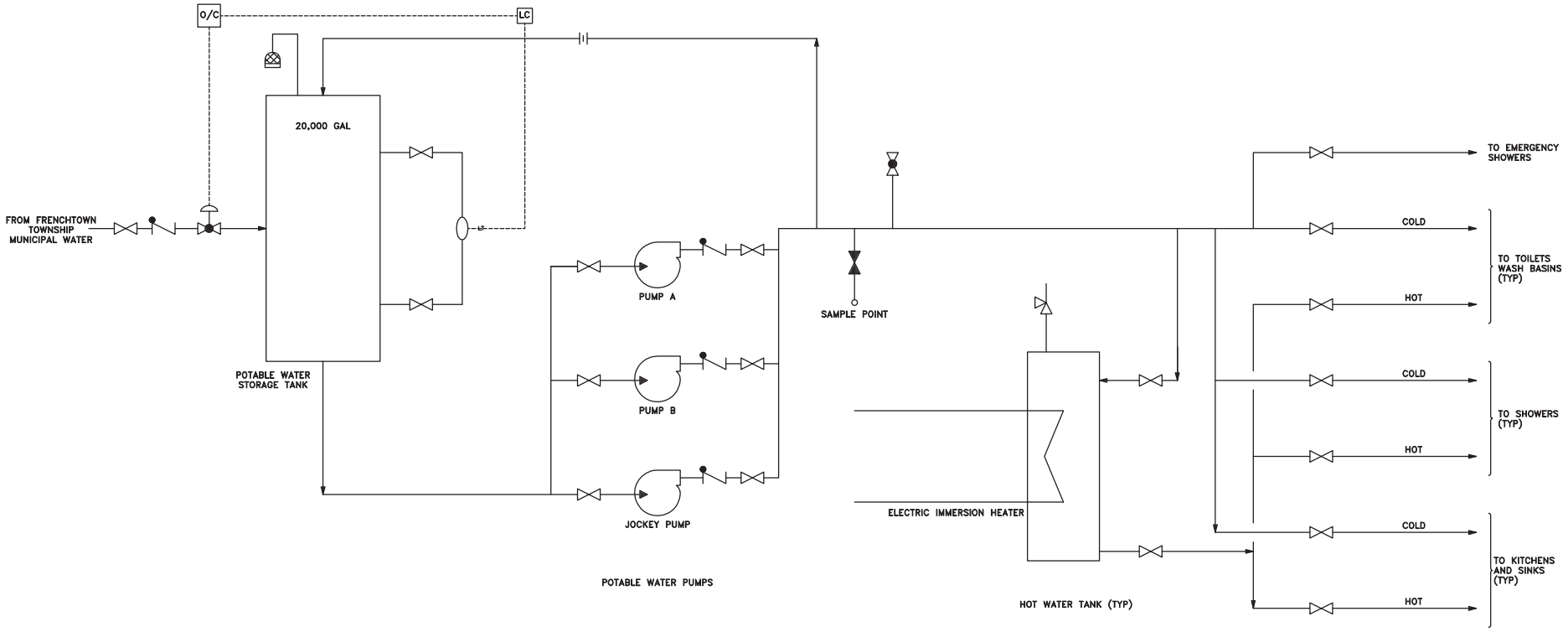


**Figure 9.2-202 Sanitary Waste Discharge System Simplified Diagram**

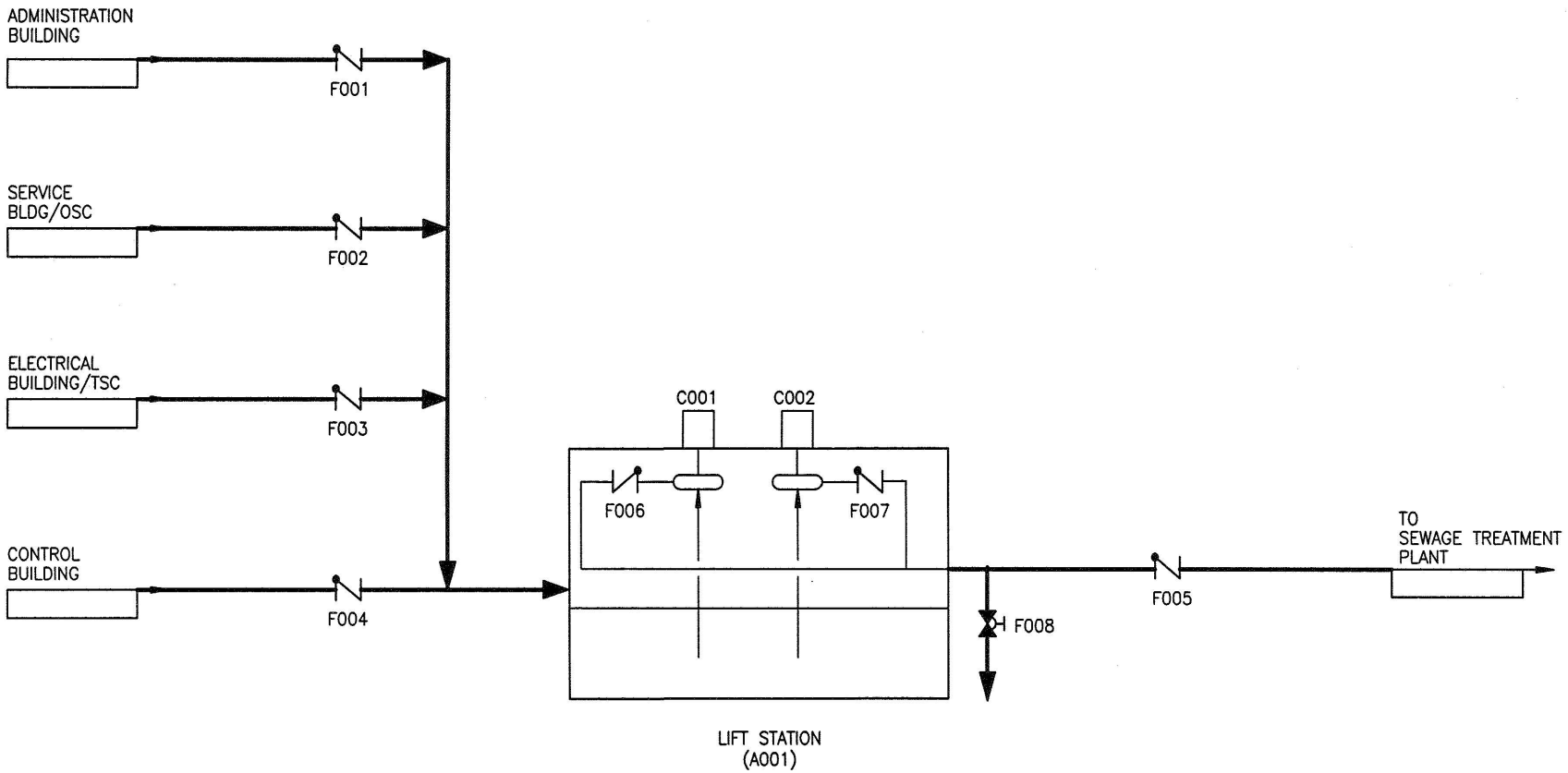


**Figure 9.2-203 Station Water System – Plant Cooling Tower Makeup System (PCTMS)**

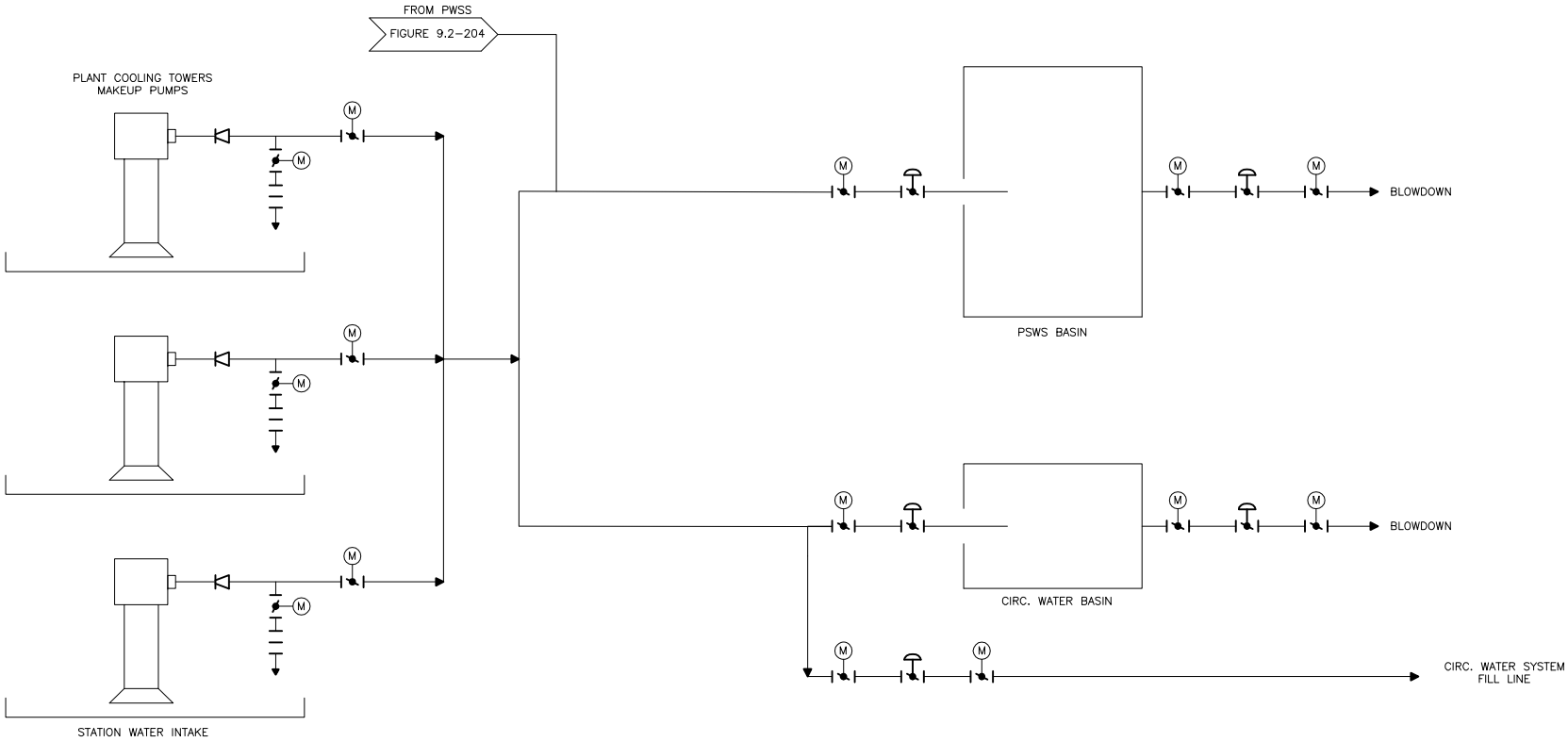
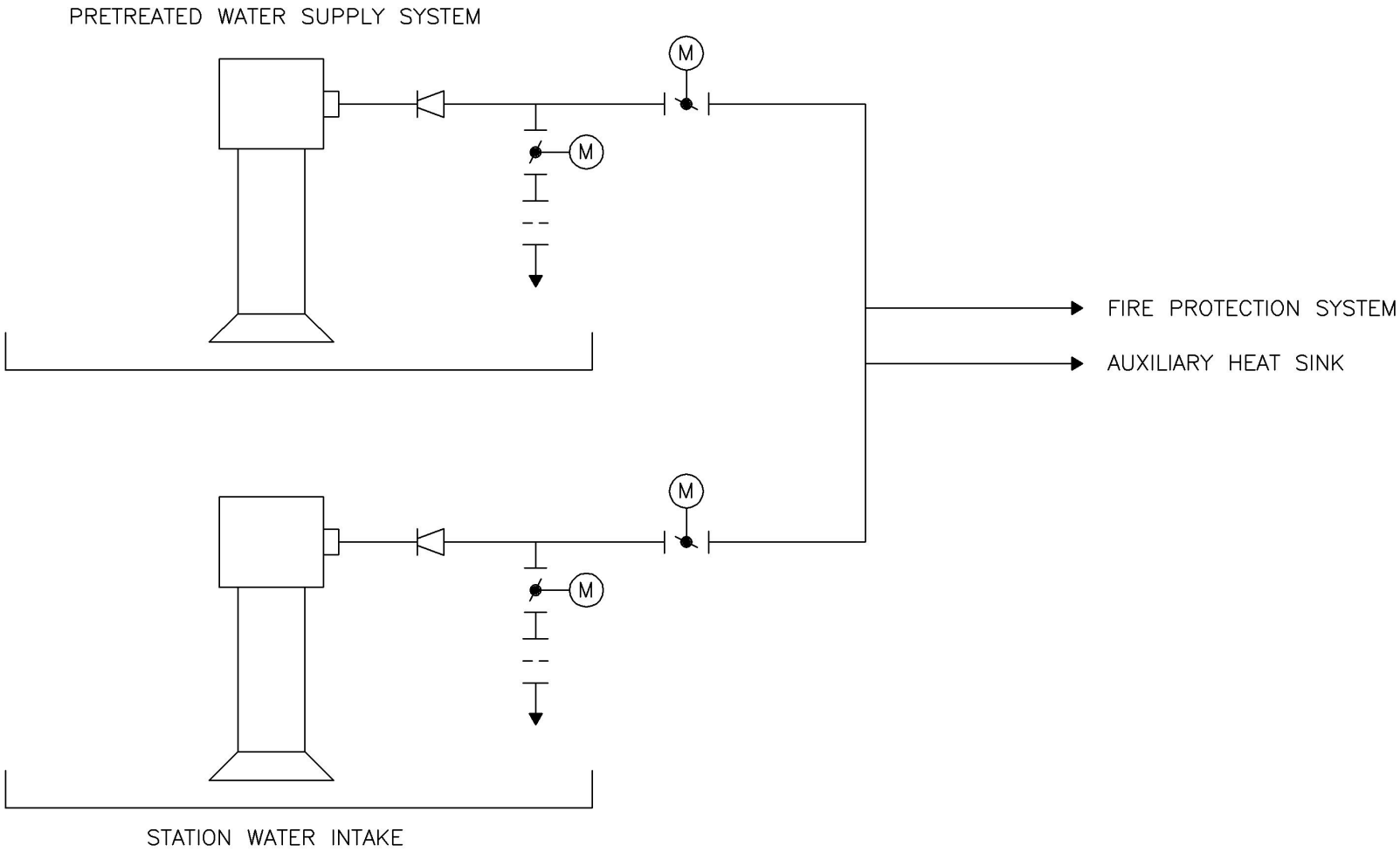


**Figure 9.2-204 Station Water System – Pretreated Water Supply System (PWSS)**



## 9.3 Process Auxiliaries

### 9.3.1 Compressed Air Systems

This section of the referenced DCD is incorporated by reference with no departures or supplements.

### 9.3.2 Process Sampling System

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

#### 9.3.2.2 System Description

Add the following at the end of this section.

**STD COL 9.3.2-1-A** **Post-Accident Sampling Program**

The post-accident sampling program consists of the following:

- Emergency Operating Procedures that rely on Emergency Action Levels, defined in the Emergency Plan, are used to classify fuel damage events. These procedures rely on installed post-accident radiation monitoring instrumentation described in DCD Section 7.5 and do not require the capability to obtain and analyze highly radioactive coolant samples although sample analyses may be used for classification as well.
- Plant procedures contain instructions for obtaining highly radioactive grab samples from the following:

  Reactor Coolant - from the RWCU/SDC sample line using the Reactor Building Sample Station. These samples can be analyzed for the parameters indicated in DCD Table 9.3-1. If coolant activity is greater than 1.0 Ci/ml, handling of the samples is delayed to avoid overexposure of personnel.

  Suppression Pool - from FAPCS sample line at the Reactor Building Sample Station. These samples can be analyzed for the parameters indicated in DCD Table 9.3-1. If coolant activity is greater than 1.0 Ci/ml, handling of the samples is delayed to avoid overexposure of personnel.

  Containment Atmosphere - may be taken as described in DCD Section 11.5.3.2.12 and analyzed for fission products.

- DCD Section 7.5.2.2 describes Containment Monitoring System operation in post-LOCA mode for gaseous sampling for $O_2$ and $H_2$.
- Effluent radiation monitoring is described in DCD Section 7.5. Field sampling and monitoring capability is maintained in accordance with the Emergency Plan.
- Post accident monitoring is adequate to implement the Emergency Plan without reliance on post accident sampling capability; therefore, the absence of a dedicated Post-Accident Sampling System does not reduce the effectiveness of the Emergency Plan.
- The post-accident sampling program meets the requirements of NUREG-0800, Section 9.3.2 for actions required in lieu of a Post Accident Sampling System.

9.3.2.6 **COL Information**

9.3.2-1-A **Post-Accident Sampling Program**

**STD COL 9.3.2-1-A** This COL item is addressed in Subsection 9.3.2.2.

9.3.3 **Equipment and Floor Drain System**

This section of the referenced DCD is incorporated by reference with no departures or supplements.

9.3.4 **Chemical and Volume Control System**

This section of the referenced DCD is incorporated by reference with no departures or supplements.

9.3.5 **Standby Liquid Control System**

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

9.3.5.2 **System Description**

**Detailed System Description**

Add the following to the end of the fifth paragraph.

**STD SUP 9.3.5-1** The above provisions adequately prevent loss of solubility of borated solutions (sodium pentaborate).

### 9.3.6 Instrument Air System

This section of the referenced DCD is incorporated by reference with no departures or supplements.

### 9.3.7 Service Air System

This section of the referenced DCD is incorporated by reference with no departures or supplements.

### 9.3.8 High Pressure Nitrogen Supply System

This section of the referenced DCD is incorporated by reference with no departures or supplements.

### 9.3.9 Hydrogen Water Chemistry System

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

Replace the first paragraph with the following.

**STD COL 9.3.9-1-A**

The site specific design includes HWCS.

#### 9.3.9.1 Design Basis

**Power Generation Design Basis**

Replace the first sentence with the following:

**STD CDI**

Hydrogen is added into the feedwater at the suction of the feedwater pumps and oxygen into the offgas system.

#### 9.3.9.2 System Description

Replace this section with the following.

**EF3 CDI**

The HWCS, illustrated in DCD Figure 9.3-5, is composed of hydrogen and oxygen supply systems to inject hydrogen in the feedwater and oxygen in the offgas and several monitoring systems to track the effectiveness of the HWCS. Storage requirements are based on the HWC system usage, ESBWR generator usage and estimated losses.

**EF3 COL 9.3.9-2-A**

The hydrogen supply system is integrated with the generator hydrogen supply system (as described in DCD Section 10.2.2.2.8).

**EF3 CDI**

9.3.9.2.1 **Hydrogen Storage Facility**

The bulk hydrogen storage facility stores liquid hydrogen in an 18,000 gallon vacuum-jacketed pressure vessel. The storage facility is located within a fenced area outside the plant protected area and is open to prevent the accumulation of hydrogen and meets the requirements of DCD References 9.3.9-1 and 9.3.9-2. The hydrogen storage facility consists of a cryogenic tank, cryogenic pumps, atmospheric vaporizers, a compressor, a high-pressure gas storage tubes bank, a hydrogen supply line, pressure regulating valves, an excess flow check valve, and relief valves. The cryogenic tank meets ASME Section VIII, Division 1, requirements for unfired pressure vessels. The pressure regulating valves limit the supply pressure of hydrogen; a relief valve is provided downstream of the regulating valve station to protect the downstream piping in case of regulating valve failure. The excess flow check valve ensures that a large release is limited to the storage facility location. The relief valves provide protection for the storage tank and each isolable liquid hydrogen filled piping section.

The HWCS is implemented with On-line Noble Chem™. Plant personnel conduct the OLNC process while the plant is operating.

The Oxygen Storage Facility is described in Subsection 9.3.10.2.

9.3.9.4 **Inspection and Testing Requirements**

Replace this section with the following.

**STD CDI**

The connections for the HWCS are tested and inspected with the feedwater and offgas piping.

Major components of the HWCS are tested and inspected as separate components prior to installation. The system is tested in accordance with vendor requirements after installation to ensure proper performance.

9.3.9.5 **Instrumentation and Controls**

Replace the first sentence with the following.

**STD CDI**

Instrumentation is provided to control the injection of hydrogen and augment the injection of oxygen.

9.3.9.6 **COL Information**

9.3.9-1-A **Implementation of Hydrogen Water Chemistry**

**STD COL 9.3.9-1-A**

This COL item is addressed in Subsection 9.3.9.

9.3.9-2-A **Hydrogen and Oxygen Storage and Supply**

**STD COL 9.3.9-2-A**

This COL item is addressed in Subsection 9.3.9.2.

9.3.10 **Oxygen Injection System**

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

9.3.10.2 **System Description**

Delete the last sentence of this section, and add the following at the end of this section.

**EF3 COL 9.3.10-1-A**

The bulk oxygen storage facility is located outside the plant fenced area. The facility consists of a 9,000 gallon cryogenic tank, atmospheric vaporizers, an oxygen supply line, a pressure regulating valve, an excess flow check valve, and relief valves. The pressure regulating valve limits the oxygen supply pressure. The excess flow check valve ensures that large releases are limited to the storage facility. The redundant relief valves provide protection for the storage tank and each isolable liquid oxygen filled piping section. The piping carrying gaseous oxygen from the storage facility to the turbine building is routed underground. The storage tank meets ASME Code Section VIII, Division 1, requirements for unfired pressure vessels, and DCD References 9.3.9-1 and 9.3.9-2.

9.3.10.6 **COL Information**

9.3.10-1-A **Oxygen Storage Facility**

**EF3 COL 9.3.10-1-A** This COL item is addressed in Subsection 9.3.10.2.

9.3.11 **Zinc Injection System**

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

9.3.11.2 **System Description**

Replace the second paragraph with the following.

**STD COL 9.3.11-1-A** A Zinc Injection System is not utilized.

9.3.11.4 **Test and Inspections**

Replace the second paragraph with the following.

**STD COL 9.3.11-2-A** A Zinc Injection System is not utilized.

9.3.11.6 **COL Information**

9.3.11-1-A **Determine Need for Zinc Injection System**

**STD COL 9.3.11-1-A** This COL item is addressed in Subsection 9.3.11.2.

9.3.11-2-A **Provide System Description for Zinc Injection System**

**STD COL 9.3.11-2-A** This COL item is addressed in Subsection 9.3.11.4.

9.3.12 **Auxiliary Boiler System**

This section of the referenced DCD is incorporated by reference with no departures or supplements.

## 9.4 Heating, Ventilation, and Air Conditioning

This section of the referenced DCD is incorporated by reference with the following departures or supplements.

### 9.4.2 Fuel Building HVAC System (FBVS)

Replace the information in this section with the following information.

**EF3 DEP 9.4-1**

The FBVS design is described in DCD Revision 5, Section 9.4.2 and associated tables and figures (Reference 9.4.2-201). The FBVS exhaust is directed to the RB/FB vent stack in lieu of the plant vent stack.

#### 9.4.2.1 References

9.4.2-201 GE-Hitachi Nuclear Energy, "ESBWR Design Control Document - Tier 2," Revision 5, May 2008.

### 9.4.3 Radwaste Building Heating, Ventilating and Air Conditioning System (RWVS)

Replace the information in this section with the following information.

**EF3 DEP 9.4-1**

The RWVS design is described in DCD Revision 5, Section 9.4.3 and associated tables and figures (Reference 9.4.3-201). The RWVS exhaust is directed to the RWB vent stack in lieu of the plant vent stack.

#### 9.4.3.1 References

9.4.3-201 GE-Hitachi Nuclear Energy, "ESBWR Design Control Document - Tier 2," Revision 5, May 2008.

### 9.4.4 Turbine Building HVAC System (TBVS)

Replace the information in this section with the following information.

**EF3 DEP 9.4-1**

The TBVS design is described in DCD Revision 5, Section 9.4.2 and associated tables and figures (Reference 9.4.4-201). The TBVS exhaust is directed to the TB vent stack in lieu of the plant vent stack.

#### 9.4.4.1 References

9.4.4-201 GE-Hitachi Nuclear Energy, "ESBWR Design Control Document - Tier 2," Revision 5, May 2008.

### 9.4.6 Reactor Building HVAC System (RBVS)

Replace the information in this section with the following information.

**EF3 DEP 9.4-1**

The RBVS design is described in DCD Revision 5, Section 9.4.2 and associated tables and figures (Reference 9.4.6-201). The RBVS exhaust is directed to the RB/FB vent stack in lieu of the plant vent stack.

#### 9.4.6.1 References

9.4.6-201 GE-Hitachi Nuclear Energy, "ESBWR Design Control Document - Tier 2," Revision 5, May 2008.

## 9.5 Other Auxiliary Systems

### 9.5.1 Fire Protection System

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

#### 9.5.1.1 Design Bases

**Codes, Standards, and Regulatory Guidance**

Add the following at the end of this section.

**EF3 SUP 9.5.1-1**

Table 9.5-201 supplements DCD Table 9.5-1 for those portions outside the DCD and operational aspects of the fire detection and suppression systems.

#### 9.5.1.2 System Description

Add the following sentence after the first sentence in the first paragraph.

**EF3 COL 9.5.1-4-A**

Figure 9.5-201 and DCD Table 9.5-1 provide simplified diagrams of the site-specific firewater supply piping.

### 9.5.1.4 Fire Protection Water Supply System

**Water Sources**

Replace the first paragraph with the following.

**EF3 COL 9.5.1-4-A**

As identified by DCD Table 9.5-1 and Figure 9.5-201, water for the Fire Protection System is supplied from a minimum of two sources: i) at least one “primary” source to the suctions of primary fire pumps and corresponding jockey fire pumps and, ii) at least one “secondary” source to suctions of secondary fire pumps and corresponding jockey fire pumps. The primary source is two dedicated, Seismic Category I, firewater storage tanks. Each primary firewater storage tank has sufficient capacity to meet the maximum firewater demand of the system for a period of 120 minutes.

**EF3 COL 9.5.1-1-A**

The secondary firewater source is Lake Erie. This large body of water has a capacity well in excess of the required 300,000 gallons required by NFPA 804. The water from Lake Erie is treated with sodium hypochlorite.

Water sources that are used for multiple purposes ensure that the required quantity of firewater is dedicated for fire protection use only.

**Fire Pumps**

Replace the sixth sentence in the first paragraph with the following.

**STD COL 9.5.1-2-A**

**[START COM 9.5-001]** Testing will be performed to demonstrate that the secondary fire protection pump circuit supplies a minimum of 484 m3/hr (2130 gpm) with sufficient discharge pressure to develop a minimum of 107 psig line pressure at the Turbine Building/yard interface boundary. This cannot be performed until the system is built. This activity will be completed prior to fuel receipt. **[END COM 9.5-001]**

### 9.5.1.5 Firewater Supply Piping, Yard Piping, and Yard Hydrants

Delete the last sentence in this section, and add the following sentence at the end of the first paragraph of this section.

**EF3 COL 9.5.1-4-A** Figure 9.5-201 and DCD Table 9.5-1 provide simplified diagrams of the site-specific firewater supply piping.

### 9.5.1.10 Fire Barriers

Replace the last paragraph with the following.

**STD COL 9.5.1-5-A** **[START COM 9.5-002]** Mechanical and electrical penetration seals and electrical raceway fire barrier systems are qualified to the requirements delineated in RG 1.189 by an independent testing laboratory in accordance with the applicable guidance of NFPA 251 and/or ASTM E-119. Detailed design in this area is not complete. Specific design and certification test results for penetration seal designs and electrical raceway fire barrier systems will be available for review at least six months prior to fuel receipt. **[END COM 9.5-002]**

### 9.5.1.11 Building Ventilation

Replace the last sentence in the third paragraph with the following.

**STD COL 9.5.1-6-H** **[START COM 9.5-003]** Procedures for manual smoke control will be developed as part of the Fire Protection Program implementation. **[END COM 9.5-003]** The required elements of the Fire Protection Program are fully operational prior to receipt of new fuel for buildings storing new fuel and adjacent fire areas that could affect the fuel storage area. Other required elements of the Fire Protection Program described in this section are fully operational prior to initial fuel loading per Section 13.4.

### 9.5.1.12 Safety Evaluation

Replace the fifth paragraph with the following.

**STD COL 9.5.1-7-H** **[START COM 9.5-004]** A compliance review of the as-built design against the assumptions and requirements stated in the FHA will be completed in accordance with the milestones in Section 13.4. **[END COM 9.5-004]**

Add the following after the fifth paragraph.

**STD SUP 9.5.1-2**

**[START COM 9.5-005]** An as-built review of final post-fire safe-shutdown analysis will be performed based on final plant cable routing and equipment arrangement. This review will include verification that purchased components required for post-fire safe-shutdown are not impacted by indirect effects of fire such as smoke migration from one fire area to another. **[END COM 9.5-005]** This activity will be completed in accordance with the milestones in Section 13.4.

### 9.5.1.15 Fire Protection Program

Replace the last sentence of the first paragraph with the following.

**STD COL 9.5.1-8-A**

The elements of the Fire Protection Program necessary to support receipt and storage of fuel onsite for buildings storing new fuel and adjacent fire areas that could affect the fuel storage area are fully operational prior to receipt for new fuel. Other required elements of the Fire Protection Program described in this section are fully operational prior to initial fuel loading per Section 13.4.

#### 9.5.1.15.1 Fire Protection Program Criteria

Add the following at the end of this section.

**EF3 SUP 9.5.1-1**

Table 9.5-201 supplements DCD Table 9.5-1.

#### 9.5.1.15.2 Organization and Responsibilities

Replace the last sentence of the thirteenth bullet of the section as follows.

**STD COL 9.5.1-9-A**

Control of changes to the fire protection program is defined in a license condition. Changes to the approved fire protection program may be made without prior approval of the NRC only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

| | |
|---|---|
| | 9.5.1.15.4 **Onsite Fire Operations Training** |
| | Replace the first paragraph with the following. |
| **EF3 COL 9.5.1-10-H** | **[START COM 9.5-006]** Implementation of the fire brigade will be in accordance with the milestone in Section 13.4 for the Fire Protection Program. **[END COM 9.5-006]** |
| | 9.5.1.15.9 **Quality Assurance** |
| | Replace the last sentence of this section with the following. |
| **STD COL 9.5.1-11-A** | The Quality Assurance Program implements the requirements of RG 1.189 through site-specific administrative controls procedures. **[START COM 9.5-007]** The procedures will be developed six months prior to fuel receipt and will be fully implemented prior to fuel receipt. **[END COM 9.5-007]** |
| | 9.5.1.16 **COL Information** |
| | 9.5.1-1-A **Secondary Firewater Storage Source** |
| **EF3 COL 9.5.1-1-A** | This COL item is addressed in Subsection 9.5.1.4. |
| | 9.5.1-2-A **Secondary Firewater Capacity** |
| **EF3 COL 9.5.1-2-A** | This COL item is addressed in Subsection 9.5.1.4. |
| | 9.5.1-4-A **Piping and Instrument Diagrams** |
| **EF3 COL 9.5.1-4-A** | This COL item is addressed in Subsection 9.5.1.2, 9.5.1.4, 9.5.1.5, and Figure 9.5-201. |
| | 9.5.1-5-A **Fire Barriers** |
| **STD COL 9.5.1-5-A** | This COL item is addressed in Subsection 9.5.1.10. |
| | 9.5.1-6-H **Smoke Control** |
| **STD COL 9.5.1-6-H** | This COL item is addressed in Subsection 9.5.1.11. |
| | 9.5.1-7-H **FHA Compliance Review** |
| **STD COL 9.5.1-7-H** | This COL item is addressed in Subsection 9.5.1.12. |

9.5.1-8-A **Fire Protection Program Description**

**STD COL 9.5.1-8-A** This COL item is addressed in Subsection 9.5.1.15.

9.5.1-9-A **Fire Protection Program License Changes**

**STD COL 9.5.1-9-A** This COL item is addressed in 9.5.1.15.2.

9.5.1-10-H **Fire Brigade**

**EF3 COL 9.5.1-10-H** This COL item is addressed in 9.5.1.15.4 and 13.1.2.1.5.

9.5.1-11-A **Quality Assurance**

**STD COL 9.5.1-11-A** This COL item is addressed in 9.5.1.15.9.

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**DCD Table 9.5-2**

**EF3-COL-9.5.1-1** Delete the "*" and "**" footnotes.

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9.5.2 **Communications System**

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

9.5.2.2 **System Design Description**

**Emergency Communication Systems**

---

Replace the last sentence of the first bullet with the following.

---

**EF3 COL 9.5.2.5-1-A** The Emergency Notification System (ENS) is a dedicated NRC FTS-2001 System that is normally used only for plant communication with the NRC. This system is independent from other site telephone systems. Electrical power for this phone system is provided by two redundant AC power sources. In addition, there are batteries, which would automatically supply power to these phones if a complete loss of AC power (to the phones) occurred. These batteries have an 8 hour capacity rating. This design ensures that the ENS located at the site is fully operable from the site in the event of a loss of offsite power at the site and is in compliance with the requirements of NRC Bulletin 80-15 for the ENS.

As a part of the overall Fermi 3 Emergency Plan, the ENS provides a means for initial notifications, as well as ongoing communications about plant systems, status and parameters, to the NRC. FTS-2001 telephones

for the ENS are located in the Control Room, Technical Support Center (TSC) and Emergency Operations Facility (EOF). The ENS phone lines connect via fiber optics to the local telephone company (Century Telephone Company) system. The ENS phones can also be used to communicate with offsite authorities if necessary (to make notifications if other systems fail, for example).

Fermi also has multi-line Radiological Emergency Response Preparedness (RERP) telephones (Marked Emergency Use Only) that have an ENS button to allow access to the ENS. This telephone system is normally fed from AC power; however, there are batteries which would automatically supply power to the telephones if a complete loss of AC power (to the telephones) occurred. These batteries have an 8 hour capacity rating.

If the ENS is inoperable, the required notifications can be made via commercial telephone or any other method to ensure that a report is made as soon as practical.

---

Replace the last bullet with the following.

---

**EF3 COL 9.5.2.5-2-A**

- Transmission System Operator Communications Link: Voice communications with the grid operator are provided via a Company-owned and -maintained transmission system that allows communications with the entire Corporate System. Access to this mode of transmission is made via the plant telephone system. A dedicated line is provided between the Control Room and the power system operator.

### 9.5.2.5 COL Information

#### 9.5.2.5-1-A Offsite Interfaces

**EF3 COL 9.5.2.5-1-A** This COL item is addressed in Subsection 9.5.2.2.

#### 9.5.2.5-2-A Grid Transmission Operator

**EF3 COL 9.5.2.5-2-A** This COL item is addressed in Subsection 9.5.2.2.

---

### 9.5.3 Lighting System

This section of the referenced DCD is incorporated by reference with no departures or supplements.

### 9.5.4 Diesel Generator Fuel Oil Storage and Transfer System

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

#### 9.5.4.2 System Description

**Detailed Design Description**

Replace the third to last sentence in the first paragraph with the following.

**STD COL 9.5.4-1-A**

**[START COM 9.5-008]** Procedures require that the quantity of DG fuel oil in the fuel oil storage tanks is monitored on a periodic basis. The diesel fuel oil usage is tracked against planned deliveries. Regular transport replenishes the fuel oil inventory during periods of high demand and ensures continued supply in the event of adverse weather conditions. These procedures ensure sufficient diesel fuel oil inventory is available on site so that the diesel can operate continually for seven days. **[END COM 9.5-008]** The procedures will be developed in accordance with the milestone and processes described in Section 13.5.

Replace the third paragraph with the following.

**EF3 COL 9.5.4-2-A**

The material for the underground piping portion of the fuel oil transfer system is carbon steel. A corrosion protection system is provided for internal and external surfaces of piping systems. The buried section of the piping is provided with waterproof protected coating and an impressed current type cathodic protection to control external corrosion.

#### 9.5.4.6 COL Unit-Specific Information

##### 9.5.4-1-A Fuel Oil Capacity

**STD COL 9.5.4-1-A**

This COL item is addressed in Subsection 9.5.4.2.

##### 9.5.4-2-A Protection of Underground Piping

**EF3 COL 9.5.4-2-A**

This COL item is addressed in Subsection 9.5.4.2.

### 9.5.5 Diesel Generator Combustion Air Intake and Exhaust System

This section of the referenced DCD is incorporated by reference with no departures or supplements.

### 9.5.6 Diesel Generator Starting Air System

This section of the referenced DCD is incorporated by reference with no departures or supplements.

### 9.5.7 Diesel Generator Lubrication System

This section of the referenced DCD is incorporated by reference with no departures or supplements.

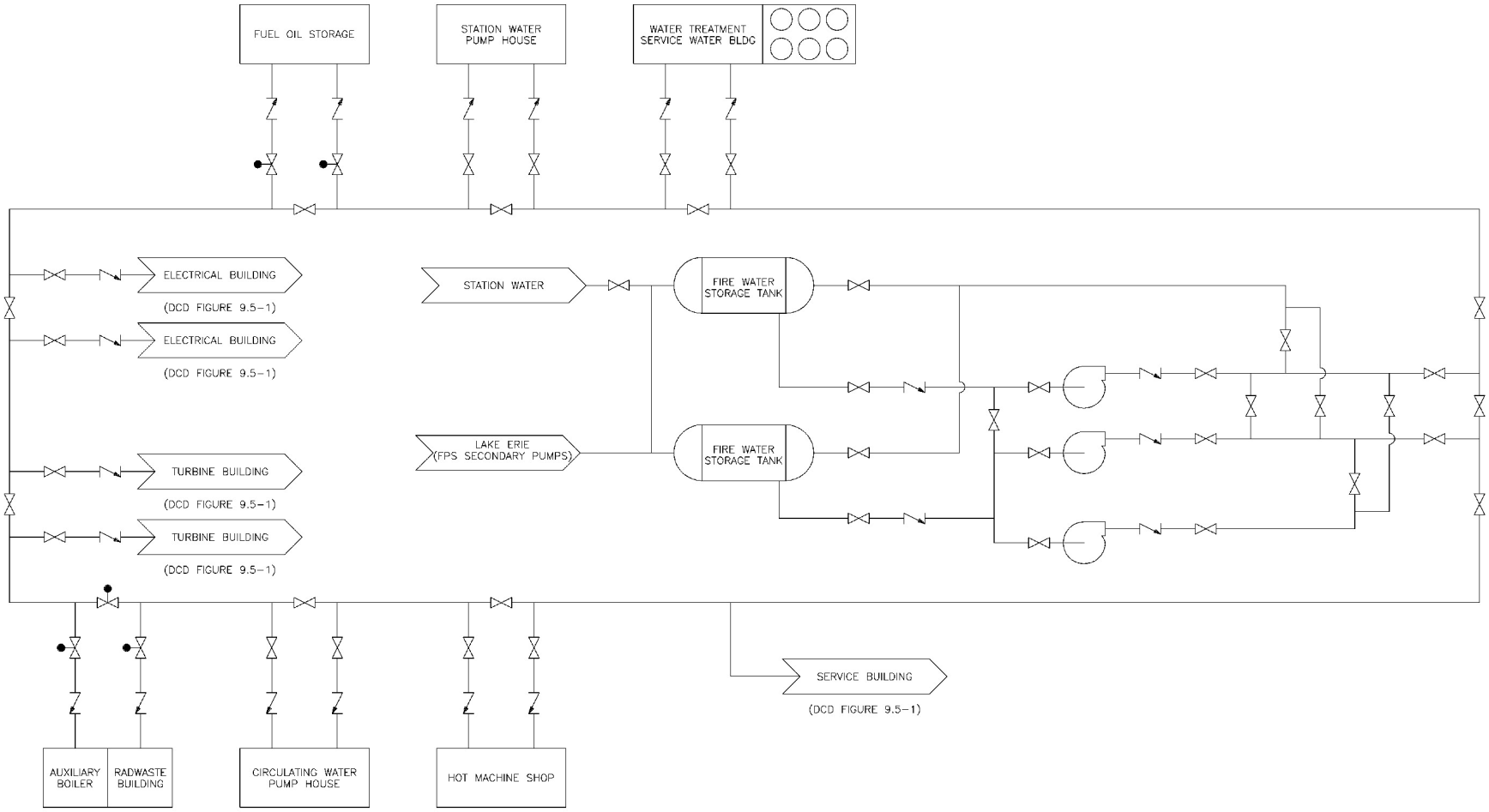
### 9.5.8 Diesel Generator Combustion Air Intake and Exhaust System

This section of the referenced DCD is incorporated by reference with no departures or supplements.

## Table 9.5-201 Codes and Standards [EF3 SUP9.5.1-1] [EF3 SUP 9A-01]

| | |
|---|---|
| **American Society of Mechanical Engineers (ASME)** | |
| Boiler and Pressure Vessel Code | Section IX, Qualification Standard for Welding and Brazing Procedures, Welder, Brazers and Welding and Brazing Operators |
| **Applicable Building Codes** | |
| Michigan Building Code | Michigan Building Code |
| **National Fire Protection Association (NFPA)** | |
| NFPA 25 | Recommended Practices for Inspection, Testing, and Maintenance of Standpipes and Hose Systems |
| NFPA 55 | Standard for Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks |
| **Environmental Protection Agency (EPA)** | |
| Environmental Protection Agency (EPA) | EPA Standards of Performance for Stationary Compression Ignition Internal Combustion Engines; Final Rule (40 CFR Parts 60, 85 et al.) |

## Figure 9.5-201 Fire Protection System Yard Main Loop



## Appendix 9A Fire Hazards Analysis

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

9A.2.1 **Codes and Standards**

Add the following second paragraph.

**EF3 SUP 9A-01**

The codes and standards that are applicable to the design of the site-specific portions of the yard are listed in Table 9.5-201. Table 1.9-202, Table 1.9-203 and Table 1.9-204 identify the relevant editions for each applicable code and standard. These codes and standards also apply to the operational aspects of the fire detection and suppression systems.

9A.4.7 **Yard**

Replace the first paragraph with the following.

**EF3 COL 9A.7-1-A**

The Yard includes all portions of the plant site external to the Reactor Building, Fuel Building, Control Building, Turbine Building, Radwaste Building, and Electrical Building. The fire zone drawings for the site-specific portions of the yard are provided in Figure 9A.2-33R and Figure 9A.2-201.

Replace the second sentence of the second paragraph with the following.

**EF3 COL 9A.7-2-A**

**[START COM 9A-001]** A detailed fire hazards analysis of the yard area that is outside the scope of the certified design can not be completed until cable routing is performed during final design. This information will be provided six months prior to fuel load. **[END COM 9A-001]**

9A.5.7 **Yard**

Replace the last two sentences with the following.

**EF3 COL 9A.7-2-A**

**[START COM 9A-001]** A detailed fire hazards analysis of the yard area that is outside the scope of the certified design can not be completed until

cable routing is performed during final design. This information will be provided six months prior to fuel load. **[END COM 9A-001]**

9A.5.8 **Service Building**

Replace the last two sentences with the following.

**EF3 COL 9A.7-2-A** **[START COM 9A-002]** A detailed fire hazards analysis of the yard area that is outside the scope of the certified design, which includes the Service Building, can not be completed until cable routing is performed during final design. This information will be provided six months prior to fuel load. **[END COM 9A-002]**

9A.5.9 **Service Water/Water Treatment Building**

Replace the last two sentences with the following.

**EF3 COL 9A.7-2-A** **[START COM 9A-003]** A detailed fire hazards analysis of the yard area that is outside the scope of the certified design, which includes the Service Water/Water Treatment Building, can not be completed until cable routing is performed during final design. This information will be provided six months prior to fuel load. **[END COM 9A-003]**

9A.7 **COL Information**

9A.7-1-A **Yard Fire Zone Drawings**

**EF3 COL 9A.7-1-A** This COL item is addressed in Subsection 9A.4.7.

9A.7-2-A **FHA for Site-Specific Areas**

**EF3 COL 9A.7-2-A** This COL item is addressed in Subsection 9A.4.7, Subsection 9A.5.7, Subsection 9A.5.8, and Subsection 9A.5.9.

**Table 9A.5-7 Revisions**

**EF3 COL 9A.7-2-A** Delete Fire Area F4202.

Add Fire Areas F8100 and F8101.

**Table 9A.5-7R Yard (Sheet 1 of 2)** [EF3 COL 9A.7-2-A]

| | | | |
|---|---|---|---|
| Fire Area: | F8100 | Description: | Hydrogen and Oxygen Storage Area |
| Building: | Yard | Applicable Codes: | IBC; Reg. Guide 1.189; NFPA 10,24, 50A, 72, 497, 804 |

Fire Zone Dwg: 9A.2-33R

| | |
|---|---|
| Building code occupancy classification: | U per IBC 312.1 |
| Electrical classification: | Class I Div 2 Group B |
| Safety-related divisional equipment or cables: | None |
| Non-safety-related redundant trains or equipment or cables: | None |
| Surrounded by fire barriers rated at: | None |
| Except: | none |

| Consisting of the following rooms: | | | Fire Detection | | Fire Suppression | |
|---|---|---|---|---|---|---|
| EL | Room# | Potential Combustibles | Primary | Backup | Primary | Backup |
| To be determined during detailed design. | Hydrogen and Oxygen Storage | 860 m3 hydrogen | H2 system instrumentation | Manual pull (outside hazard) | Hydrant | ABC fire extinguishers |

| | |
|---|---|
| >700 | Anticipated combustible load, $MJ/m^2$ |
| N/A | Non-sprinkled combustible load limit, $MJ/m^2$ |

Assuming all fire suppression systems inoperable, effect of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this fire area affects no safety-related or safe shutdown divisional equipment; all safety divisions and both redundant trains A and B are operable.

Assuming operation of fire suppression systems, effect of fire upon:

| | |
|---|---|
| Plant operation: | Turbine power reduction (due to loss of H2 makeup) |
| Radiological release: | None, no radiological materials present |
| Life safety: | N/A |
| Manual firefighting: | Access all around |
| Property loss: | Moderate |

**Table 9A.5-7R Yard (Sheet 2 of 2)** [EF3 COL 9A.7-2-A]

| | | | |
|---|---|---|---|
| Fire Area: | F8101 | Description: | Intake Area |
| Building: | Station Water Intake | Applicable Codes: | IBC; Reg Guide 1.189; NFPA 15, 45, 72, 804 |

Fire Zone Dwg: 9A.2-201

| | |
|---|---|
| Building code occupancy classification: | F-1 |
| Electrical classification: | N/A |
| Safety-related divisional equipment or cables: | N/A |
| Non-safety-related redundant trains or equipment or cables: | N/A |
| Surrounded by fire barriers rated at: | N/A |
| Except: | |

| Consisting of the following rooms: | | | Fire Detection | | Fire Suppression | |
|---|---|---|---|---|---|---|
| EL | Room# | Potential Combustibles | Primary | Backup | Primary | Backup |
| To be determined during detailed design. | To be determined during detailed design. | To be determined during detailed design. | Manual pulls (at EXITs) | None | Wet-pipe sprinkler (Sprinkler parameters to be determined during detailed design) | Fire extinguishers Yard hydrants |

| | |
|---|---|
| >700 | Anticipated combustible load, $MJ/m^2$ |
| 700 | Non-sprinkled combustible load limit, $MJ/m^2$ |

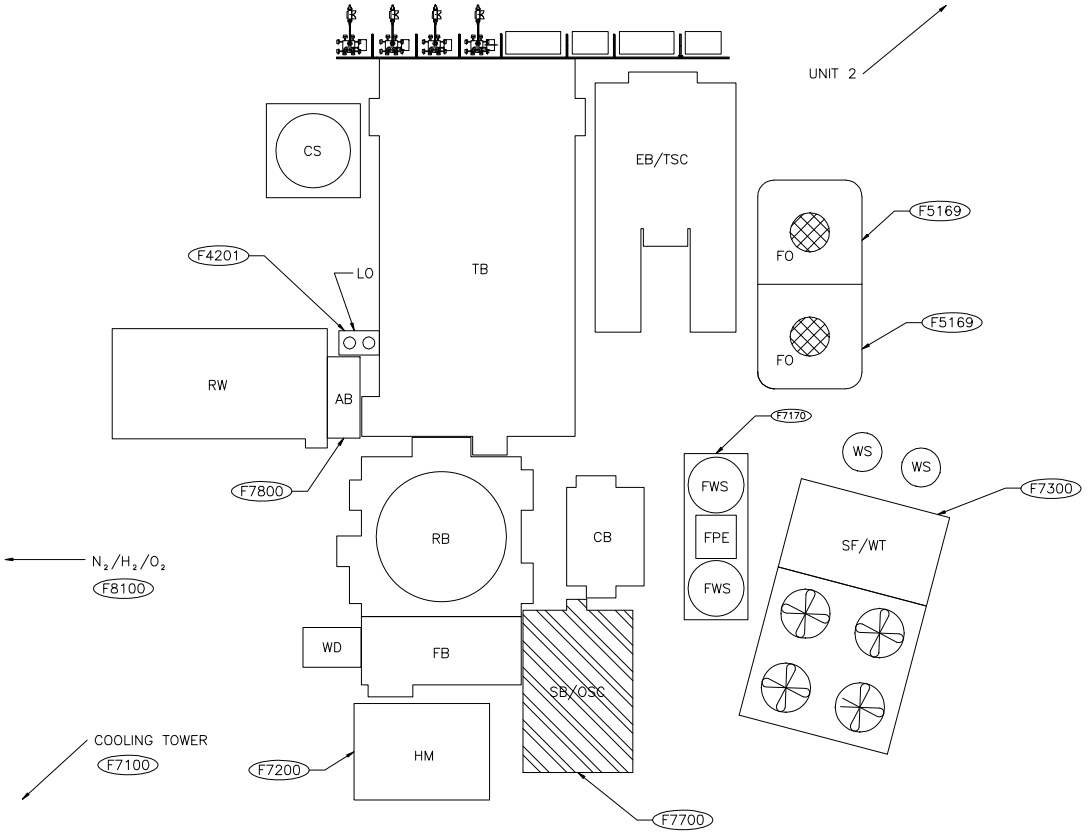
Assuming all fire suppression systems inoperable, effect of design basis fire on safe shutdown:

Complete burnout of all equipment and cables within this Fire Area affects no safety-related or safe shutdown divisional equipment; all safety divisions are operable.

Assuming operation of fire suppression systems, effect of fire upon:

| | |
|---|---|
| Plant operation: | To be determined during detailed design. |
| Radiological release: | None, no radiological materials present. |
| Life safety: | To be determined during detailed design. |
| Manual firefighting: | To be determined during detailed design. |
| Property loss: | To be determined during detailed design. |

## Figure 9A.2-33R Site Fire Protection Zone ESBWR Plot Plan

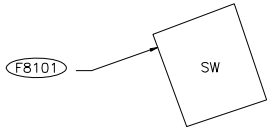



BUILDING LEGEND

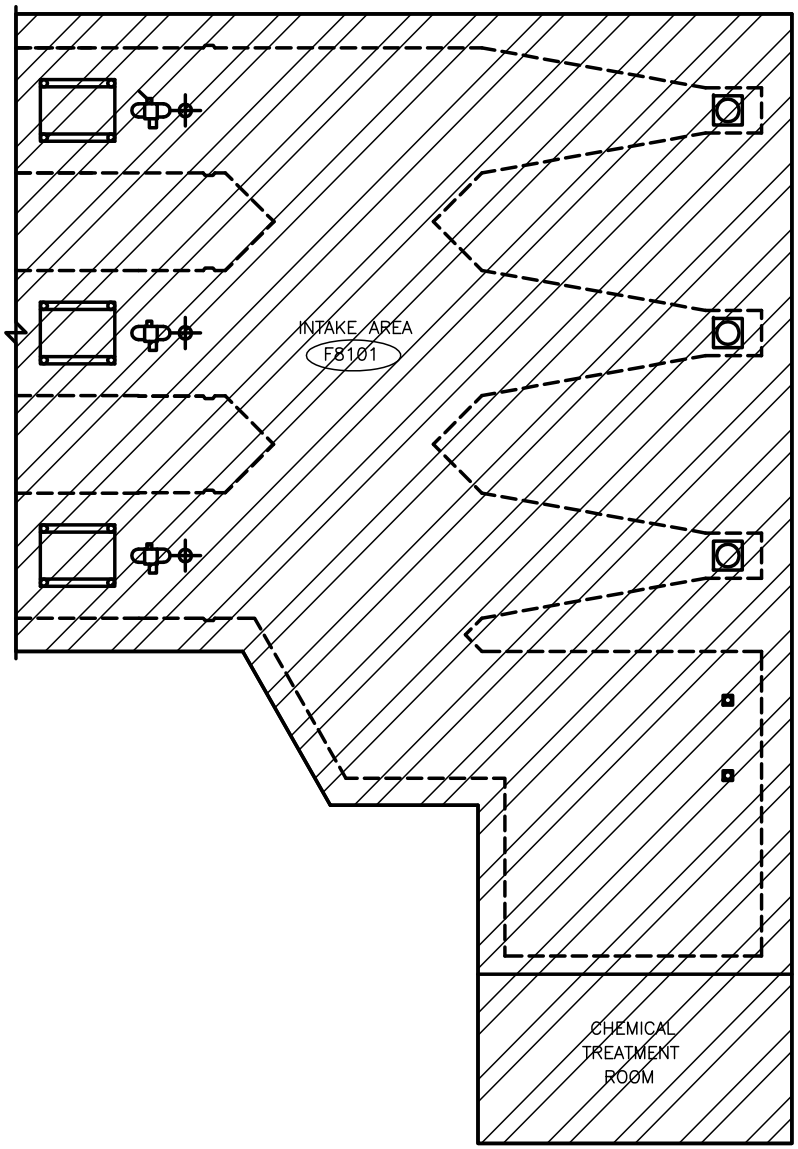
AB – AUXILIARY BOILER
CB – CONTROL BUILDING
CS – CONDENSATE STORAGE
EB – ELECTRIC BUILDING
FB – FUEL BUILDING
FO – DIESEL FUEL OIL STORAGE TANK
FPE – FIRE PUMP ENCLOSURE
FWS – FIRE WATER STORAGE TANK
HM – HOT MACHINE SHOP AND STORAGE
LO – LUBE OIL
OSC – OPERATION SUPPORT CENTER
RB – REACTOR BUILDING
RW – RADWASTE BUILDING
SB – SERVICE BUILDING
SF – SERVICE WATER BUILDING
SW – STATION WATER INTAKE BUILDING
TB – TURBINE BUILDING
TSC – TECHNICAL SUPPORT CENTER
WD – WASHDOWN BAYS (EQUIPMENT)
WS – WATER STORAGE

NOTES:

1. THE FOLLOWING ARE USED:
   - (FXXXX) FIRE AREA DESIGNATION
   - WET PIPE SPRINKLER COVERA
   - FOAM WATER DELUGE COVERA
2. ADMINISTRATION BUILDING AND TRAINING CENTER ARE PRE–EXISTING STRUCTURES.
3. FOR BUILDINGS WITHOUT FIRE AREA DESIGNATIONS, REFER TO TABLES.



## Figure 9A.2-201 Fire Zones - Station Water Intake Building




NOTES:

1. THE FOLLOWING ARE USED:

   FXXXX — FIRE AREA DESIGNATION

   WET PIPE SPRINKLER COVERAGE

   FOAM WATER DELUGE COVERAGE

2. ADMINISTRATION BUILDING AND TRAINING CENTER ARE PRE–EXISTING STRUCTURES.

3, FOR BUILDINGS WITHOUT FIRE AREA DESIGNATIONS, REFER TO TABLES.

## Appendix 9B Summary of Analysis Supporting Fire Protection Design Requirements

This section of the referenced DCD is incorporated by reference with no departures or supplements.