FINAL SAFETY ANALYSIS REPORT

CHAPTER 9

AUXILIARY SYSTEMS

9.0 AUXILIARY SYSTEMS

This chapter of the U.S. EPR Final Safety Analysis Report (FSAR) is incorporated by reference with supplements and departures as identified in the following sections.

9.1 FUEL STORAGE AND HANDLING

This section of the U.S. EPR FSAR is incorporated by reference with the following supplements.

9.1.1 Criticality Safety of New and Spent Fuel Storage and Handling

No departures or supplements.

9.1.2 New and Spent Fuel Storage

No departures or supplements.

9.1.3 Spent Fuel Pool Cooling and Purification System

No departures or supplements.

9.1.4 Fuel Handling System

No departures or supplements.

9.1.5 Overhead Heavy Load Handling System

No departures or supplements.

9.1.5.1 Design Basis

No departures or supplements.

9.1.5.2 System Description

9.1.5.2.1 General Description

No departures or supplements.

9.1.5.2.2 Reactor Building Polar Crane

No departures or supplements.

9.1.5.2.3 Fuel Building Auxiliary Crane

No departures or supplements.

9.1.5.2.4 Other Overhead Load Handling Systems

No departures or supplements.

9.1.5.2.5 System Operation

The U. S. EPR FSAR includes the following COL Item in Section 9.1.5.2.5:

> A COL applicant that references the U.S. EPR design certification will provide site-specific information on the heavy load handling program, including a commitment to procedures for heavy load lifts in the vicinity of irradiated fuel or safe shutdown equipment, and crane operator training and qualification.

This COL Item is addressed as follows:

Procedures

Administrative procedures to control heavy loads shall be developed 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 the following:

- Identification of any heavy loads and heavy load handling equipment outside the scope of loads described in the U.S. EPR FSAR and the associated heavy load attributes (load weight and typical load path).
- 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 handling 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 U.S. EPR FSAR Section 9.1.5 are inspected, tested, and maintained in accordance with ASME B30.2 (ASME, 2005). 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 U.S. EPR FSAR Section 9.1.5 meet the requirements of ASME B30.2 (ASME, 2005), 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.

9.1.5.3 Safety Evaluation

No departures or supplements.

9.1.5.4 Inspection and Testing Requirements

No departures or supplements.

9.1.5.5 Instrumentation Requirements

No departures or supplements.

9.1.5.6 References

{**ASME, 2005.** Overhead and Gantry Cranes – Top Running Bridge, Single or Multiple Girder, Top Running Trolley Hoist, ASME B30.2, American Society of Mechanical Engineers, 2005.}

9.2 WATER SYSTEMS

This section of the U.S. EPR FSAR is incorporated by reference with the following supplements.

9.2.1 Essential Service Water System

No departures or supplements.

9.2.1.1 Design Bases

{The temperatures in U.S. EPR FSAR Tables 9.2.5-3 and 9.2.5-4 envelope the temperature data for the Calvert Cliffs Site and are described below.

The CCNPP Unit 3 site-specific wet and dry bulb temperatures were determined using the guidance of Regulatory Guide 1.27 (NRC, 1976) and 30 years of climatology data (1976-2006) from Patuxent River Naval Air Station, just south of the site. The data analysis yielded a maximum calculated wet bulb temperature, when applying a 0% exceedance criterion, of 85° F (29° C) with a coincident dry bulb temperature of 99° F (37° C). This value is identified in Table 2.0-1 as a departure from the U.S. EPR site parameter envelope for the 0% exceedance noncoincident wet bulb temperature. This is justified because the cooling tower performance at its design point is analyzed for the worst case, time-dependent meteorological conditions noted below (including the highest recorded wet bulb temperature of 85°F (29°C)) and the similarly time-dependent DBA heat rejection curve.The 0% exceedance criterion means that the wet bulb temperature does not exceed the 0% exceedance value for more than two consecutive data occurrences, and the Patuxent River data was recorded hourly.

The Essential Service Water System (ESWS) cooling towers for CCNPP Unit 3 are designed in accordance with Regulatory Guide 1.27 guidance. The tower design point is based on a wet bulb temperature of 81° F (27° C) at a specific heat load yielding specific outlet water temperature. A 1°F increase was added for conservatism.The tower design point satisfies the supply water temperature requiremenr under limiting conditions as described below.

The wet bulb temperature is the controlling factor for establishing the tower basin water temperature because of the more limited ability of the ambient air to absorb heat energy in moving through the tower. Refer to Section 2.3.1.2.2.13 and the tabular comparison to U.S. EPR FSAR Table 9.2.5 -4 for the worst case 24 hour meteorological period for ESWS cooling. which envelopes the site-specific highest wet bulb temperature of 85° F. Alternatively, the higher difference between wet and coincident dry bulb temperatures indicates lower humidity and resultant higher evaporation rate, thus making this the controlling factor for determining both makeup water demand and required tower basin water volume. Refer to Section 2.3.1.2.2.13 and the tabular comparison to U.S. EPR FSAR Table 9.2.5-3 for the worst case 72 hour meteorological period for ESWS evaporation. In applying these factors to CCNPP Unit 3, the resulting maximum ESWS tower basin water temperature is less than the 95° F (35° C) worst-case design basis for the ESWS and the Component Cooling Water System (CCWS) heat exchangers. Based on the analysis of the Ultimate Heat Sink (UHS) System with local meteorological data, it has been determined that the maximum ESWS supply temperature is less than 95° F (35° C) and the maximum evaporative loss from a UHS cooling tower during the post-72 hour design basis accident condition is 225 gpm (852 lpm).}

9.2.1.2 System Description

No departures or supplements.

9.2.1.3 Component Description

9.2.1.3.1 Safety-Related Essential Service Water Pumps

No departures or supplements.

9.2.1.3.2 Dedicated Essential Service Water Pumps

No departures or supplements.

9.2.1.3.3 Debris Filters - Safety Divisions

No departures or supplements.

9.2.1.3.4 Debris Filter - Dedicated Division

No departures or supplements.

9.2.1.3.5 Piping, Valves, and Fittings

The U.S. EPR includes the following COL item in Section 9.2.1.3.5:

> A COL applicant that references the U.S. EPR design certification will provide a description of materials that will be used for the essential service water system (ESWS) at their site location, including the basis for determining that the materials being used are appropriate for the site location and for the fluid properties that apply.

This COL item is addressed as follows:

> {The ESWS piping, valves and fittings are made of carbon steel. This is compatible with the water chemistry in the UHS tower basin. Buried piping is coated and wrapped and provided with appropriate cathodic protection. The UHS cooling towers are constructed of reinforced concrete, tower fill is constructed of ceramic tile, spray piping and nozzles are fabricated of corrosion resistant materials (e.g., stainless steel, bronze), and the cooling tower basin is made of concrete. Appropriate chemical treatment as described in Section 9.2.5.2.4, is used to maintain the quality of water in the basin at an acceptable level to reduce corrosion, scaling etc, of ESWS components during normal operation.
>
> Post-DBA, there is no chemical treatment in the basin. However, the corrosive effects of Chesapeake Bay water on the ESWS piping and components have been evaluated and determined to have a negligible effect on the ability of the ESWS to perform its safety function for short term operation post-DBA.}

9.2.1.4 Operation

No departures or supplements.

9.2.1.5 Safety Evaluation

No departures or supplements.

9.2.1.6 Inspection and Testing Requirements

No departures or supplements.

9.2.1.7 Instrumentation Requirements

No departures or supplements.

9.2.1.8 References

{**NRC, 1976.** Ultimate Heat Sink for Nuclear Power Plants (for Comment), Regulatory Guide 1.27, Revision 2, U. S. Nuclear Regulatory Commission, January 1976.}

9.2.2 Component Cooling Water System

No departures or supplements.

9.2.3 Demineralized Water Distribution System

No departures or supplements.

9.2.4 Potable and Sanitary Water Systems (PSWS)

{The U.S. EPR FSAR describes the Potable and Sanitary Water System as a single system. While the function will remain the same, CCNPP Unit 3 classifies the system as two systems: the Potable Water System; and the Sanitary Waste Water System.

The Potable Water System delivers drinking quality water to various points throughout the plant, to individual components and for use as process water in other systems. Potable water is used for human consumption, sanitation and cleaning, and other domestic and process purposes inside the Nuclear Island (NI) and the Conventional Island (CI).

The Sanitary Waste Water System collects water discharged from water closets, urinals, showers, sinks and other sources of sanitary water and, with the exception of that from sources within the radiologically controlled area (RCA), directs it via the domestic waste water collection system through the sewage treatment plant for processing. The sanitary water from sources within the RCA is directed to the Liquid Radwaste System by the NI vents and drains system.

9.2.4.1 Design Basis

The Potable Water System supplies potable water for human consumption, cleaning and other domestic purposes, plus process water to other systems, during periods of normal operation, shutdown, maintenance and construction. The Potable Water System provides potable water at a flow rate sufficient to meet demand and keep potable water pressure above connected equipment's or systems' pressures. Potable water supplied to, and equipment provided for, emergency eyewash stations and emergency showers complies with the requirements of ANSI Z358.1, Emergency Eyewash and Shower Equipment (ANSI, 2004).

The Sanitary Waste Water System conveys sanitary wastes from their point of origin, and provides necessary treatment of the non-radiologically contaminated waste water, during periods of normal operation, shutdown, maintenance and construction. Where piping for the Sanitary Waste Water System is buried, provisions are made to assure adequate separation from Potable Water System piping. Where local conditions prevent this separation, controls on layout and installation provide similar assurance of protection of potable water from contamination.}

9.2.4.2 System Description

9.2.4.2.1 General Description

The U.S. EPR FSAR includes the following COL Item in Section 9.2.4.2.1:

> A COL applicant that references the U.S. EPR design certification will provide site-specific details related to the sources and treatment of makeup to the PSWS along with a simplified piping and instrumentation diagram.

This COL Item is addressed as follows:

{Potable Water System

The Potable Water System is shown schematically in Figure 9.2-1. It provides potable-grade water throughout the plant, for human consumption, cleaning and sanitation, and other domestic and selected process purposes. The Potable Water System supplies water that meets the requirements of local, state and federal codes and specifications regarding potability. The system is designed to satisfy peak anticipated demand for potable water, including hot water, during all phases of plant operation.

The Potable Water System consists of treatment of incoming water from the desalinization plant for potability, a potable water storage tank, pressure maintenance pumps, distribution piping and valves, water heaters, and electrical components and instrumentation for system monitoring, operation and control.

Clean water is supplied to the system from the desalinization plant, with the water passing through physical and/or chemical treatment to ensure its potability prior to its entry into the potable water storage tank (or the system if the storage tank is being bypassed). The potability treatment can be bypassed for maintenance, provided appropriate condition of the supply/ makeup water from the desalinization plant is confirmed.

Sanitary Waste Water System

The Sanitary Waste Water System is shown schematically in Figure 9.2-2.

Sanitary waste water or sanitary water is the term applied to the drainage from water closets, urinals, showers, bathroom/washroom sinks, kitchen and janitorial sinks, clothes washing and dish washing machines. Sanitary waste loading usually includes biological waste (including fecal matter), soaps, cooking grease and food scraps. However, at the CCNPP Unit 3, the sanitary waste stream is processed in two different ways depending on the source, due to differing contaminants.

The following locations within the NI have sanitary waste streams that have the potential to contain radioactive material. However, because these particular waste streams do not contain biological waste, cooking grease or food scraps, it is acceptable to collect them in the NI vents and drains system and direct them to the Liquid Waste Management System for processing as potentially radioactive waste:

- Personnel decon showers and decon sinks in the Access Building.
- Contaminated laundry facility in the Radioactive Waste Processing Building.

U.S. EPR FSAR Section 9.3.3 provides a discussion of the NI vents and drains system. The Liquid Waste Management System is discussed in U.S. EPR FSAR Section 11.2.

The following locations within the NI have sanitary waste water streams that are directed to the Waste Water Treatment Facility, because they have no connections to systems with the potential to carry radioactive materials:

- Water closets, urinals, hand wash sinks and personnel showers in the following areas:
    - Non-radiologically controlled area (non-RCA) in the Access Building.
    - Non-RCA in the Safeguards Buildings.
- Sink and dishwasher in the kitchen in Safeguards Building 2.
- Hand wash sinks in the Emergency Power Generating Buildings 1 through 4.

The waste stream from each of these locations/components is collected by the Sanitary Waste Water System and flows to collection pits or tanks, from which it drains by gravity to the Waste Water Treatment Facility.

The Waste Water Treatment Facility takes sanitary waste water and puts it through a process of mechanical, biological and chemical processing to prepare it for discharge and disposal. The primary driver of the process is aerobic microbes that digest the sewage. Filtration and dewatering of solid material and separation of emulsified oil is followed by disinfection. The liquid effluent is then discharged through the seal well and discharge structure to the Chesapeake Bay. Dewatered sludge (solids) is transported offsite for disposal at a municipal landfill.

9.2.4.2.2 Component Description

Potable Water System

Desalinization Plant

Clean water is supplied to the Potable Water System from the desalinization plant.

Potable Water Storage Tank

The potable water storage tank has a usable volume sufficient to accommodate demand surges during peak periods of potable water usage. It is equipped with isolable inlet and outlet lines, an overflow line and a vent, as well as instrumentation for level control, indication and alarm functions. A bypass line is provided so that supply water can bypass the storage tank during periods of tank maintenance. The tank is constructed of material compatible with drinking-quality water.

Potable Water Transfer *Pumps*

Two 100% capacity pumps are provided to maintain system pressure within the prescribed operating range. These pumps are made of materials compatible with drinking-quality water. Each pump is equipped with a discharge check valve and suction and discharge isolation valves.

Piping and Valves

Branch connections to equipment, including hose bibs, or to other systems are individually isolable and are equipped with backflow preventers to prevent backflow and potential contamination of the Potable Water System. Connections to sinks or showers do not require backflow preventers, because there is an air gap between the potable water and the receiving drains. However, siphon breakers are installed where needed.

Recirculation lines are included as a protective measure for the potable water transfer pumps to provide a recirculation path back to the potable water storage tank during periods when the operating pump must run continuously, but at a reduced flowrate demand. The automatic recirculation valve, located in each recirculation line, throttles open, as required, to allow water to flow back to the potable water storage tank.

Water Heaters

Water heaters are provided for showers, wash and janitorial sinks, lunchroom, kitchen, laundry, and eyewash stations, and are sized, installed and controlled in such fashion as to supply on-demand hot water. Eyewash stations and emergency showers also include pre-set temperature control valves to deliver tepid water, per OSHA requirements.

Sanitary Waste Water System

Piping and Valves

Sanitary waste water piping is sized for peak anticipated loading during outage periods and as required to meet national and local plumbing code requirements.

Collection Pits and Tanks

Sanitary waste collection pits are concrete lined with steel. Tanks are constructed of steel.

Waste Water Treatment Facility

The Waste Water Treatment Facility is a separate building for the treatment of sanitary waste. It includes tanks for collection, pre-treatment, and sludge for holding purposes, macerating pumps, oil/water separator, aeration blowers, and clarifiers.

9.2.4.2.3 Operations

No departures or supplements.

9.2.4.3 Safety Evaluation

Potable Water System

The Potable Water System is not a safety-related system. Therefore, it does not require a safety evaluation with respect to plant design basis events.

With respect to compliance with Criterion 60 of Appendix A to 10 CFR 50, the Potable Water System is not connected to any components or other systems that have the potential to carry radiological material, nor do any systems discharge to it with the exception of the desalination plant that supplies makeup. Further, under normal operating conditions, system pressure is maintained above the pressure of supplied components or systems, thus preventing backflow from that supplied component / system.

In addition, a backflow preventer and isolation valve are provided at "hard" connections to supplied components or systems, including hose bibs. These devices are on the potable water side of the connection to prevent backflow under abnormal, reversed differential pressure conditions.

Where potable water is delivered to buildings, there is no path for water from the supplied buildings to be recirculated back to upstream components (i.e., potable water storage tank, transfer pumps or recirculation lines).

At sinks or showers, an air gap between the potable water supply and the receiving drain prevents possible contamination from backflow. There are also siphon breakers where necessary on supply risers.

With respect to flooding concerns, the potable water storage tank is located such that even its catastrophic failure would not threaten the functionality of safety-related SSCs. Intervening topography and site drainage configuration would direct released water away from areas where it might otherwise cause damage. Site flooding is discussed in Section 2.4.10.

Sanitary Waste Water System

The Sanitary Waste Water System provides no safety-related function. Therefore, it does not require a safety evaluation with respect to design basis events.

Sanitary waste water from decon showers, decon sinks and the laundry in the Access Building is directed to the Liquid Waste Management System, through the NI vents and drains system. Although drainage from showers, sinks and laundry is typically classified as sanitary water, the decon showers and sinks are used exclusively for radiological decontamination of personnel, and the laundry is used for personnel anti-contamination clothing and equipment (e.g., respirators). This does not result in biological waste loading, and is acceptable for forwarding to the Liquid Waste Management System.

With respect to compliance with Criterion 60 of Appendix A to 10 CFR 50 (CFR, 2008), sanitary waste piping in the Access Building leads from the non-RCA through the portion of the Sanitary Waste Water System that collects domestic waste water. This sanitary waste piping is completely separate from the NI vents and drains system. Further, the portion of the Sanitary Waste Water System that collects domestic waste water in the Access Building, the Safeguards Buildings, and outside (underground) areas in the NI is not connected to any other system, so there is no potential for inadvertent introduction of radioactive material. The remainder of the Sanitary Waste Water System is outside the NI portion of the plant, and does not connect to any system or equipment that has the potential to carry/contain radiological contamination.

With respect to flood protection:

- The sanitary waste water collection pits or tanks are located at or below grade and in areas that are separated from safety-related SSCs. The drain lines from these pits or tanks are embedded in floor slabs and run underground outside the buildings. Inside the buildings, flooding from pits, tanks or broken sanitary lines will be effectively controlled by building floor drain systems that are designed to handle larger flows from, for example, the Fire Protection System (refer to U.S. EPR FSAR Section 9.3.3 for discussion of floor drains). Therefore, failures of the Sanitary Waste Water System, including failures of pits or tanks, will not jeopardize safety functions by flooding.

- The Waste Water Treatment Facility is physically separated and located down-grade from safety-related SSCs, in a separate building. In addition, buildings that house safety-related SSCs are constructed with ground floor slabs elevated above grade and with surrounding site drainage established to direct potential flood waters away, as described in Section 2.4.10. Therefore, failures of the Waste Water Treatment Facility, including failures of tanks, will not jeopardize safety functions by flooding.

9.2.4.4 Inspection and Testing Requirements

Potable Water System

Once the system is placed in service, periodic routine sampling of the water provides ongoing verification of potability.

Sanitary Waste Water System

The Sanitary Waste Water System, including the Waste Water Treatment Facility, is visually inspected to verify installation in accordance with design drawings and documents, and functionally tested to demonstrate proper system operation.

9.2.4.5 Instrumentation Requirements

Instrumentation includes level, temperature, pressure and flow as required for process automation, and for the visual and audible indication and alarms necessary for monitoring of system performance.

9.2.4.6 References

This section is added as a supplement to the U. S. EPR FSAR.

ANSI, 2004. Emergency Eyewash and Shower Equipment, ANSI Z358.1, American National Standards Institute, 2004.

CFR, 2008. Control of Releases of Radioactive Materials to the Environment, Title 10, Code of Federal Regulations, Part 50, Appendix A, General Design Criterion 60, U. S. Nuclear Regulatory Commission, 2008.}

9.2.5 Ultimate Heat Sink

No departures or supplements.

9.2.5.1 Design Basis

A COL Applicant that references the U.S. EPR FSAR design certification will provide site specific design information corresponding to U.S. EPR FSAR Figure 9.2.5-2 [[Conceptual Site Specific UHS Systems]].

The conceptual design information is addressed as follows:

{ESWS support systems are schematically represented in Figure 9.2-3. Normal essential service water makeup provides up to 629 gpm (2,381 lpm) of desalinated water to replenish ESWS inventory losses due to evaporation, blowdown, drift, and incidental system leakage during normal operations and shutdown/cooldown. ESWS cooling tower blowdown discharges up to 61 gpm (231 lpm) of water to the retention basin to maintain ESWS chemistry. This quantity is based on maintaining ten cycles of concentration in the cooling tower basin.

During the post-72 hour design basis accident condition, the ESWS Cooling Tower for one train has a maximum evaporative loss of 225 gpm (852 lpm), and blowdown is secured.

The ESWS makeup chemical treatment system provides a means for adding chemicals to the UHS makeup water and to the normal ESWS makeup water. This is done to limit corrosion, scaling, and biological contaminants in order to minimize component fouling.}

9.2.5.2 System Description

The U. S. EPR FSAR includes the following COL Items in Section 9.2.5.2:

> A COL applicant that references the U.S. EPR design certification will provide site-specific information for the UHS support systems such as makeup water, blowdown and chemical treatment (to control biofouling).

> A COL applicant that references the U.S. EPR design certification will provide a description of materials that will be used for the UHS at their site location, including the basis for determining that the materials being used are appropriate for the site location and for the fluid properties that apply.

The COL Items are addressed as follows:

{Sections 9.2.5.2.1 through 9.2.5.2.4 are added as a supplement to the U. S. EPR FSAR.

9.2.5.2.1 Normal ESWS Makeup

Normal ESWS makeup water is provided to the ESWS cooling tower basins using desalinated water from the desalinization plant. FSAR Section 9.2.9 provides additional discussion of the Raw Water Supply System and the desalinization plant.

Normal ESWS makeup water is delivered from the desalinization plant to the power block area. A separate line feeds each ESWS division. Each ESWS division's normal makeup line ties into its ESWS emergency makeup line (i.e., UHS makeup water line) through a safety-related motor operated valve (MOV) in the ESWS pumphouse at the ESWS cooling tower basin. The tie-in point is inboard of (or downstream of) the UHS makeup water system isolation MOV. The safety-related normal makeup water isolation MOV ensures the integrity of the ESWS cooling tower basin and the UHS Makeup Water System by closing in the event of a design basis accident (DBA).

9.2.5.2.2 Blowdown

Blowdown from the ESWS cooling tower basins is a nonsafety-related function. The site-specific blowdown arrangement for each ESWS cooling tower basin is a line that runs from the ESWS pump's discharge piping to a header in the yard area where all four blowdown lines join. The header then runs to the waste water retention basin.

The connection at the ESWS pump discharge is made through a safety-related MOV that closes automatically in the event of a DBA to ensure ESWS integrity.

An alternate blowdown path is provided from the same pump discharge connection through a second safety-related MOV in case the normal path is unavailable.

Under normal operating conditions and shutdown/cooldown conditions, the normal blowdown valves automatically modulate blowdown flow from their ESWS trains to the retention basin to help ensure cooling water chemistry remains within established limits.

During a DBA, blowdown flow can be manually controlled from the main control room by adjustment of the safety-related MOV.

9.2.5.2.3 UHS Makeup Water System

Emergency makeup water for the ESWS is provided by the site-specific, safety-related UHS Makeup Water System that draws water from the Chesapeake Bay. The common forebay is shared between the CWS makeup water system and UHS makeup water system. Two buried 60" safety-related pipes provide a flow path for Chesapeake Bay water to enter the common forebay. Both pipes are designed to account for head losses in the pipe and provide sufficient flow for the CWS makeup and UHS makeup. Both pipes are normally in operation, however, either pipe can be isolated for maintenance as the other pipe is capable of providing 100% flow for CWS makeup and UHS makeup. Due to the head loss through the pipes, the design low water level at the common forebay for the UHS makeup intake is at EL. -8 ft NGVD29, which is 2 feet lower than the design low water level in the Chesapeake Bay of -6 ft NGVD29. The common forebay invert elevation is at -22.5 ft NGVD29, which provides ample additional margin in pump submergence during UHS operation with one or two intake pipes. The UHS Makeup Water Intake Structure houses four bar screens and four dual-flow traveling screens that remove large debris and trash that may be entrained in the flow. Each traveling screen is located in a separate enclosure and provides the required flow to the associated UHS Makeup Water Pump. Each traveling screen is equipped with a screen wash system which provides a high pressure spray to remove debris from the traveling screens.

There are four independent UHS Makeup Water System trains, one for each ESWS division. Each train has one vertical turbine type wet pit pump, a discharge check valve, a self-cleaning strainer, and a pump discharge isolation MOV (all housed in four separate rooms at the UHS Makeup Water Intake Structure), plus the buried piping running up to and into the ESWS pumphouse at the ESWS cooling tower basin. The UHS Makeup Water System isolation MOV is located inside the ESWS pumphouse at the connection to the ESWS cooling tower basin.

In addition, each train has a surveillance test bypass that runs from just upstream of the isolation MOV at the ESWS cooling tower basin, through a safety-related MOV, to the blowdown line upstream of the blowdown flow meter. The latter safety-related MOV is normally closed, and will go closed if open on receipt of an accident signal, providing assurance of UHS Makeup Water System integrity.

Instrumentation and controls are provided for monitoring and controlling individual components and system functions. Switchgear and electrical equipment supplying power to each train's pump and MOVs are located in its associated pump room.

A general area drawing of the site-specific CCNPP Unit 3 UHS Makeup Water Intake and Circulating Water Makeup Water Intake Structures is shown in Figure 9.2-4. Plan views of the UHS Makeup Water Intake Structure are shown in Figure 9.2-5 and Figure 9.2-6. A section view is shown in Figure 9.2-8. The UHS Makeup Water System is shown in Figure 9.2-9.

9.2.5.2.4 ESWS Makeup Water Chemical Treatment

The UHS Makeup Water System is normally in standby mode, and its brackish water is therefore stagnant. Specific chemistry requirements are defined to minimize corrosion, prevent scale formation, and limit biological and sedimentary fouling that could inhibit UHS Makeup Water flow. In addition, there are chemical additives used in the ESWS cooling towers to reduce scaling and corrosion, and to treat potential biological contaminants, which are added via the normal ESWS piping. The ESW makeup chemical treatment system provides the chemistry control in both instances.

The treatment system consists of multiple skid-mounted arrangements, one for each division's ESWS cooling tower and at least one for the UHS Makeup Water Intake Structure to service each UHS Makeup Water System division's train. Each skid contains the equipment, instrumentation and controls to fulfill the system's function of both monitoring and adjusting water chemistry. The root valves at the connections of chemical addition and sample lines to the UHS Makeup Water System or normal ESWS piping are safety-related as necessary to ensure the integrity of UHS Makeup Water System piping during and following a DBA.

The specific chemicals and addition rates are determined by periodic water chemistry analyses. The chemicals are divided into six categories, based on function:

- biocide - prevents buildup of potentially damaging aquatic life, such as zebra mussels, and controls bacterial growth in the ESWS cooling towers (particularly Legionellae).
- algaecide - prevents buildup of potentially damaging algae and plant growth.
- pH adjuster - counteracts the acidic effects of the algaecide.
- corrosion inhibitor - prevents corrosion of piping and components due to saltwater environment and exposure.
- scale inhibitor - prevents buildup of scale and mineral deposits that could inhibit process flow.
- silt dispersant - prevents buildup of hard silt deposits.

Additions to the ESWS cooling towers are made as necessary on a periodic or continuing basis. The additions to the UHS Makeup Water System are made coincident with surveillance test runs, or as otherwise needed.

9.2.5.3 Component Description

9.2.5.3.1 Mechanical Draft Cooling Towers

This section of the U.S. EPR FSAR is incorporated by reference with the following supplemental information.

Section 9.2.5.3.1 of the U.S. EPR FSAR discusses the need to account for sitespecific conditions in determining an appropriate wet bulb correlation factor to account for potential interference and recirculation effects. Per the U.S. EPR FSAR, this is addressed as a part of COL Item 2.0-1 . CCNPP Unit 3 utilizes Table 2.0-1 in order to respond to COL Item 2.0-1. Table 2.0-1 refers to FSAR Section 9.2.1 with respect to the acceptability of site-specific temperature characteristics for the U.S. EPR FSAR, UHS Design.

9.2.5.3.2 Piping, Valves, and Fittings

No departures or supplements.

The following sections are added as a supplement to the U.S. EPR FSAR.

Normal ESW Makeup Isolation Valves

The normal ESWS Makeup Water System isolation valves are safety-related MOVs designed to ASME Section III, Class 3 requirements, and made of materials compatible with the brackish UHS makeup water.

UHS Makeup Water Intake Structure Bar Screens and Traveling Screens

The UHS Makeup Water Intake Structure has four bar screens and four dual-flow traveling screens. The screens prevent debris from passing into the UHS Makeup Water System. The traveling screens are equipped with a Seismic Category II screen wash system that includes four screen wash pumps. The screen wash pumps provide a high pressure spray to remove debris from the traveling screens. These traveling screens are classified as NS-AQ and are designed to remain mechanically functional following an SSE. The ability to manually rotate and clean the travelling screens to ensure adequate flow to the UHS makeup water pumps following a DBA is also provided. The structure housing the traveling screens will protect them from other natural phenomena, e.g. hurricane, tornado. The structure also provides separation between the screens for each of the four divisions. During normal operation, the traveling screens are powered from the Normal Power Supply System. Backup (Class IE) power supply is provided to operate the traveling screens post-DBA through the Emergency Power Supply System, for convenience, if the electrical components of the traveling screens are functional post DBA.

UHS Makeup Water System Pumps

There are four vertical turbine pumps, each rated at 750 gpm (approximately 2835 lpm). Each pump is driven by an electric motor, and is equipped with a discharge check valve and motor operated isolation valve. They are designed to ASME Section III, Class 3 requirements, and constructed of materials compatible with the brackish UHS makeup water.

UHS Makeup Water System Isolation Valves

The UHS Makeup Water System isolation valves are safety-related MOVs designed to ASME Section III, Class 3 requirements, and are made of materials compatible with the brackish UHS makeup water. For each train, there are UHS Makeup Water System Pump isolation, minimum flow, and initial fill isolation MOVs, the UHS Makeup Water System isolation MOV at the ESWS cooling tower basin, and the UHS Makeup Water System bypass isolation MOV.

UHS Makeup Water System Self Cleaning Strainers

There are four UHS Makeup Water System self-cleaning strainers, one on the discharge side of each UHS Makeup Water pump. They are designed to ASME Section III, Class 3 requirements, and constructed of materials compatible with the brackish UHS makeup water.

The strainers remove debris from the process flow that is not trapped by the bar screens and traveling screens.

UHS Makeup Water System Piping

The UHS Makeup Water System piping and fittings that perform safety functions are designed to ASME Section III, Class 3 requirements, including normal operation and anticipated transient conditions. They are constructed of materials compatible with the brackish UHS makeup water.

Chemical Treatment System Components

The components of the chemical treatment system upstream of the safety-related ESW normal makeup MOV are nonsafety-related. They include:

Metering pumps - These are positive displacement pumps capable of delivering adjustable, measured amounts of chemical product.

Tanks - These storage tanks are provided for each category of chemical.

Control Valves - These are needle valves that can be adjusted for precise control of the rate of chemical addition.

Sample Valves/Lines - There are several sample points located at representative points in the normal and emergency makeup piping for confirmatory sampling of makeup water chemistry.

pH Monitor - This device monitors makeup water pH.

Conductivity meter - This device measures makeup water conductivity.

All of these components are constructed of materials compatible with the chemicals utilized in the treatment system.

ESWS Cooling Tower Blowdown System Isolation Valves

These are safety-related MOVs that isolate blowdown at the branch connection on the ESWS pump discharge, for assurance of ESWS integrity in the event of an accident. The valves and the branch connections up to the valves are designed to ASME Section III, Class 3 requirements, and constructed of materials compatible with the brackish UHS makeup water.

ESWS Cooling Tower Blowdown System Piping, Valves and Fittings

The ESWS Cooling Tower Blowdown System components downstream of the MOV are non-safety-related. They are made of carbon steel material because the normal blowdown is non-brackish water from the normal ESWS makeup system.

Screen Wash System Components

The screen wash system consists of one screen wash pump, associated piping, valves and instruments for each train. The screen wash system components are classified as NS-AQ, and are designed as Seismic Category II. All of these components are constructed of materials compatible with the brackish UHS makeup water.

9.2.5.4 System Operation

9.2.5.4.1 Normal Operating Conditions

The normal ESWS makeup is supplied from the desalinization plant. The two operating ESWS divisions have the normal makeup MOVs open, while the two standby divisions' normal makeup MOVs are closed.

Blowdown from each train is aligned to the waste water retention basin, with flow rate controlled by manual adjustment of the safety-related motor operated blowdown isolation valve.

The UHS Makeup Water System for each division is in standby, with the UHS Makeup Water System isolation MOV at the ESWS cooling tower basin closed and the pump isolation MOV closed. The bypass line's MOV is also closed.

Periodic surveillance testing is conducted to demonstrate UHS Makeup Water System operability, and includes addition of chemicals as necessary to maintain its water chemistry within the prescribed limits.

9.2.5.4.2 Abnormal Operating Conditions

On receipt of an accident signal, the normal ESWS Makeup Water System isolation MOVs that are open will close; those that are closed will remain closed. In addition, the ESWS cooling tower blowdown isolation valves will close, and any open safety-related valves in the chemical treatment system will close. None of these safety-related valves can be opened until the accident signal is cleared. Subsequent action is manually initiated from the main control room or locally, based on operators' judgment resulting from prevailing conditions and indications. This includes initiating the UHS Makeup Water System to any and/or all ESWS cooling tower basins, as well as blowdown from any and/or all ESWS cooling tower basins, as well as manual rotation and cleaning of traveling screens if required.

9.2.5.5 Safety Evaluation

This section of the U.S. EPR FSAR is incorporated by reference with the following supplemental information.

Section 9.2.5.5 of the U.S. EPR FSAR discusses the need to verify that the makeup water supply is sufficient for the site-specific ambient conditions. Per the U.S. EPR FSAR, this is addressed as a part of COL Item 2.0-1. CCNPP Unit 3 utilizes Table 2.0-1 in order to respond to COL Item 2.0-1. Table 2.0-1 refers to FSAR Section 9.2.1 with respect to the acceptability of site-specific temperature characteristics for the U.S. EPR FSAR, UHS Design.

Normal ESWS makeup is a non-safety-related function, and thus requires no safety evaluation with respect to design basis events. Similarly, both cooling tower blowdown and chemical treatment are non-safety-related functions and require no safety evaluation. However, the connections to safety-related piping through which these functions are made and the accompanying isolation valves are safety-related, which ensures the integrity of the safety-related piping in the event of a DBA.

The UHS Makeup Water System function is to provide reliable makeup to the ESWS cooling tower basins, starting no later than 72 hours after receipt of an accident signal, to ensure that sufficient makeup flow is provided so the ESWS can fulfill its design requirement of shutdown decay heat removal for a minimum of 30 days following a DBA.

This function is assured because the UHS Makeup Water System:

- ♦ Is designed, procured, constructed and operated in accordance with the criteria for ASME Section III, Class 3 safety-related systems, structures and components, and Seismic Category 1 requirements, including the tie-in piping and isolation valves for normal makeup, and chemical addition and sampling.

- Has four equivalent and completely independent trains, any two of which are capable of providing the required worst case makeup flow.
- Has components, including the UHS Makeup Water System pump and its associated valves, strainer, electrical switchgear, and local controls and instrumentation that are protected against the effects of external and internal flooding as described in Section 3.4.3.10.
- Has an UHS Makeup Water Intake Structure which is designed and built for protection against seismic and missile hazards.
- Has each UHS Makeup Water System pump installed such that its function is protected against the worst case low water event.
- Has seismically qualified and installed (buried) piping runs from the UHS Makeup Water Intake Structure to the individual ESWS cooling tower basins.
- Is treated to meet specified limits on system water chemistry in order to prevent potentially detrimental fouling of stagnant piping sections and surfaces.
- Is periodically performance tested and sampled to confirm operability and verify system water chemistry requirements.
- Has a set of traveling screens that remain mechanically functional following an SSE. The ability to manually rotate and clean the traveling screens to ensure adequate flow to the UHS makeup water pumps following a DBA is also provided.

In addition, reconciliation of the site-specific climatology data has demonstrated that the ESWS cooling tower performance maintains the ESWS temperature below the required 95° F (35° C).

9.2.5.6 Inspection and Testing Requirements

The UHS Makeup Water System components, including the safety-related motor operated isolation valves for makeup and blowdown, and the safety-related isolation valves for chemical treatment and sampling, are procured and fabricated in accordance with the quality requirements for safety-related ASME Section III, Class 3 systems, structures and components to ensure compliance with approved specifications and design documents.

Installation of individual components and overall system construction are inspected to verify the as-built condition is in accordance with approved drawings. Performance testing upon completion of construction verifies the system's ability to perform its design safety function.

Finally, periodic surveillance testing of the system, including the safety-related isolation valves, provides continuing assurance of the system's ongoing capability to perform its design function. Surveillance testing includes system performance tests and inspection of individual components, as appropriate to their importance to system function and their tendency to degrade due to their operational conditions and environment.

9.2.5.7 Instrumentation Applications

Instrumentation is applied to the ESWS Normal Makeup Water System, UHS Makeup Water System and blowdown, to the extent necessary to monitor essential component conditions and verify real time system performance. This includes limit switches that provide remote position indication for valves. It also includes pressure, temperature and differential pressure sensors that provide local and remote display of system pressure, temperature and flow. In addition, temperature and amperage sensors can be used for indirect flow indication and direct indication of component status.

System performance can also be assessed using level indication on the cooling tower basins.}

9.2.5.8 References

No departures or supplements.}

9.2.6 Condensate Storage Facilities

No departures or supplements.

9.2.7 Seal Water Supply System

No departures or supplements.

9.2.8 Safety Chilled Water System

No departures or supplements.

9.2.9 Raw Water Supply System

The U. S. EPR FSAR includes the following conceptual information and COL Item in Section 9.2.9:

> [[The RWSS contains water received from a site-specific natural source and supplies it directly to the points of use where it may be further processed by the receiving plant systems. The raw water for demineralized water, potable water, fire protection, and ultimate heat sink (UHS) normal makeup is preprocessed as required by filtration, reverse osmosis, chemical treatment, and desalinization of brackish raw water sources prior to use.]] The conceptual design of the RWSS is shown in Figure 9.2.9 -1—[[Conceptual Site-Specific Raw Water Supply System]].
>
> [[The RWSS does not provide any safety-related function. There is no connection between raw water and the components of other systems that have the potential to contain radiological contamination.]]
>
> [[Normal nonsafety-related makeup water is provided to the UHS cooling tower basins as clean (desalinated) water. Connections to the UHS cooling tower basins are made at safety-related motor operated valves (MOV), identified in Section 9.2.5. These valves close during a DBA on receipt of an accident signal, thereby maintaining UHS cooling tower basin integrity under accident conditions.]]
>
> The RWSS and the design requirements of the RWSS are site-specific and will be addressed by the COL applicant.

The conceptual information and COL Item are addressed as follows:

{Raw water is the term usually applied to untreated water. At CCNPP Unit 3, raw water is supplied from the Circulating Water System Makeup Water System (which draws water from the Chesapeake Bay) and is directed to the desalinization plant. The desalinization plant processes raw brackish water through filtration and reverse osmosis, with auxiliary chemical treatment, delivering clean water to the desalinated water storage tanks. The water from that tank then provides all of the clean water suitable for various plant services, including feed to the demineralized water and potable water systems, and use by the fire protection and essential service water systems. This encompasses all of the plant water demands, with the exception of Circulating Water System makeup and UHS makeup during emergency conditions.

Sections 9.2.9.1 through 9.2.9.7 are added as a supplement to the U. S. EPR FSAR.

9.2.9.1 Design Basis

No cross connections exist between raw Chesapeake Bay water supplied to the desalinization plant and any system with the potential to carry radioactive material. This design requirement satisfies Criterion 60 of Appendix A to 10 CFR 50 (CFR, 2008).

Raw water from the Circulating Water System Makeup Water System is supplied to the desalinization plant. Desalinated water is then supplied to the demineralized water, potable water, fire protection, and essential service water (except under emergency operating conditions) systems during periods of normal power operation, shutdown, maintenance and construction. The emergency makeup to essential service water is provided by a dedicated, safety-related system. The UHS Makeup Water System is discussed in Section 9.2.5.

9.2.9.2 System Description

Raw water is delivered to the desalinization plant through a non-safety-related line. The desalinization plant is a non-safety-related, non-seismic system that provides all of the water for plant use, with the exception of Circulating Water System Makeup and, under emergency conditions, ESWS makeup.

The desalinization plant supplies water for initial fill and makeup to the following systems:

- Essential service water during all but emergency conditions.
- Demineralized water.
- Potable water.
- Fire protection.

The raw water/desalinated water supply is schematically represented in Figure 9.2-7.

Raw water is supplied by diverting part of the Circulating Water System makeup flow. The Circulating Water system makeup pumps provide the motive force for this diversion flow, which is directed to the desalinization plant located adjacent to the Circulating Water System cooling tower.

The raw water is processed through desalinization, which consists of filtration, reverse osmosis and chemical treatment, and then sent to the desalinated water storage tank. From the storage tank, the desalinated water is distributed to the demineralized water, potable water, fire protection, and essential service water systems for their initial fill, and as needed for makeup. Emergency makeup to the ESWS is provided by the dedicated UHS Makeup Water System, described in Section 9.2.5.

During normal operation, desalinated water demand is approximately 812 gpm (3,073 lpm). Peak demand of approximately 2,416 gpm (9,145 lpm) occurs for approximately 4 to 6 hours during normal plant shutdown/cooldown operations, and is driven by additional makeup to the ESWS.

9.2.9.3 Component Descriptions

Raw Water Piping

Raw water flows from the Circulating Water System Makeup System to the desalinization plant through an underground pipe.

Desalinization Plant

The desalinization plant consists of pumps, tanks, filters, reverse osmosis and other process equipment necessary for desalinating the brackish Chesapeake Bay water.

Desalinated Water Storage Tank

There are two 300,000 gallon (1.14 million liter) tanks, which are sized for 8 hours of storage at the maximum desalinated water production rate of 1225 gpm (4637 lpm). The tanks are equipped with level sensors, a vent, a drain and an overflow line.

Desalinated Water Transfer Pumps

These are horizontal centrifugal pumps that forward water to the supplied systems. Each pump is equipped with a discharge check valve, suction and discharge isolation valves, and a recirculation line for maintaining system pressure while meeting minimum flow requirements. Two 100% capacity transfer pumps supply the demands of essential service water, fire protection and feed to the demineralized water system. A second pair of 100% capacity pumps is provided for potable water demand. Duplicate full capacity transfer pumps makes online inspection and maintenance of these pumps possible without unduly affecting system operation.

Desalinated Water Distribution Piping and Valves

The piping and valves which connect the system components to each other and to the supplied systems are made of materials compatible with the process fluid.

9.2.9.4 Safety Evaluation

Raw water supply and the desalinization plant provide no safety-related function. Therefore, no safety evaluation is required with respect to plant design basis events.

There is no connection between raw water supplied to the desalinization plant, or the desalinization plant itself, and components or other systems that have the potential to carry radiological contamination. This complies with Criterion 60 of Appendix A to 10 CFR 50 (CFR, 2008).

With respect to potential flooding caused by failures of piping or components, the raw water delivery piping and the desalinization plant are located remote from any safety related systems or equipment, except for the lines connecting to the ESWS cooling tower basins. Failures will not adversely impact safety functions because intervening topography and the plant storm water controls are designed to divert surface water flow, including that which would result from catastrophic failure of the desalinated water storage tanks. The system boundary from the nonsafety-related RWSS to the safety-related ESWS occurs at the ESWS isolation valve located in the pumphouse buildings.

Evaluation of the impact of a failure of the nonsafety-related RWSS piping on the ESWS pumphouse buildings and ESWS cooling towers indicates that the RWSS piping has no impact on the ability of the ESWS pumphouse buildings and ESWS cooling towers to meet their intended safety function.

9.2.9.5 Inspection and Testing Requirements

Visual inspections are conducted during construction to verify that the as-built condition is in accordance with design documents. Pressure testing and functional testing are conducted during post-construction pre-commissioning and startup, as necessary to confirm system integrity and proper operation of individual components and the total system. Portions of the system are demonstrated with leak testing where such method does not jeopardize other systems/equipment and is sufficient to demonstrate proper operation.

Ongoing system operation provides continuing demonstration of the system's functionality.

9.2.9.6 Instrumentation Requirements

Instrumentation includes sensing and display of various parameters as necessary to automate system function, and to provide for local and remote system monitoring, including alarms. These parameters include desalinization system tank levels, flows, temperatures and pressures, as well as desalinated water tank level and temperature, essential service water makeup flow, demineralized water system feed flow, and potable water system feed flow. Valve position indication for selected valves and pump power on/off indication are also provided.

9.2.9.7 References

CFR, 2008. Control of Releases of Radioactive Materials to the Environment, Title 10, Code of Federal Regulations, Part 50, Appendix A, General Design Criterion 60, U. S. Nuclear Regulatory Commission, 2008.}

Figure 9.2-1— {Potable Water System}

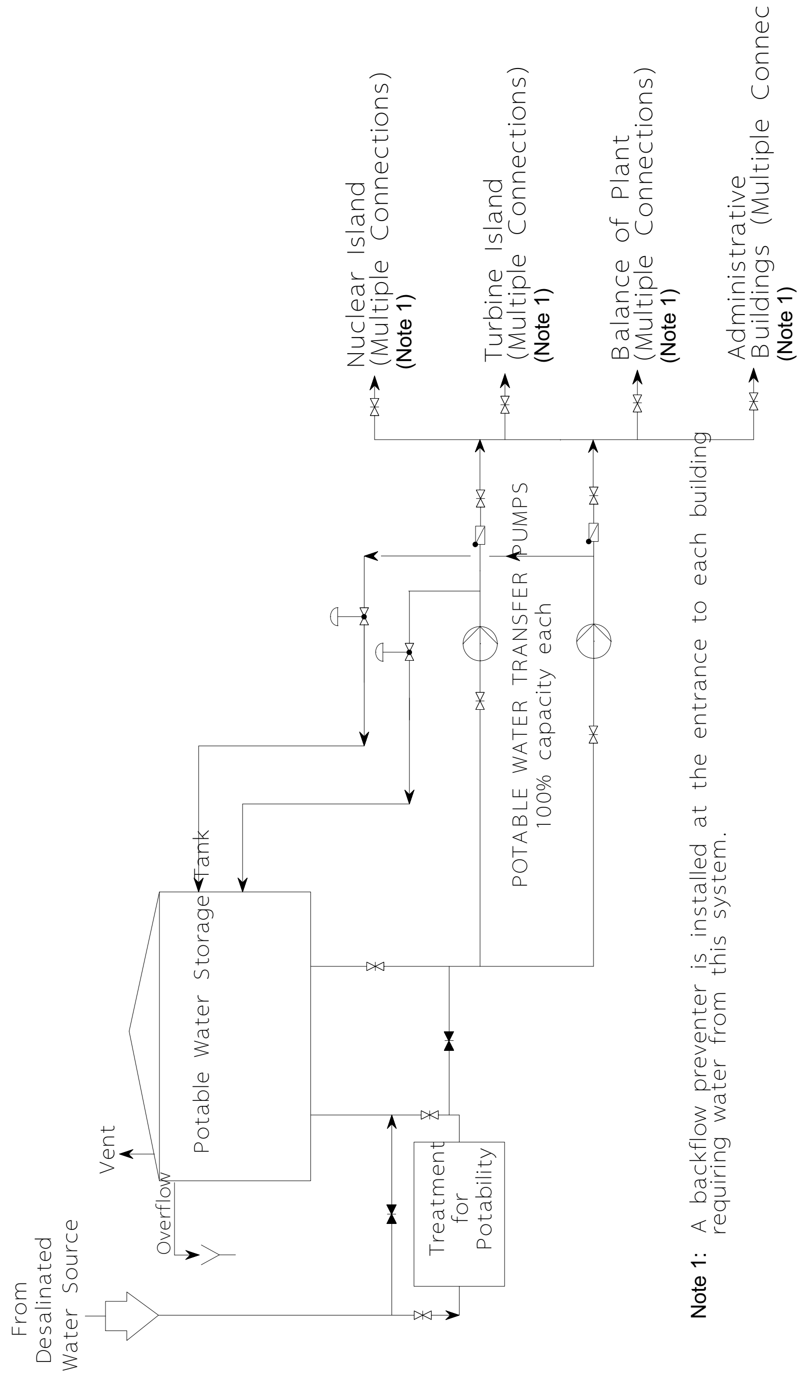


Figure 9.2-2— {Sanitary Waste Water System}

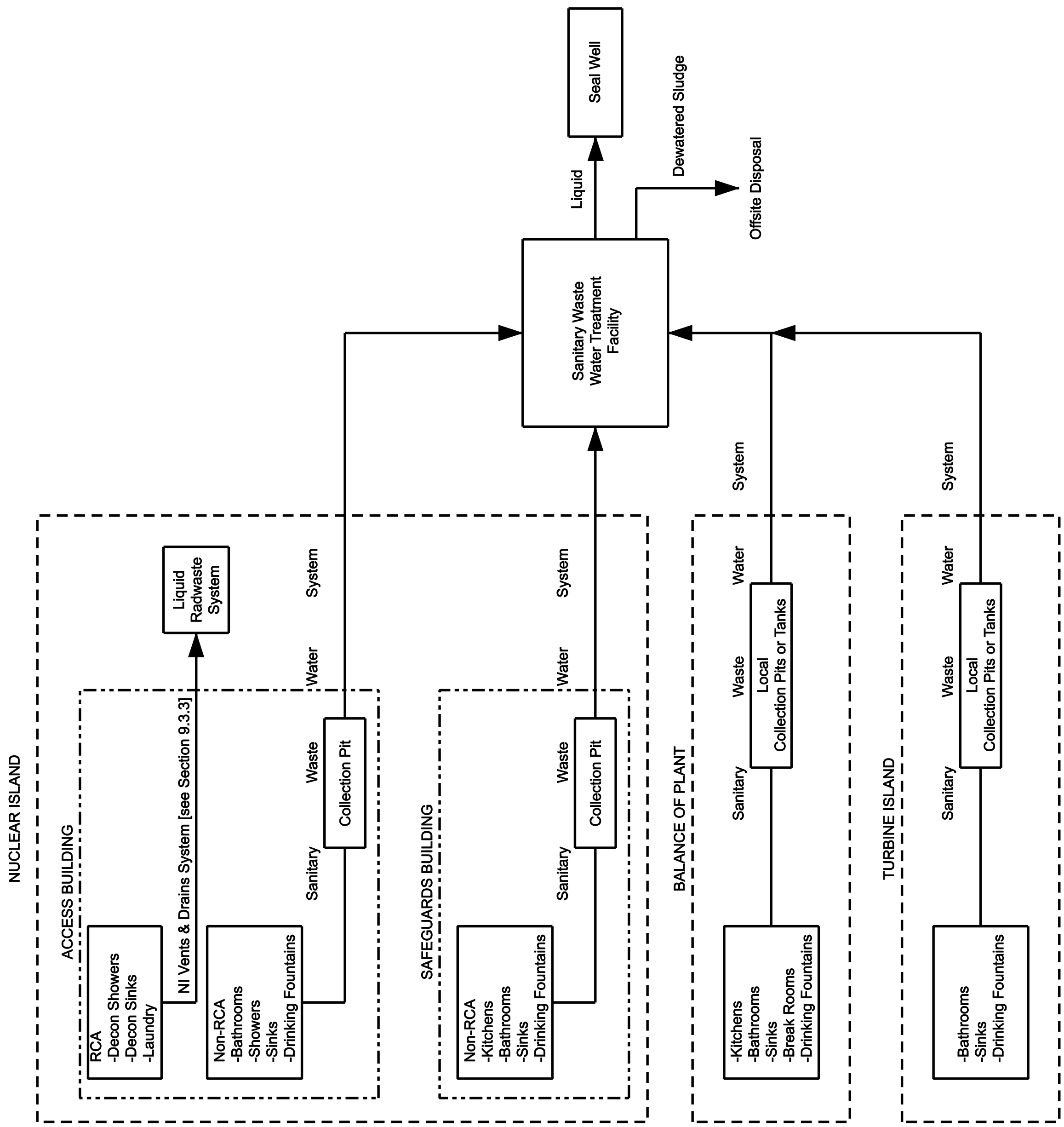
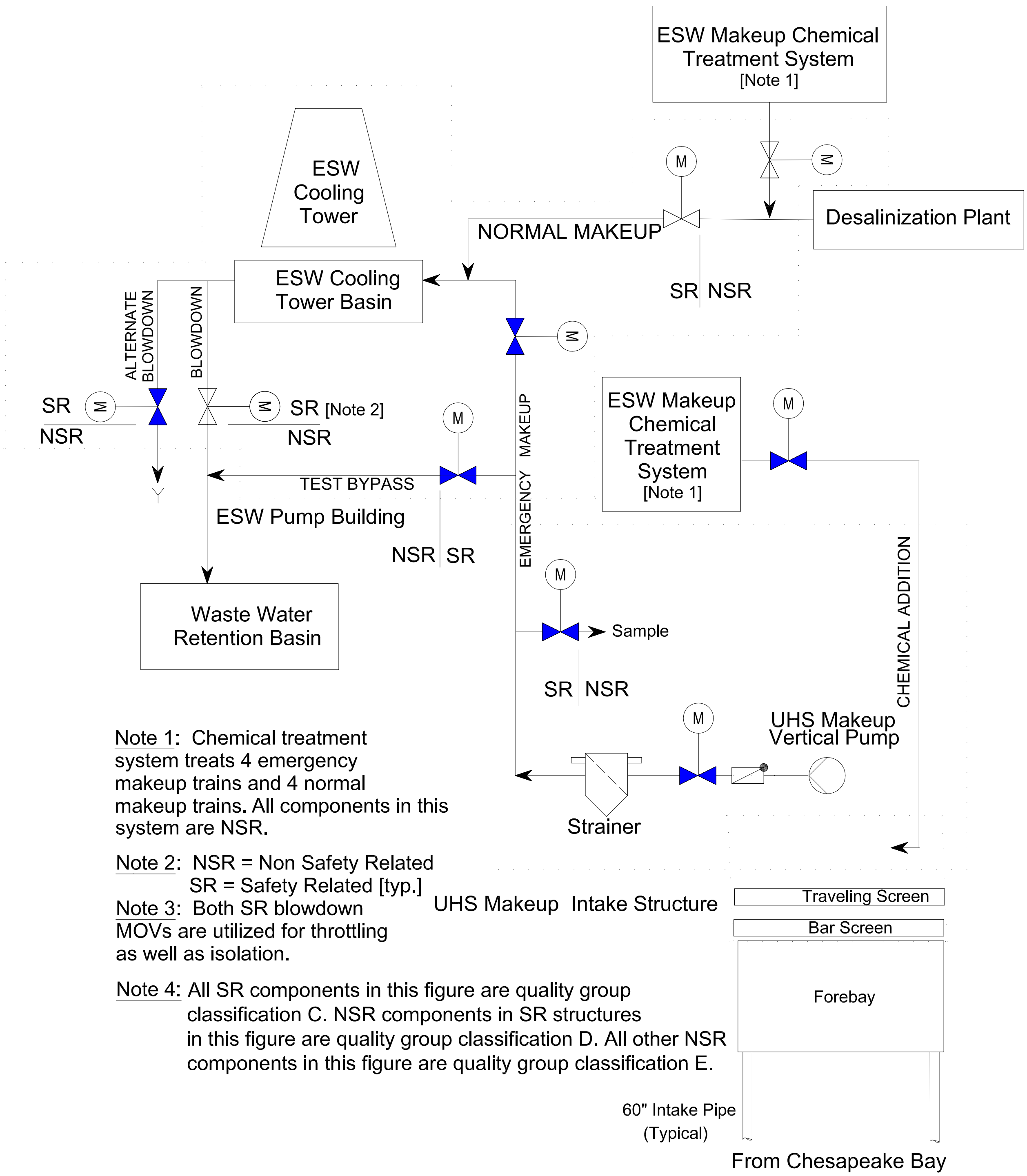


Figure 9.2-3— {Normal Makeup, Emergency Makeup, Blowdown & Chemical Treatment}
(Typical for each of 4 independent trains)



Note 1: Chemical treatment system treats 4 emergency makeup trains and 4 normal makeup trains. All components in this system are NSR.

Note 2: NSR = Non Safety Related
SR = Safety Related [typ.]

Note 3: Both SR blowdown MOVs are utilized for throttling as well as isolation.

Note 4: All SR components in this figure are quality group classification C. NSR components in SR structures in this figure are quality group classification D. All other NSR components in this figure are quality group classification E.

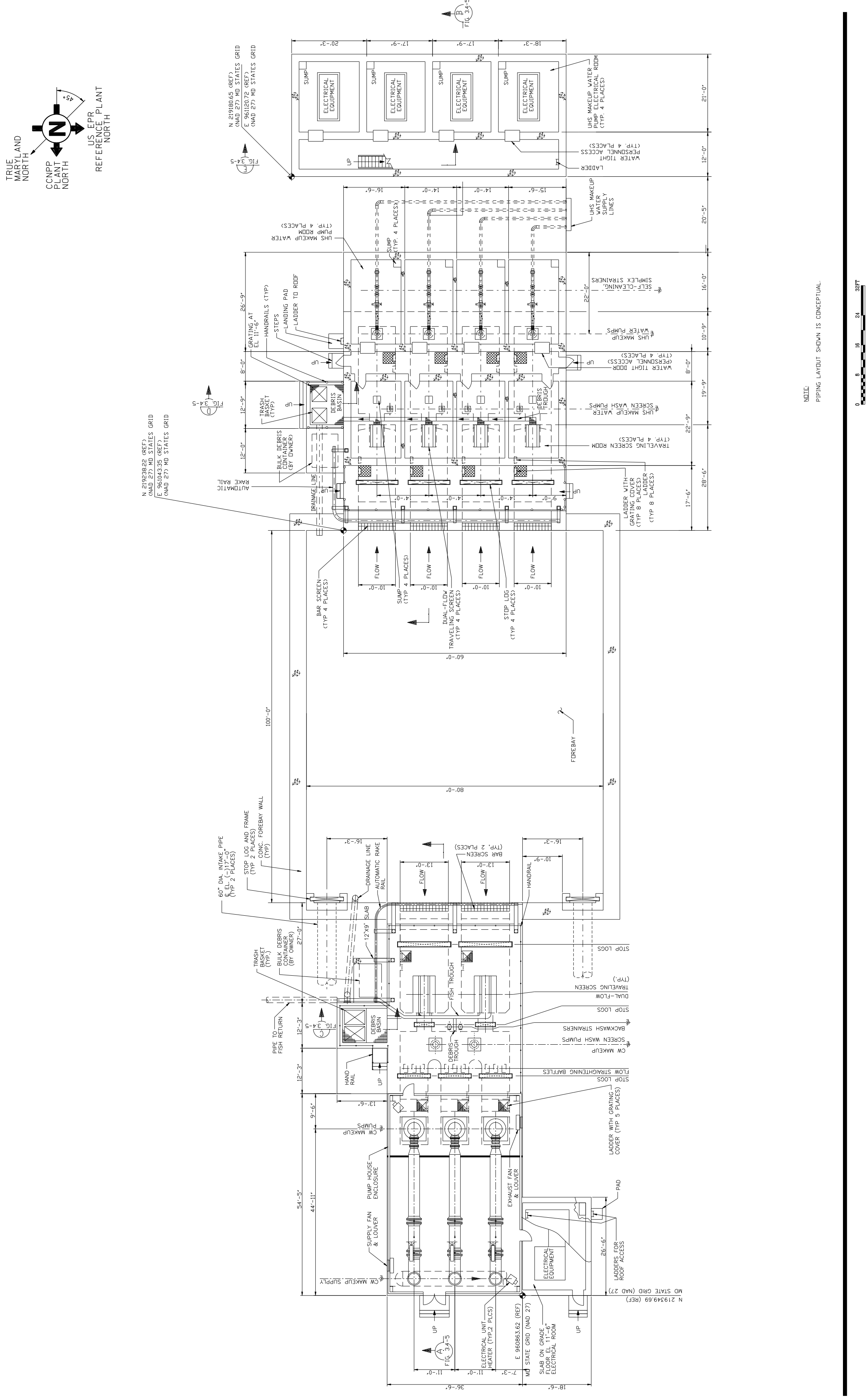


Figure 9.2-4— {General Area - UHS Makeup Water and CW Intake Structures}

Figure 9.2-5— {UHS Makeup Water Intake Structure - Plan View}

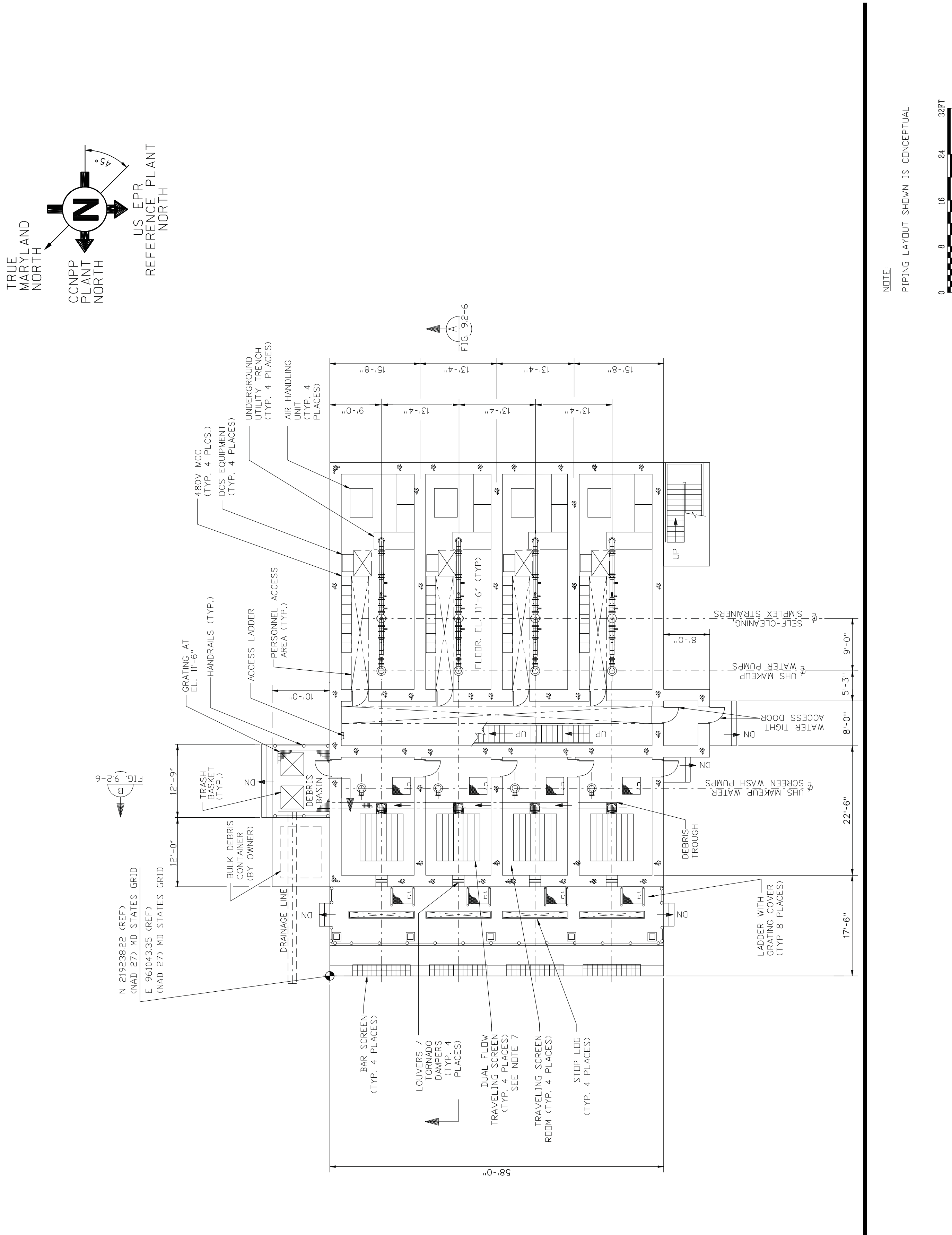


Figure 9.2-6— {UHS Makeup Water Intake Structure - Section View}

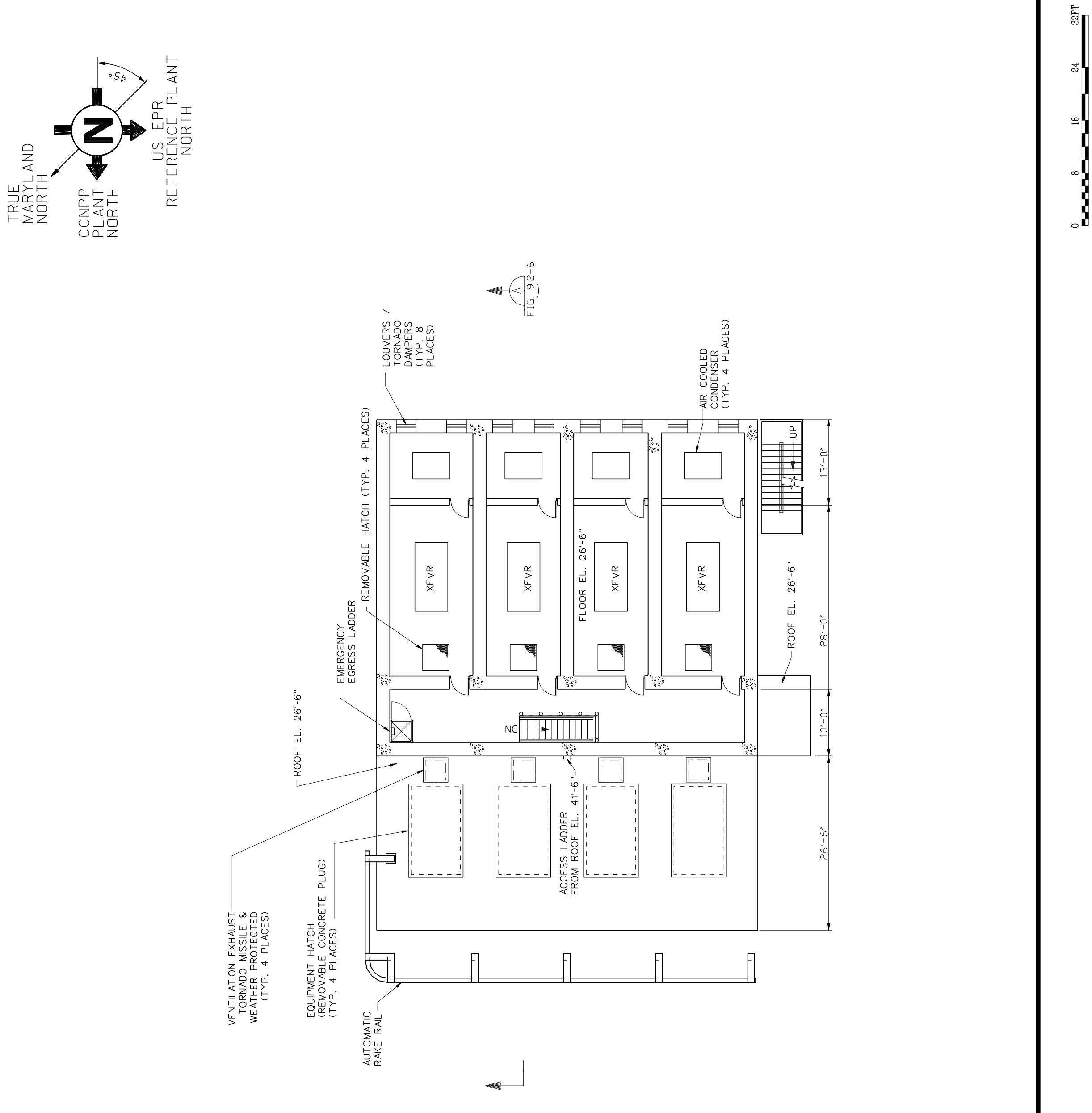


Figure 9.2-7— {Raw Water and Desalinated Water Supply}

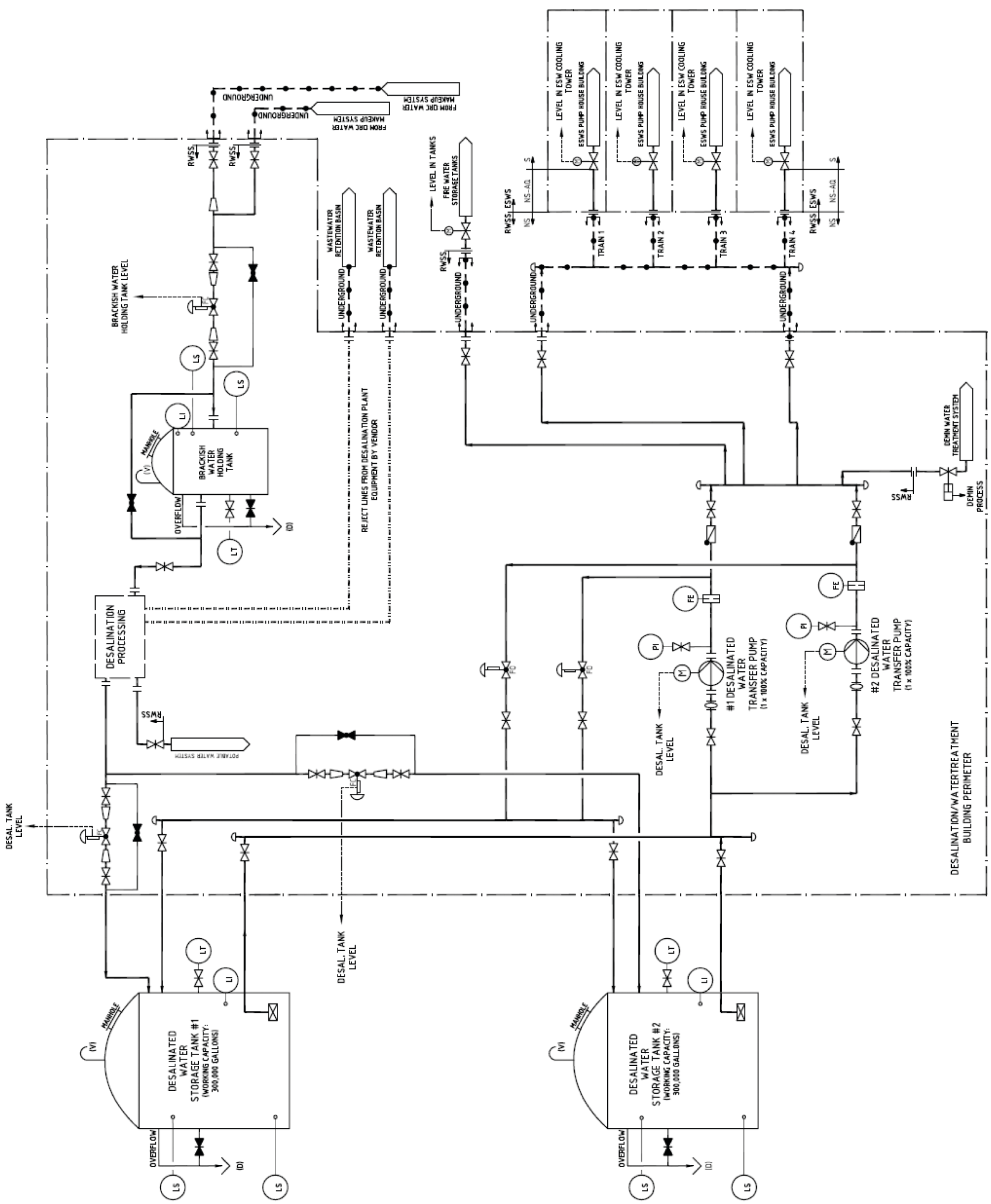
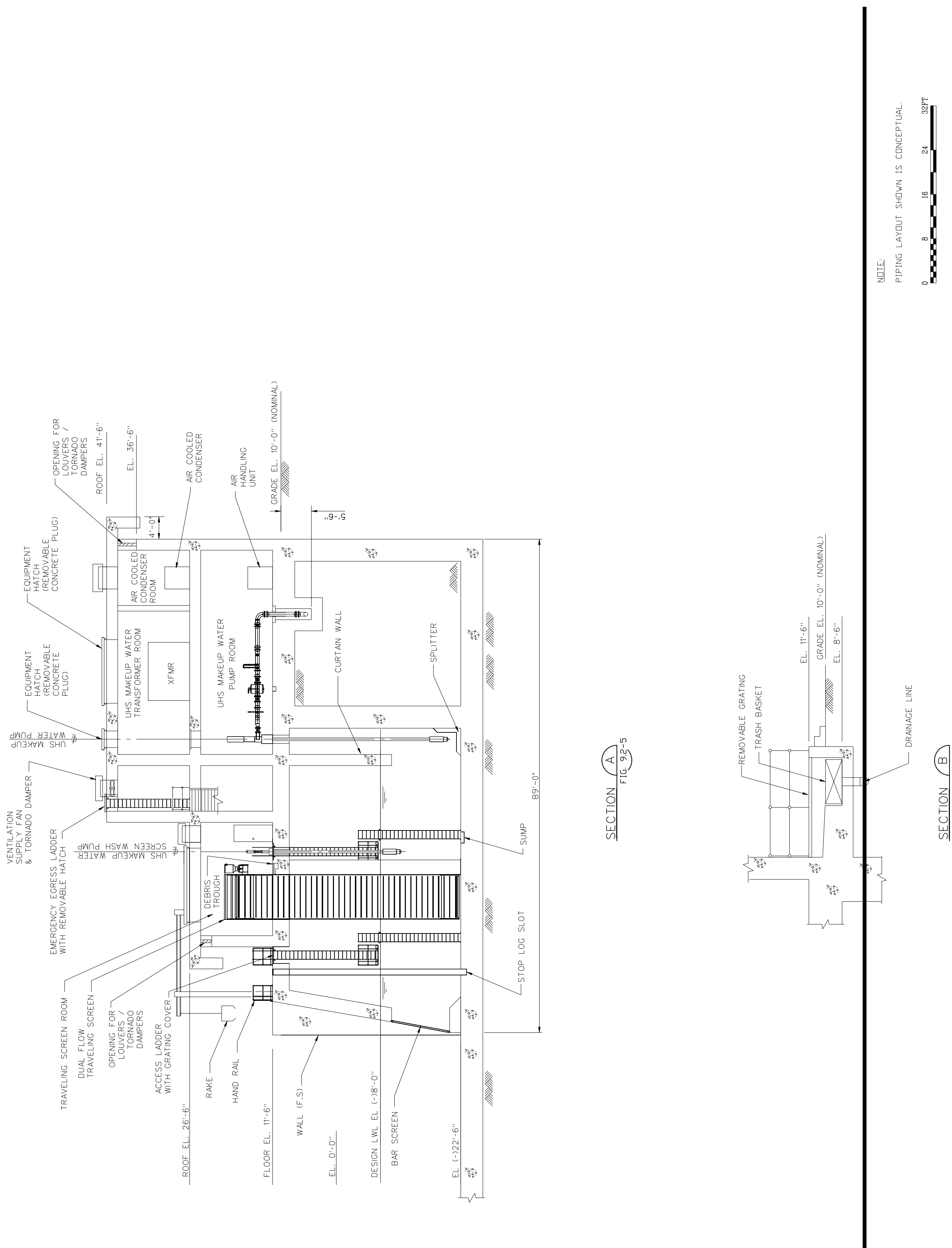


Figure 9.2-8— {UHS Makeup Water Intake Structure - Section View}



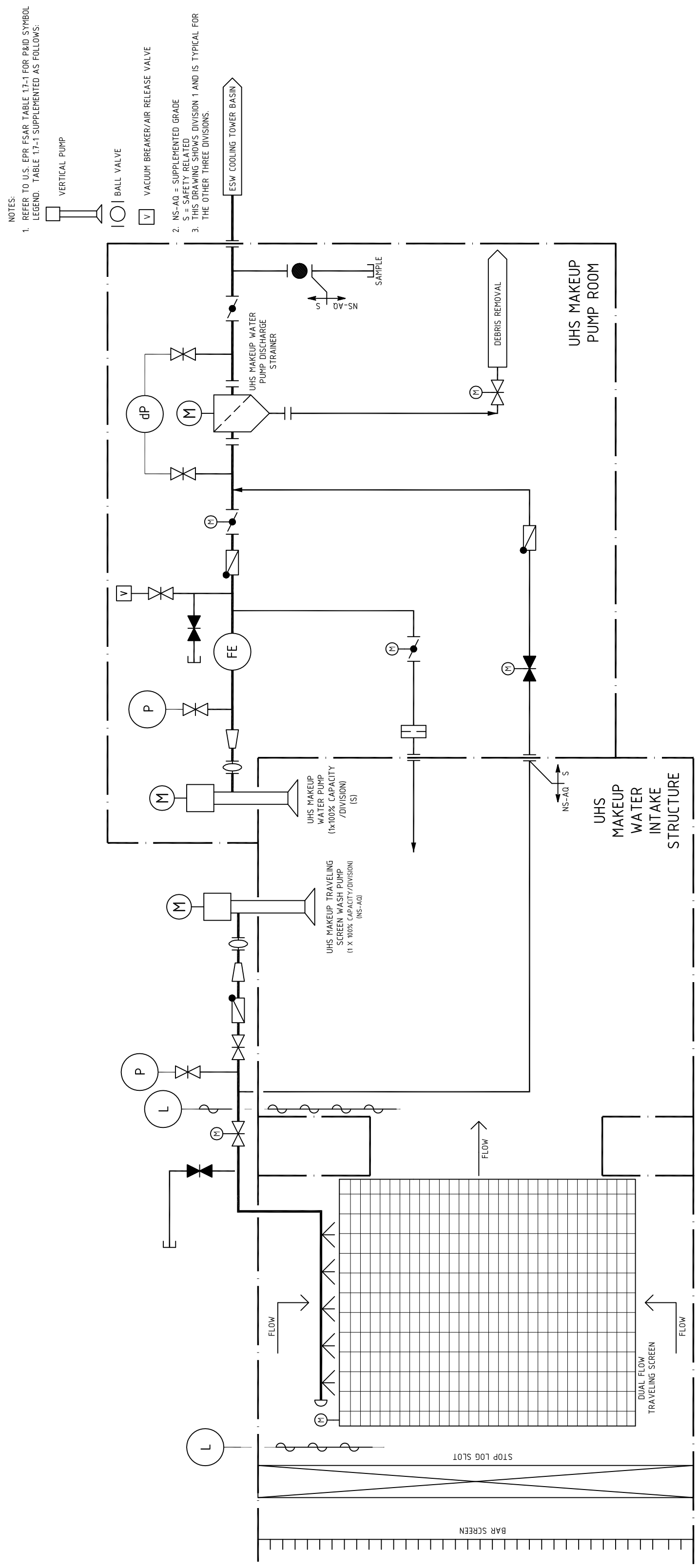


Figure 9.2-9— {UHS Makeup Water System}

9.3 PROCESS AUXILIARIES

This section of the U.S. EPR FSAR is incorporated by reference.

9.4 AIR CONDITIONING, HEATING, COOLING AND VENTILATION SYSTEMS

This section of the U.S. EPR FSAR is incorporated by reference with the following supplements.

9.4.1 Main Control Room Air Conditioning System

{No departures or supplements.}

9.4.1.1 Design Bases

{This section of the U.S. EPR FSAR is incorporated by reference with the departures described below:

For CCNPP Unit 3, detection of toxic gases and subsequent isolation of the CRE is not required and is not part of the design basis. The evaluation of the CCNPP Unit 3 toxic chemicals in Section 2.2.3 did not identify any credible toxic chemical accidents that exceeded the limits established in Regulatory Guide 1.78 (NRC, 2001). No specific provisions are required to protect the operators from an event involving a release of a toxic gas. As a result, toxic gas detectors and isolation are not required and will not be provided at CCNPP Unit 3.}

9.4.1.2 System Description

9.4.1.2.1 General Description

{This section of the U.S. EPR FSAR is incorporated by reference with the departures described below.

For CCNPP Unit 3, toxic gas sensors are not required and are not included in the system description. The evaluation of the CCNPP Unit 3 toxic chemicals in Section 2.2.3 did not identify any credible toxic chemical accidents that exceeded the limits established in Regulatory Guide 1.78 (NRC, 2001). No specific provisions are required to protect the operators from an event involving a release of a toxic gas.}

9.4.1.2.2 Component Description

{No departures or supplements.}

9.4.1.2.3 System Operation

{This section of the U.S. EPR FSAR is incorporated by reference with the departures described below.

For CCNPP Unit 3, toxic gas sensors are not required and are not included in the system operation. The evaluation of the CCNPP Unit 3 toxic chemicals in Section 2.2.3 did not identify any credible toxic chemical accidents that exceeded the limits established in Regulatory Guide 1.78 (NRC, 2001). No specific provisions are required to protect the operators from an event involving a release of a toxic gas.}

9.4.1.3 Safety Evaluation

No departures or supplements.

9.4.1.4 Inspection and Testing Requirements

No departures or supplements.

9.4.1.5 Instrumentation Requirements

No departures or supplements.

9.4.1.6 References

{**NRC, 2001.** Evaluating the Habitability of a Nuclear Power Plant Control Room During a Postulated Hazardous Chemical Release, Regulatory Guide 1.78, Revision 1, U. S. Nuclear Regulatory Commission, December 2001.}

9.4.2 Fuel Building Ventilation System

No departures or supplements.

9.4.3 Nuclear Auxiliary Building Ventilation System

No departures or supplements.

9.4.4 Turbine Island Ventilation System

This section of the U.S. EPR FSAR is incorporated by reference with the following supplements.

The U.S. EPR FSAR includes the following COL Items in Section 9.4.4:

> A COL applicant that references the U.S. EPR design certification will provide site-specific design information for the turbine building design information for the turbine building ventilation system (TBVS).
>
> A COL applicant that references the U.S. EPR design certification will provide site-specific design information for the switchgear building ventilation system (SGBVS).

The COL Items are addressed as follows:

The site-specific design information for the turbine building ventilation system is provided in sections 9.4.4.1 through 9.4.4.6.3

{The SGBVS information will be included when the detailed design is sufficiently complete. The information and conclusions are expected to be similar to that provided for the TBVS in Sections 9.4.4.1 through 9.4.4.6.}

9.4.4.1 Design Basis

The turbine building does not contain safety-related equipment. Therefore, the Turbine Building Ventilation System does not serve any safety-related function, has no safety design basis, and is not required to operate during or following a design basis accident. As such, single failure, environmental qualification and redundancy are not applicable to the Turbine Building Ventilation System.

The Turbine Building Ventilation System operates during startup, shutdown, and normal plant operations to maintain acceptable air temperatures in the Turbine Building for equipment operation and for personnel working in the building. The system is not relied upon during Station Blackout and Abnormal (e.g. Loss of Off-Site Power) operation.

The Turbine Building Ventilation system is sized to provide the heating, ventilation, and cooling requirements during startup, shutdown, and normal plant operations. The system is designed to maintain a positive pressure to mitigate intrusion of dust and dirt into the Turbine Building.

The ambient outside design conditions for the Turbine Building Ventilation System are established as -10°F for the minimum temperature and 100°F for maximum temperature. The Turbine Building Ventilation System maintains the bulk average temperature within the Turbine Building during normal plant operation at or above 50°F during winter design conditions and at or below 115°F during summer design conditions.

The rate of ventilation is based on maintaining permissible temperatures in areas with appreciable heat gains. For areas with no appreciable heat gains, the rate of ventilation is based on the number of air changes per hour, depending on the specific area being ventilated.

The Turbine Building Ventilation System provides the following functions:

- Maintain personnel comfort in normally occupied areas of the building
- Maintain closed space ambient conditions for proper equipment operation within the Turbine Building
- Remove heat generated by equipment
- Provide fire dampers to separate the different fire zones
- Smoke venting of the turbine hall
- Availability of system operation with manual or automatic actuation for essential system functions

9.4.4.2 System Description

The Turbine Building Ventilation System is shown in Figure 9.4-2.

Outside air is supplied to the Turbine Building by fans via intake louvers and exhausted to the atmosphere by roof exhaust ventilators. During normal operation outside air is mixed with recirculated air to maintain a positive pressure in the Turbine Building.

The Turbine Building Ventilation System removes heat generated by equipment and from the environment to maintain acceptable indoor ambient conditions. Unit heaters are used to maintain the minimum room temperatures within the Turbine Building.

An air conditioning unit in the sampling room located on the basement floor maintains the sample lab equipment at a design minimum temperature of 50°F, and a design maximum temperature of 95°F.

There are no radiation or safety actuation signals associated with the Turbine Building Ventilation System. No Turbine Building Ventialtion System realignment or operator action is required in response to plant radiation or actuation signals.

The Turbine Building Ventilation System is designed as a non seismic system since there are no seismic Category I SSCs inside the Turbine Building.

9.4.4.2.1 Component Description

The following components are designed to the codes and standards identified below.

Air Conditioning Unit

The air conditioning unit for the sampling room is located on the basement floor of the Turbine Building. The cooling and heating coils are designed per ASME AG-1-2003 (ASME, 2003).

Ventilation Fans

Two basic types of ventilation fans are used for air supply, exhaust, and recirculation. These are propeller fans for low pressure, and axial fans for higher pressure (ducted) applications. Fan performance is rated to Air Moving and Conditioning Association ANSI/AMCA 210 (ANSI, 1999), ANSI/AMCA 211 (ANSI, 1987), and ANSI/AMCA 300 (ANSI, 1985).

Roof Exhaust Fans

To maintain acceptable pressures within the building, roof exhaust fans are provided which work in conjunction with the relief vents. Fan performance is rated to Air Moving and Conditioning Association ANSI/AMCA 210 (ANSI, 1999), ANSI/AMCA 211 (ANSI, 1987), and ANSI/AMCA 300 (ANSI, 1985).

Relief Vents

Supply fans that are associated with relief vents are capable of recirculating the air as well as providing air to a room. The relief vents provide a flow out of the room. The relief vents are designed per ASME AG-1-2003 (ASME, 2003).

Electric and Hot Water Space Heaters

To maintain the minimum room temperatures within the Turbine Building, electric unit heaters or hot water space heaters are provided. Hot water space heaters are supplied from the space heating system with either the secondary steam or auxiliary boiler. Heaters are designed to commercial standards.

Air Filters

Air filters are provided for various fans to reduce the amount of dust within the ventilated area. The air conditioning unit contains a high efficiency air filter to reduce the amount of dust on the cooling coils. The remaining filters use moderate efficiency filters. The filters are replaceable modular filter elements. The filters are designed per ASME AG-12003 (ASME, 2003).

Louvers

Outside air is supplied by fans via intake louvers. The louvers are designed per ASME AG-1-2003 (ASME, 2003).

Dampers (manual, pneumatic, motor-operated, fire)

Manual dampers are used in the ducted system to balance airflow.

Pneumatic dampers are used to control the flow of the air through the various ductwork branches and to maintain a slight positive pressure in the building. In cases where the dampers modulate (i.e., variable intake/recirculation supplies), the dampers are of opposed blade design. Dampers used for shut-off are of parallel blade design. Motor operated dampers fail "as-is" in the case of power loss. Dampers in ductwork that exceed certain higher flow rates use airfoil shaped blades. This minimizes the pressure drop across the damper.

When ductwork passes through a fire barrier wall, fire dampers are installed in the wall with the ductwork mounted on either side. Duct access is provided for inspecting and replacing fire damper fusible links. The fire dampers have a fire rating consistent with the associated fire barrier wall rating. The dampers are designed per ASME AG-1-2003 (ASME, 2003) and UL 555-2006 (UL, 2006).

9.4.4.2.2 System Operation

The Turbine Building Ventilation System is manually controlled. Roof exhaust fans and supply fans are manually started and stopped as required to satisfy space temperature conditions and to maintain a positive pressure in the Turbine Building.

Electric unit heaters and hot water space heaters are controlled automatically or manually. In the automatic mode, the electric unit heater fan motors are thermostatically controlled by their respective space thermostats. The space heating system supplies hot water to the hot water space heaters from either the secondary steam or auxiliary boiler.

9.4.4.3 Safety Evaluation

The Turbine Building Ventilation System performs no safety-related functions; therefore a systems failure analysis is not required. The Turbine Building Ventilation System is not required to operate during or following a design basis accident.

There are no safety-related SSCs or important to safety SSCs in the Turbine Building; therefore GDC 2 is not applicable to the Turbine Building Ventilation System.

The non-safety Turbine Building Ventilation System shares no SSCs between units, therefore this does not adversely impair any safety-related system, as required by GDC 5.

The Turbine Building Ventilation System is not exposed to any radiological contamination; therefore the requirements of GDC 60 are not applicable.

9.4.4.4 Inspection and Testing Requirements

Shop inspection and testing are performed by the manufacturer for major components, including heating and cooling coils and controls.

The Turbine Building Ventilation System is designed to permit periodic inspection of system components during normal plant operation.

Fans are rated and tested in accordance with the standards of Air Moving and Conditioning Association (ANSI/AMCA 210 (ANSI, 1999), ANSI/AMCA 211 (ANSI, 1987), and ANSI/AMCA 300 (ANSI, 1985).

The performance and testing requirements of the dampers are per ASME AG-1-2003 (ASME, 2003).

The filters meet the specifications of ANSI/ASHRAE Standard 52.2 (ANSI/ASHRAE, 1999).

The ductwork meets the design, construction, and testing requirements of ASME AG-1-2003 (ASME, 2003).

9.4.4.5 Instrumentation Requirements

Indication of the operational status of the equipment, position of remote operated dampers, instrument indications and alarms are provided in the Main Control Room (MCR). Fans, motor-operated dampers, and electric unit heaters are manual and auto-operable from the MCR.

9.4.4.6 References

ANSI, 1985. Air Moving and Conditioning Association (ANSI/AMCA) 300, Reverberant Room Method of Testing Fans for Rating Purpose, American National Standards Institute, 1985.

ANSI, 1987. Air Moving and Conditioning Association (ANSI/AMCA) 211, Certified Ratings Program-Air Performance, American National Standards Institute, 1987.

ANSI, 1999. Air Moving and Conditioning Association (ANSI/AMCA) 210, Laboratory Methods of Testing Fans of Aerodynamics Performance Rating, American National Standards Institute, 1999.

ANSI/ASHRAE, 1999. Standard 52.2, Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size, American National Standards Institute, 1999.

ASME, 2003. ASME AG-1-2003, Code of Nuclear Air and Gas Treatment, American Society of Mechanical Engineers, 2003.

UL, 2006. Underwriters Laboratories' Standard UL 555, Standard for Safety Fire Dampers, 2006.

9.4.5 Safeguard Building Controlled-Area Ventilation System

No departures or supplements.

9.4.6 Electrical Division of Safeguard Building Ventilation System (SBVSE)

No departures or supplements.

9.4.7 Containment Building Ventilation System

No departures or supplements.

9.4.8 Radioactive Waste Building Ventilation System

No departures or supplements.

9.4.9 Emergency Power Generating Building Ventilation System

No departures or supplements.

9.4.10 Station Blackout Room Ventilation System

No departures or supplements.

9.4.11 Essential Service Water Pump Building Ventilation System

No departures or supplements.

9.4.12 Main Steam and Feedwater Valve Room Ventilation System

No departures or supplements.

9.4.13 Smoke Confinement System

No departures or supplements.

9.4.14 Access Building Ventilation System

No departures or supplements.

9.4.15 {UHS MAKEUP WATER INTAKE STRUCTURE Ventilation System

The section was added as a supplement to the U.S. EPR FSAR.

9.4.15.1 Design Bases

The UHS Makeup Water Intake Structure Ventilation System maintains acceptable temperatures to support operation of the UHS Makeup Water Intake System pumps and associated electrical distribution equipment, which are required to operate under design basis accident conditions. The UHS Makeup Water Intake Structure Ventilation System also maintains acceptable room temperatures within the intake structure corridors and the traveling screen rooms. The UHS Makeup Water Intake Structure Ventilation System maintains a minimum temperature of 41° F (5° C) and a maximum temperature of 104° F (40° C) in the UHS Makeup Water Intake Structure , based on the 0% exceedance winter design basis outdoor ambient air temperature of 0°F DB, and the 0% exceedance summer design-basis outdoor ambient air temperatures of 102°F DB/ 80°F WB, repectively. The system support operation of the UHS Makeup Water Intake System pumps, dual flow traveling screens, screen wash pumps, and associated electrical distribution equipment as well as to support personnel access to these spaces. This temperature range maintains a mild environment in the building, as defined in US EPR FSAR Section 3.11.

Components of the UHS Makeup Water Intake Structure Ventilation System are located inside the applicable divisions' UHS Makeup Water Pump rooms, transformer rooms, air-cooled condenser rooms, the intake structure corridors and traveling screen rooms. The UHS Makeup Water pump, transformer and air-cooled condenser rooms are designed to withstand the effects of natural phenomena, such as earthquakes, tornadoes, hurricanes, floods, and external missiles (GDC-2). The Traveling Screen rooms are designed to withstand the effects of earthquakes, tornadoes, hurricanes and external missiles; however, their ventilation systems are NS-AQ, and are not required to operate following accidents.I

9.4.15.2 System Description

9.4.15.2.1 General Description

A drawing of the UHS Makeup Water Intake Structure Ventilation System is shown in Figure 9.4-2 The UHS Makeup Water Intake Structure Ventilation System consists of three (3) sub-systems: the makeup pump room ventilation system, the Intake Structure corridor ventilation system, and the traveling screen room ventilation system.

The UHS Makeup Water Intake Structure Ventilation System supplies conditioned air for cooling, heating, and ventilating each divisional UHS Makeup Water System pump and transformer room in the UHS Makeup Water Intake Structure. A safety-related split-system air conditioner is provided to cool and ventilate each UHS Makeup Water System pump and transformer room. Each air conditioning system recirculates room air and draws outside air to ventilate the rooms. The supply air flow path includes a missile-protected outside air intake, tornado damper, and an outside air makeup connection to the safety-related air handling unit, ducted from the air-cooled condenser room. The air-cooled condenser room forms the supply air plenum for the air-cooled condenser and the makeup air supply. Distribution ductwork supplies air from the air handling unit to the pump room and the transformer room above. Air is returned to the air handling unit via recirculation ductwork from the pump and transformer rooms. A nonsafety-related exhaust fan is provided to exhaust a portion of the room air. The exhaust air flow path consists of exhaust ductwork from each room drawn via an exhaust fan, which discharges into an exhaust plenum shared with the exhaust from the air-cooled condenser. The exhaust plenum discharges through the roof of the building through a check damper, tornado damper and missile shield.

Nonsafety-related supply and exhaust fans are provided to heat and ventilate the intake structure corridors. The supply air ductwork is provided with a duct heater to heat the supply air in the winter. Both supply and exhaust openings are protected from missiles and provided with tornado dampers.

Each traveling screen room is ventilated by a nonsafety-related exhaust fan which draws outside air through a supply air louver and filter. A unit heater is provided in each traveling screen room to maintain the minimum required temperature in the winter. Both supply and exhaust openings are protected from missiles and provided with tornado dampers.

9.4.15.2.2 Component Description

Air Conditioning (AC) Units

The air conditioning systems utilize safety-related split-system units. Each systems' air-cooled condenser section (i.e., condenser fan, coil and compressor) is located in its own room, which forms a supply air plenum to provide cooling air from outdoors via missile protected openings located above the EL. 36 ft. flood level. Each evaporator section (i.e., filter, evaporator coil, electric heating coil and supply air fan) is located in its divisional pump room. AC unit capacities are based on the design ambient conditions and the required room temperature range. The air conditioning equipment shall be designed in accordance with ASME AG-1 2003 (ASME, 2003).

Ductwork and Accessories

Ductwork is constructed of galvanized steel and is structurally designed for the fan shutoff pressure. The ductwork meets the design, construction and testing requirements of ASME AG-1-2003 (ASME, 2003).

Air Conditioning Unit Condensate Drip Pans

Each air conditioning unit has a drip pan installed to collect the condensate that forms in the evaporator section and directs the condensate to the local sump.

Air Supply Fans

Fans are centrifugal or axial type with electric motor drive. Fan performance is rated in accordance with ANSI/AMCA-210-1999 (ANSI, 1999), ANSI/AMCA-211-1987 (ANSI, 1987), and ANSI/AMCA-300-1985 (ANSI, 1985).

Unit Heaters

Unit heaters, consisting of fans, thermostats and electric heating coils are provided in each traveling screen room to maintain a minimum room temperature above the lower design temperature limit of 41°F, based on a minimum outside ambient temperature of 0°F. Unit heaters meet the design, construction and testing requirements of ASME AG-1-2003 (ASME, 2003).

Dampers

Dampers meet the design, construction and testing requirements of the applicable portions of ASME AG-1-2003 (ASME, 2003).

Electrical Duct Heater

An electric duct heater is provided to temper the air supplied to the UHS Makeup Water Intake Structure common corridors.

9.4.15.2.3 System Operation

Normal Plant Operation

During normal plant operation, the UHS Makeup Water System pumps are not in operation, except for the performance of periodic surveillance tests. The UHS Makeup Water Intake Structure Ventilation System functions to maintain acceptable room temperatures for starting and operating the UHS Makeup Water System pumps, traveling screens and screen wash pumps, as well as supporting the operation of the electrical distribution equipment for the UHS Makeup Water System and for personnel comfort. The room temperature is monitored and controlled using the temperature sensors located in each pump room, transformer room, the intake structure corridors and each traveling screen room. In the event cooling is required in any UHS Makeup pump or electrical room(s), the associated divisions' UHS Makeup Water System pump is started on high room temperature to supply cooling water to the associated division's cooling coils.

Abnormal Operating Conditions

The UHS Makeup Water System (UHSMWS) is comprised of four (4) independent trains, each supported by its dedicated, safety-related UHSMWS Ventilation System. Two out of the four trains are required for the UHSMWS to perform its safety function. If one or more components of a UHS Makeup Pump Room Ventilation System fail, that ventilation system may not be able to maintain the required ambient conditions in the associated UHS Makeup Water pump or transformer room. Failure of one UHS Makeup Pump Room Ventilation System may result in inoperability of that train of the UHS Makeup Water System. However, this failure does not affect the other three (3) redundant trains of the UHS Makeup Water Ventilation System. The heating and ventilating systems serving the UHS Makeup Water Intake Structure corridors and traveling screen rooms are NS-AQ, and not required to operate in order for any UHS Makeup Water System to perform its safety function.

Plant Accident Conditions

The UHS Makeup Water Intake Structure Ventilation System also maintains the required ambient conditions in each trains' UHS Makeup Water pump and transformer room, in case the UHS Makeup Water pumps are required to operate.

9.4.15.3 Safety Evaluation

The UHS Makeup Water Intake Structure Ventilation System has sufficient heating and cooling capacity to maintain each trains' pump and transformer room at temperatures between 41° F (5°C) and 104° F (40°C), when the UHS Makeup Water System equipment operates at rated load (cooling mode), and, is on standby (heating mode).

The safety-related portions of the UHS Makeup Water Intake Structure Ventilation System are designed to withstand the effects of earthquakes, tornadoes, hurricanes, floods, external missiles, and other similar natural phenomena. Sections 3.3, 3.4, 3.5, 3.7, and 3.8 provide the bases for the adequacy of the structural design of the building.

No single failure compromises the safety functions of the UHS Makeup Water System; however, active failure of an air conditioning system will render the associated UHS Makeup Water System inoperable. Power supplies to safety-related electrical components and controls for the UHS Makeup Water Intake Structure Ventilation System are provided from their respective divisional Class 1E Emergency Power Supply system.

9.4.15.4 Inspection and Testing Requirements

Sections 14.2.14.8 provides the initial plant startup testing for the UHS Makeup Water Intake Structure Ventilation System.

After the plant is brought into operation, periodic inspections and tests of the UHS Makeup Water Intake Structure Ventilation System are performed to verify proper operation. Scheduled inspections and tests are necessary to verify system operability.

Testing to verify the UHS Makeup Water Intake Structure Ventilation System continued capability to remove design heat loads will be coordinated with full flow performance testing of each division's respective UHS Makeup Water System to establish equipment room design basis heat loads to the maximum extent practical. Testing to verify the systems maintain the minimum room design temperature will be performed with all equipment secured.

9.4.15.5 Instrumentation Requirements

Initial in-place testing of safety-related components of the UHS Makeup Water Intake Structure Ventilation System is performed in accordance with ASME AG-1-2003 (ASME, 2003) and ASME N510-1989 (ASME, 1989).

9.4.15.6 References

ANSI, 1985. Reverberant Room Method for Sound Testing of Fans, ANSI/AMCA-300-1985, American National Standards Institute/Air Movement and Control Association International, Inc.,1985.

ANSI, 1987. Certified Ratings Program-Product Rating Manual for Fan Air Performance, ANSI/AMCA-211-1987, American National Standards Institute/Air Movement and Control Association International, Inc.,1987.

ANSI, 1999. Laboratory Methods of Testing Fans for Aerodynamic Performance Rating, ANSI/AMCA-210-1999, American National Standards Institute/Air Movement and Control Association International, Inc.,1999.

ASME, 1989. Testing of Nuclear Air-Treatment Systems, ASME N510-1989, American Society of Mechanical Engineers, 1989.

ASME, 2003. Code on Nuclear Air and Gas Treatment, ASME AG-1, American Society of Mechanical Engineers, 2003.}

9.4.16 FIRE PROTECTION BUILDING VENTILATION SYSTEM

This section was added as a supplement to the U.S. EPR FSAR.

The Fire Protection Building Ventilation System provides an environment suitable for the operation of the Fire Protection System pumps. This system provides an ambient air flow quantity to maintain a safe and satisfactory indoor environment for the operation of the fire protection pumps as well as to support personnel access to the three pump rooms.

9.4.16.1 Design Bases

The Fire Protection Building Ventilation System, located in the two, 100% capacity diesel engine driven pump rooms, is an augmented quality system designed to meet Seismic Category II-SSE requirements. The ventilation system in the electric motor driven pump room is a non-seismic, augmented quality system.

The Fire Protection Building Ventilation System maintains acceptable ambient conditions for the fire protection system diesel engine driven pumps, diesel fuel oil tanks, electric motor driven pump, jockey pump, pump drivers and controllers. The diesel engine driven pumps and associated equipment are required to operate after a seismic event.

The Fire Protection Building Ventilation System maintains a minimum temperature of 40°F, based on an ambient temperature of -10°F, and a maximum temperature of 120°F, based on an outside ambient temperature of 100°F. This system will support operation of the Fire Protection System pumps and drivers, as well as to support personnel access to these spaces.

Components of the Fire Protection Building Ventilation System are located inside the two diesel engine driven pump rooms and one electric motor driven pump room. Each pump room contains components of the ventilation system to modulate the temperature in there respective rooms.

9.4.16.2 System Description

9.4.16.2.1 General Description

The Fire Protection Building Ventilation System ventilates the two diesel engine driven pump rooms and the electric motor driven pump room, using outside air as the cooling medium. Wall mounted outside air intake louvers with motor operated dampers, electric unit heaters and exhaust fans service the Fire Protection Building. Each pump room has a separate and independent heating and ventilation system.

The heating and ventilation systems for each of the diesel engine driven pump rooms are identical. Each diesel pump room is supplied with wall mounted outside air intake louvers, with motor operated dampers, electric unit heaters, exhaust fans, engine combustion air inlet ductwork with air intake filter, and combustion gas exhaust ductwork for proper pump performance.

The electric motor driven pump room is supplied with wall mounted outside air intake louvers with motor operated dampers, electric unit heaters and an exhaust fan.

Ventilation of the Diesel Engine Driven Pump Rooms

During normal operating conditions the diesel engine driven pump rooms' ventilation system will use two 50% wall mounted intake air louvers for room ventilation air and ventilation air shall be exhausted by one 100% exhaust fan. The intake air louvers and exhaust fan are supplied with motor operated dampers. Both intake louvers and the exhaust fan are interlocked to modulate air flow based on the required minimum and maximum design temperatures.

During winter conditions, when the diesel engine driven pumps are not in operation, the air in the diesel engine driven pump room is heated by two electric unit heaters. These heaters are controlled by local thermostats to maintain the required minimum temperature.

Combustion air for the diesel engine driven pumps is supplied through duct located in each diesel engine driven pump room. Each combustion air inlet is supplied with an air intake filter, and each diesel pump supplied with a combustion gas exhaust duct for proper pump performance.

Ventilation of the Electric Motor Driven Pump Room

During normal operating conditions the electric motor driven pump room ventilation system uses two 50% wall mounted intake air louvers for room ventilation air. Ventilation air is exhausted by one 100% exhaust fan. The intake air louvers and exhaust fan are supplied with motor operated dampers. Both intake louvers and the exhaust fan are interlocked to modulate air flow based on the required minimum and maximum design temperatures.

During winter conditions the air in the electric motor driven pump room is heated by two electric unit heaters. These heaters are controlled by local thermostats to maintain the required minimum temperature.

9.4.16.2.2 Component Description

The major components for the Fire Protection Building Ventilation System are listed in the following paragraphs, along with the applicable codes and standards. Refer to Section 3.2 for more discussion of seismic and system quality group classifications.

Ductwork and Accessories

The supply air and exhaust gas ducts are constructed of galvanized sheet steel and are structurally designed for fan shutoff pressure. The ductwork meets the design, construction and testing requirements of ASME AG-1a-2004 (ASME, 2004).

Fans

The exhaust fans are centrifugal or propeller type with an electrical motor driver. Fan performance is rated in accordance with ANSI/AMCA 210-99 (ANSI, 1999), ANSI/AMCA-211-05 (ANSI, 2005a), and ANSI/AMCA-300-05 (ANSI, 2005b).

Electric Heater

Each electric heater is factory assembled with a fan, electric heating coil, adjustable air defectors and hanger support bracket. The unit heaters are provided with a local thermostat and control switch accessible from the floor area to maintain minimum room temperature.

Louver

Louver performance data shall be rated under the AMCA Certified Rating Program and shall bear the AMCA certified rating seal. The certified performance data shall include air flow pressure loss and water penetration (ANSI, 1995).

Motor Operated Dampers

The motor-operated dampers fail to the "open" position in the case of power loss. The performance and testing requirements of the dampers are in accordance with ASME AG-1a-2004 (ASME, 2004).

9.4.16.2.3 System Operation

Normal Plant Operation

During normal plant operation, the fire protection system pumps are not in operation, except for the jockey pump and periodic performance surveillance tests. The Fire Protection Building Ventilation System functions to maintain acceptable room temperatures for starting and operating the fire pumps. The room temperature is monitored by temperature sensors located in each pump room.

Abnormal Operating Conditions

Failure of Diesel Engine Driven Pump Room Air Supply

If one or more components for the ventilation system of a diesel engine driven pump room fails, the ventilation system for that room is unable to maintain the required ambient conditions. Since there are two redundant diesel engine driven pump rooms, with a separate ventilation system and air supply, the failure of the air supply in one diesel engine driven pump room does not affect the other diesel engine driven pump room.

Failure of Pump Room Electric Heating Coils

Each fire protection pump room has two electric unit heaters. In the case of failure of one electric heater, the other electric heater is able to maintain the required temperature in the pump room.

Failure of Electric Motor Driven Pump Room Air Supply

In the case of failure of a component on the ventilation system for the electric motor driven pump room, the required ambient conditions may not be maintained in the electric motor driven pump room. However, the diesel engine driven pumps are available to provide necessary fire protection if an event should occur.

Failure of Exhaust Components

In the case of failure of any of the Fire Protection Building Ventilation System exhaust components, proper ambient conditions may not be maintained. However, components in the other unaffected pump rooms are available to provide necessary ventilation for the unaffected pump rooms during an event.

Loss of Offsite Power

In the event of Loss of Offsite Power, the emergency power system is supplied to the Fire Protection Building Ventilation System diesel engine driven pump room components. Emergency power supply to the system enables it to maintain normal room design temperature conditions.

Station Blackout

In the event of Station Blackout, the emergency power system is supplied to the Fire Protection Building Ventilation System components. Emergency power supply to the system enables it to maintain normal room design temperature conditions.

9.4.16.3 Safety Evaluation

The Fire Protection Building Ventilation System is designed to maintain ambient conditions inside the Fire Protection Building to allow safe and reliable operation of the fire pumps. The maximum temperature of 120°F in the pump rooms is the design temperature based on an outside ambient temperature of 100°F and room equipment heat loads. The equipment inside the pump rooms is designed to withstand a temperature of 120°F. A minimum temperature of 40°F will be maintained in the building based on a minimum ambient temperature of -10°F.

The Fire Protection Building Ventilation System is located inside each pump room of the Fire Protection Building, which is designed to withstand the effects of a safe shutdown earthquake (SSE). Chapter 3 provides the bases for adequacy of the structural design of the Fire Protection Building.

The diesel engine pump rooms' ventilation systems remain functional after an SSE event. Chapter 3.2 provides additional discussion of the seismic requirements for the Fire Protection System.

The two identical diesel engine driven pumps and diesel pump room ventilation systems provides redundancy to the ventilation system. Therefore, no single failure of the ventilation system compromises the safety function of the system. Vital power is supplied from onsite or offsite power systems.

9.4.16.4 Inspection and Testing Requirements

Acceptance testing of the Fire Protection Building Ventilation System components is performed in accordance with ASME AG-1a-2004 (ASME, 2004) and ASME N510-1989 (ASME, 1995).

9.4.16.5 Instrumentation Requirements

Indication of the operational status of the equipment, position of dampers, instrument indications and alarms are provided in the Main Control Room (MCR). Fans, motor-operated dampers, and electric unit heaters can be operated from the MCR. The fire detection and sensor information is delivered to the fire detection system.

9.4.16.6 References

ASME, 2004. Code on Nuclear Air and Gas Treatment, ASME AG-1a-2004, American Society of Mechanical Engineers, 2004.

ASME, 1995. Testing of Nuclear Air-Treatment Systems, ASME N510-1989, American Society of Mechanical Engineers, 1995.

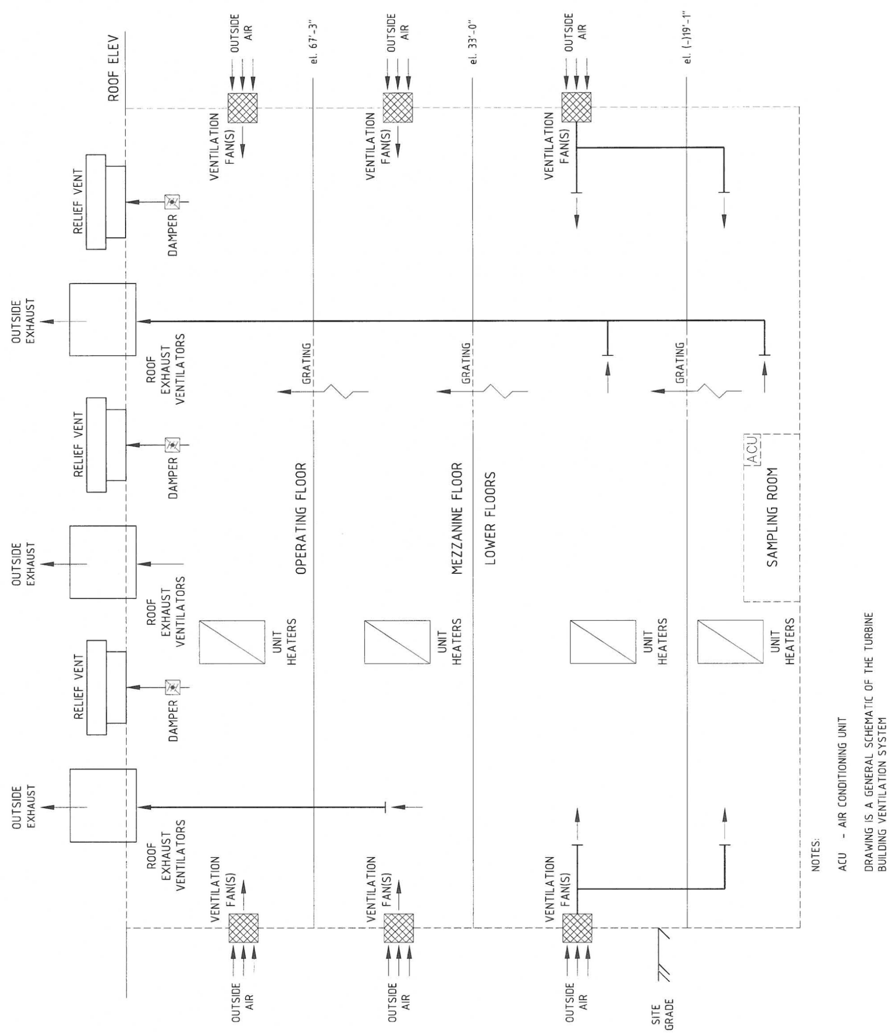
ANSI, 1999. Laboratory Methods of Testing Fans for Aerodynamic Performance Rating, ANSI/ AMCA-210-99, American National Standards Institute/Air Movement and Control Association International, December 1999.

ANSI, 2005a. Certified Ratings Program-Air Performance, ANSI/AMCA-211-05, American National Standards Institute/Air Movement and Control Association International, 2005.

ANSI, 2005b. Reverberant Room Method of Testing Fans for Rating Purposes, ANSI/AMCA-300-05, American National Standards Institute/Air Movement and Control Association International, Inc., 2005.

ANSI, 1995. Laboratory Methods of Testing Fans for Rating Purposes, ANSI/AMCA 500-L, American National Standards Institute/Air Movement and Control Association International, Inc., 1995.}

Figure 9.4-1— Turbine Building Ventilation System



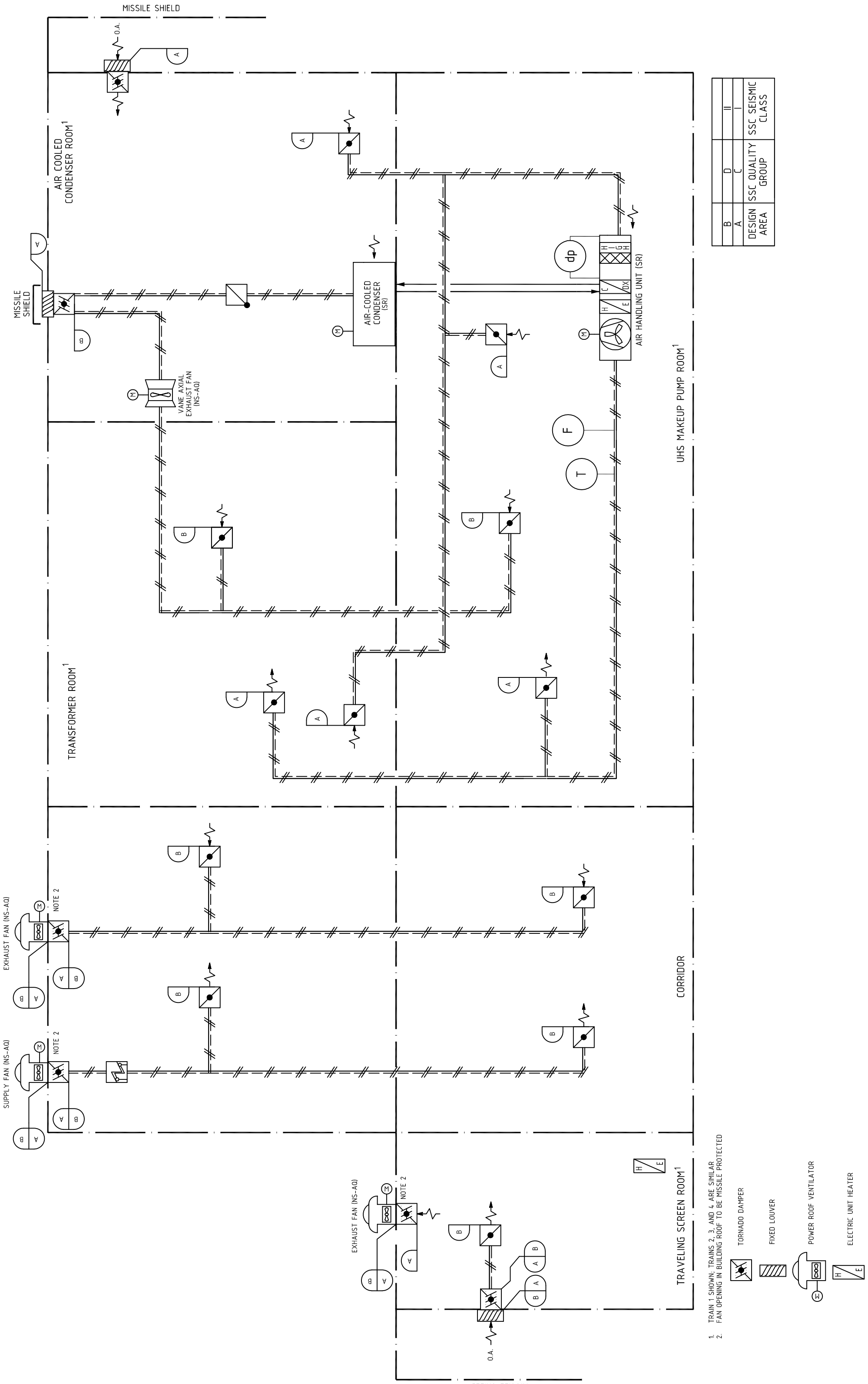


Figure 9.4-2— {UHS Makeup Water Intake Structure Ventilation System}

9.5 OTHER AUXILIARY SYSTEMS

This section of the U.S. EPR FSAR is incorporated by reference with the following supplements.

9.5.1 Fire Protection System

No departures or supplements.

9.5.1.1 Design Basis

Appendix 9B of this COL FSAR supplements Appendix 9A of the U.S. EPR FSAR.

9.5.1.2 System Description

9.5.1.2.1 General Description

For all aspects of the site specific Fire Protection Program (FPP), the same codes and standards and applicable edition years apply for fire protection as listed in Section 9.5.1.7 of the U.S. EPR FSAR.

Table 9.5-1 provides supplemental information for select items/statements in U.S. EPR FSAR Table 9.5-1 identified as requiring COL Applicant input. The supplemental information is in a column headed {"CCNPP Unit 3 Supplement"} and addresses {CCNPP Unit 3} conformance to the identified requirement of Regulatory Guide 1.189 (NRC, 2007).

{Figure 9.5-2 and Figure 9.5-3 each provide a schematic piping and instrumentation diagram of the fire water distribution system specific to CCNPP Unit 3. These figures supplement the generic piping and instrumentation diagram provided in Figure 9.5-1 of the U.S. EPR FSAR.}

The U.S. EPR includes the following COL item in Section 9.5.1.2.1:

> A COL applicant that references the U.S. EPR design certification will provide a description and simplified Fire Protection System piping and instrumentation diagrams for site-specific systems.

This COL item is addressed as follows:

> {Figure 9.5-2 and Figure 9.5-3 each provide a schematic piping and instrumentation diagram of the fire water distribution system specific to CCNPP Unit 3. These figures supplement the generic piping and instrumentation diagram provided in Figure 9.5-1 of the U.S. EPR FSAR.
>
> Figure 9.5-2 illustrates the site-specific fire main yard loop supplying the Cooling Tower area. This non-seismic loop supplies the sprinkler system protecting the Water Treatment Building as well as the yard fire hydrants.
>
> Figure 9.5-3 illustrates the site-specific fire main yard loop supplying the Intake Structure area. The Seismic Category II-SSE loop supplies fire water to the above ground manual and automatic suppression systems identified in Figure 9.5-3. This figure illustrates the Seismic Category II-SSE standpipe and hose stations and the Seismic Category II sprinkler systems specified for the UHS Makeup Water Intake Structure.}

Plant Fire Prevention and Control Features

Plant Arrangement

{The site building layout is shown in Figure 2.1-1. An enlargement of the power block area is provided in Figure 2.1-5.} Details of the arrangement of the Turbine Building, Switchgear Building, Auxiliary Power Transformer Area, Generator Transformer Area (the remaining power block structures) and non-power block structures are provided in Appendix 9B of this COL application.

Architectural and Structural Features

The U.S. EPR includes the following COL item in Section 9.5.1.2.1:

> A COL applicant that references the U.S. EPR design certification will submit site-specific information to address the Regulatory Guide 1.189, Regulatory Position C.6.2.6, Cooling Towers.

This COL item is addressed as follows:

> {The CWCT is remotely located such that a fire will not adversely affect any systems or equipment important to safety (refer to Figure 1.1-3).
>
> Fire protection features provided to protect the CWCT include a dedicated, underground, fire protection yard loop which surrounds the CWCT, and supplies yard hydrants located in accordance with NFPA 24. The CWCT yard loop is supplied from two independent supply lines from the main fire water distribution system underground yard loop. Other fire protection features provided include automatic fire detection, manual fire alarms and portable fire extinguishers.}

Electrical System Design and Electrical Separation

Details of the electrical system design/separation for the remainder of the power block and balance of plant structures/areas are provided in Appendix 9B of this COL application.

Fire Safe Shutdown Capability

The U.S. EPR FSAR includes the following COL Item in Section 9.5.1.2.1:

> A COL applicant that references the U.S. EPR design certification will perform an as-built, post-fire Safe Shutdown Analysis, which includes final plant cable routing, fire barrier ratings, purchased equipment, equipment arrangement and includes a review against the assumptions and requirements contained in the Fire Protection Analysis. The post-fire Safe Shutdown Analysis will demonstrate that safe shutdown performance objectives are met prior to fuel loading and will include a post-fire safe shutdown circuit analysis based on the methodology described in NEI 00-01, "Guidance for Post-Fire Safe-Shutdown Circuit Analysis."

This COL Item is addressed as follows:

{Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC} shall perform an as-built, post-fire Safe Shutdown Analysis, including final plant cable routing, fire barrier ratings, purchased equipment, equipment arrangement and a review against the assumptions and requirements contained in the Fire Protection Analysis. The post-fire Safe Shutdown

Analysis will demonstrate that safe shutdown performance objectives are met prior to fuel loading and will include a post-fire safe shutdown circuit analysis based on the methodology described in NEI 00-01 (NEI, 2001).

The remainder of the plant is separated from portions of the facility containing fire safe shutdown systems or components by appropriately rated fire barriers and/or distance in accordance with RG 1.189 (NRC, 2007). These remaining areas do not contain fire safe shutdown systems or components. This is detailed in Appendix 9B of this COL application.

Communications

No departures or supplements.

Emergency Lighting

No departures or supplements.

Ventilation System Design Considerations

Details of the ventilation system for the remainder of the power block and balance of plant structures are provided in Appendix 9B of this COL application.

Control of Smoke, Hot gases, and Fire Suppressant

Smoke confinement/smoke control is not provided in other structures/areas of the plant.

Fire Detection and Alarm System

Details of the fire detection and alarm system for the remainder of the power block and balance of plant structures are provided in Appendix 9B of this COL application.

Fire Water Supply System

The U.S. EPR includes the following COL item in Section 9.5.1.2.1:

> A COL applicant that references the U.S. EPR design certification will describe the program used to monitor and maintain an acceptable level of quality in the fire protection system freshwater storage tanks.

This COL item is addressed as follows:

The fire protection water supply quality program will ensure the criteria in Regulatory Guide 1.189, Section 3.2.1, are met as follows:

{Suction storage tank makeup is supplied from the desalinization plant which ultimately draws suction from the Chesapeake Bay. The fire protection water supply is treated to potable quality to help prevent occurrence of biological fouling or corrosion by means of desalination and chemical treatment.} The rate of makeup flow to the fire water storage tanks is sufficient to refill the minimum fire protection volume in one tank within eight hours. In addition to water treatment, the fire water storage tanks are inspected periodically for biological growth and subsequent corrosion; fire service mains, fire hydrants and fire suppression systems are also flow tested and/or drained periodically to verify treatment success and to confirm system functionality. The rate of makeup flow to the fire water storage tanks is sufficient to refill the minimum fire protection volume in one tank within eight hours.

In addition, the highest sprinkler system demand is for the Turbine Building and is {2400 gpm at 161 psig}. The highest standpipe system demand is for the Containment Building and is {1250 gpm at 176 psig}.

Automatic Fire Suppression Systems

Details of the automatic fire suppression systems for the remainder of the power block and balance of plant structures are provided in Appendix 9B of this COL application.

In addition, automatic sprinkler systems, designed and installed in accordance with National Fire Protection Association (NFPA) 13 (NFPA, 2007b), are provided for the following buildings:

- {Turbine Building under operating deck and skirt areas
- SBO Diesel Tank Rooms
- SBO Auxiliary Equipment Rooms
- Switchgear Building Diesel Engine Rooms
- Auxiliary Boiler Equipment Room
- Warehouse Building
- Central Gas Supply Building
- Fire Protection Building
- Desalinization / Water Treatment Building}

Automatic single or double interlock preaction sprinkler systems designed and installed in accordance with NFPA 13 (NFPA, 2007b) are provided in the following areas:

- Turbine Generator and Exciter bearings
- Switchgear Building Cable Spreading Rooms
- Switchgear Building Low- and Medium-Voltage Distribution Board Rooms
- Switchgear Building Cable Distribution Division Rooms
- Switchgear Building Battery Rooms
- Switchgear Building Battery Charger Rooms
- Switchgear Building I&C Control / Protection Panel Rooms

Fixed deluge water spray systems designed and installed in accordance with NFPA 15 are provided for the following hazards.

- Hydrogen seal oil unit
- Turbine Building Lube oil drain trenches

- Auxiliary Power Transformers
- Generator Transformers

Manual Fire Suppression Systems

Details of the manual fire suppression systems for the remainder of the power block and balance of plant structures are provided in Appendix 9B of this COL application.

9.5.1.3 Safety Evaluation – Fire Protection Analysis

The U.S. EPR FSAR includes the following COL Item in Section 9.5.1.3:

> A COL applicant that references the U.S. EPR design certification will evaluate the differences between the as-designed and as-built plant configuration to confirm the Fire Protection Analysis remains bounding. This evaluation will be performed prior to fuel loading and will consider the final plant cable routing, fire barrier ratings, combustible loading, ignition sources, purchased equipment, equipment arrangement and includes a review against the assumptions and requirements contained in the Fire Protection Analysis. The applicant will describe how this as-built evaluation will be performed and documented, and how the NRC will be made aware of deviations from the FSAR, if any.

This COL Item is addressed as follows:

{Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC} shall evaluate the differences between the as-designed and as-built plant configuration to confirm the Fire Protection Analysis remains bounding. This evaluation will consider the final plant cable routing, fire barrier ratings, combustible loading, ignition sources, purchased equipment, equipment arrangement and includes a review against the assumptions and requirements contained in the Fire Protection Analysis. A summary of the results of the evaluation, including any identified deviations from the FSAR and confirmation that the Fire Protection Analysis remains bounding, will be provided prior to fuel load.

The U.S. EPR includes the following COL item in Section 9.5.1.3:

> A COL applicant that references the U.S. EPR design certification will perform a supplemental Fire Protection Analysis for site-specific areas of the plant not analyzed by the FSAR.

This COL item is addressed as follows:

Appendix 9B addresses the fire protection analysis for the remaining power block and balance of plant structures.

In addition, the plant will maintain an integrated fire hazards analysis (FHA) and supporting evaluations that demonstrate that the plant can:

- achieve and maintain post-fire safe shutdown conditions for a fire in any fire area of the plant, including alternative shutdown fire areas,
- maintain safe plant conditions and minimize potential release of radioactive material in the event of a fire during any plant operating mode,

- detail the plant fire prevention, detection, suppression, and containment features, for each fire area containing structures, systems and components (SSCs) important to safety, and
- achieve and maintain these safe conditions with due consideration of plant fire risk as characterized in the plant-specific fire probabilistic risk assessment (Fire PRA).

9.5.1.4 Inspection and Testing Requirements

The FPP includes procedures for testing fire protection features and systems and includes criteria to ensure design and system readiness. This includes installation and acceptance testing, periodic testing, quality assurance oversight of testing, and proper test documentation.

All fire protection features and systems will be surveilled, inspected, tested, and maintained in accordance with applicable codes and standards of the NFPA including start-up and acceptance tests. The frequency of follow-up inspections and tests will also follow NFPA requirements and ALARA guidelines.

All surveillance, inspection, testing and maintenance is conducted and documented in accordance with approved plant procedures and is performed by qualified personnel.

9.5.1.5 Fire Probabilistic Risk Assessment

No departures or supplements.

9.5.1.6 Fire Protection Program

No departures or supplements.

9.5.1.6.1 Fire Prevention

Governance and control of FPP attributes is provided through policies, procedures, and the Quality Assurance Program Description. Procedures are in place for FPP impacting activities including:

- In-situ and transient combustibles.
- Ignition sources.
- Hot Work.
- Annunciator response and pre-fire plans.
- Surveillance, inspection, testing, and maintenance (as applicable) of:
    - Passive fire barriers including opening protectives (i.e., fire doors, fire dampers, and through penetration seal systems).
    - Fire protection water supply system.
    - Automatic and manual fire suppression systems and equipment.
    - Automatic and manual fire detection/fire alarm system equipment.
    - Fire brigade and fire response equipment.

9.5.1.6.2 Fire Protection Program

{U.S. EPR FSAR Section 9.5.1.6.2 states that the COL applicant is responsible for determining the individual position responsibilities for the organizational functions described herein. CCNPP Unit 3 will utilize the following site-specific titles for the positions identified in U.S. EPR FSAR Section 9.5.1.6.2:

U.S. EPR FSAR Organizational positions	*CCNPP Unit 3 Site specific titles*
Upper level manager	Site Vice President (Section 13.1.2.2.1)
Additional managers	General Supervisor – Operations Support (Section 13.1.2.2.1.1.1.2) General Supervisor – Engineering Support (Section 13.1.2.2.1.2.2)
Onsite manager	Plant General Manager (Section 13.1.2.2.1.1)
Fire protection engineer	Fire Protection Engineer
Nuclear training manager	Manager of Training and Performance Improvement (Section 13.1.2.2.1.3)
Onsite individual responsible for fire protection QA	Site Director – Quality and Performance Improvement (Section 13.1.2.2.1.4)

The Fire Marshall has responsibility to implement the day-to-day requirements of the Fire Protection Program. This position reports to the Plant General Manager and assists the Fire Protection Engineer, General Supervisor – Engineering Support, and the General Supervisor – Operations Support in administrating and implementing the Fire Protection Program through procedures, training, inspections, testing and evaluations.

The UniStar Nuclear Operating Services, LLC site organizational structure is represented in Figure 13.1-4. The site specific management positions for the FPP identified above are included in Figure 13.1-4.}

9.5.1.6.3 Fire Protection Training and Personnel Qualifications

Fire Protection Engineer

No departures or supplements.

Fire Brigade Members

No departures or supplements.

Fire Protection System Operation, Testing, and Maintenance

Personnel who perform operation of or surveillance, inspection, test, and/or maintenance activities on fire-protection related structures, systems, or components are trained in the specific activities they are required to perform. Training is conducted through one or more of the following: factory or shop training on individual equipment, recognized apprentice and/or journeyman training courses, training coursework on equipment of similar type or experience-based training and qualification on fire systems in general. All personnel who perform fire protection related maintenance will be trained in conformance to plant procedures and in fire protection feature/system impairment procedures.

Training of the Fire Brigade

No departures or supplements.

General Employee Training

This training is required for all personnel who are granted unescorted plant access. General employee training curriculum provides an overview of the requirements of the FPP including: general fire hazards within the plant, the defense-in-depth objectives of the FPP, and an introduction to the FPP procedures that govern employee actions including appropriate steps to be taken upon discovering a significant fire hazard, actions to be taken upon discovering a fire or hearing/seeing a fire alarm, and combustible material and ignition source controls.

Fire Watch Training

Fire Watch – Hot Work

This training is required for all plant and/or contract personnel assigned duties as a fire watch for hot work. Hot work fire watch training provides instruction on fire watch duties and responsibilies, including the identification of conditions or activites that present potential fire hazards, as well as the use of fire extinguishers, including hands-on training on a practice fire with the extinguishing equipment to be used while on fire watch, and the proper fire notification procedures, and required actions for both one-hour roving and continuous fire watches. It also includes instruction on responsibilites, actions, and recordkeeping requirements, the identification of conditions or activities that present potential fire hazards, as well as the use of fire extinguishers, including hands-on training on a practice fire with the extinguishing equipment to be used while on fire watch, and the proper fire notification procedures when serving as a compensatory measure for a degraded fire protection feature. All hot work fire watches are trained in the selection, limitations, and use/application of hand portable fire extinguishers.

Fire Watch – Compensatory Measures

This training is required for all plant and/or contract personnel assigned duties as either a one-hour roving or continuous fire watch compensating for the inoperability or impairment of a given fire protection system or feature. Compensatory measure fire watch training includes instruction on responsibilites, actions, and recordkeeping requirements, the identification of conditions or activities that present potential fire hazards, as well as the use of fire extinguishers, including hands-on training on a practice fire with the extinguishing equipment to be used while on fire watch, and the proper fire notification procedures, when serving as a compensatory measure for a degraded fire protection feature. All compensatory measure fire watches are trained in the selection, limitations, and use/application of hand portable fire extinguishers.

9.5.1.6.4 Fire Brigade Organization, Training, and Records

Fire Brigade equipment including personal protective equipment for structural firefighting is provided for the plant fire brigade. Each fire brigade member is equipped with a helmet (with face shield), turnout coat, turnout pants, footwear, gloves, protective hood, personal alert safety system (PASS) device, and self-contained breathing apparatus (SCBA). All equipment will conform to appropriate NFPA standards. The plant maintains an adequate inventory of firefighting equipment to ensure outfitting of a full complement of brigade members with consideration of the possibility of sustained fire response operations (multiple crews).

SCBAs are required to be worn for interior fire response activities and at similar times when fire/response activities may involve a risk of chemical, particulate, and/or radiological material inhalation exposure.

Other types of fire response equipment are distributed and/or cached at various locations throughout the plant to support response by the plant fire brigade and/or off-site response agencies. The types of equipment provided include fire hose (2-1/2 and 1-1/2 inch diameter), combination and specialty hose nozzles, portable smoke removal equipment, spill control and absorbent materials, supplemental hand portable fire extinguishers, aqueous film-forming foam (AFFF) supply and foam eductors, and other specialty tools.

The plant has procedural controls in place to govern the response to fires. This includes fire annunciator response procedures and pre-fire plans which provide direction for the Control Room to determine: the need to initiate plant safe shutdown, the actions to take to effect shutdown, the mobilization and response of Control Room operators, and the mobilization and response of the plant Fire Brigade to effect fire-fighting activities. These procedures are utilized, in conjunction with the Emergency Plan, to determine when conditions necessitate:

- Requesting support of off-site emergency response resources.
- The declaration and escalation of the fire occurrence as a plant emergency.
- The notification of local, state, and federal governmental agencies.

9.5.1.6.5 Quality Assurance

This section of the U.S. EPR FSAR is incorporated by reference with the following supplemental information.

Section 9 .5.1.6.5 of the U.S. EPR FSAR refers to U.S. EPR FSAR, Section 17.2 and its requirement that the COL applicant provide the Quality Assurance Programs associated with the construction and operations phase, which should include a description of the fire protection system quality assurance program to be applied during fabrication , erection, installation and operations.

The Quality Assurance Program Description has appropriate provisions to govern the quality attributes of the FPP. The FPP conforms to the applicable provisions of 10 CFR 50, Appendix B (CFR, 2008) and with the quality assurance guidance in Regulatory Guide 1.189 (NRC, 2007).

Audits of the FPP will be performed at the recommended frequencies by an audit team staffed and led by qualified QA and technical auditors.

Additional details of the quality assurance program are provided in Section 17.5.

9.5.1.7 References

{**CFR, 2008.** 10 CFR Appendix B.

NEI, 2001. NEI 00-01, Revision 1, "Guidance for Post-Fire Safe Shutdown Circuit Analysis," Nuclear Energy Institute, 2001.

NFPA, 2007a. Standard for Water Spray Fixed Systems for Fire Protection, NFPA 15, National Fire Protection Association, 2007.

NFPA, 2007b. Standard for the Installation of Sprinkler Systems, NFPA 13, National Fire Protection Association, 2007.

NRC, 2007. Fire Protection for Nuclear Power Plants, Revision 1, Regulatory Guide 1.189, Revision 1, U. S. Nuclear Regulatory Commission, March 2007.}

9.5.2 Communication System

No departures or supplements.

9.5.2.1 Design Basis

This section of the U.S. EPR FSAR is incorporated by reference with supplements as identified in the following section.

9.5.2.1.1 10 CFR 50 Appendix E, Emergency Planning and Preparedness for Production and Utilization Facilities

The U. S. EPR FSAR includes the following COL Item in Section 9.5.2.1.1:

> A COL applicant that references the U.S. EPR design certification will provide a description of the offsite communication system that interfaces with the onsite communication system, including type of connectivity, radio frequency, normal and backup power supplies, and plant security system interface.

This COL item is addressed as follows:

{The emergency off-site communication system provides interface between the on-site and off-site communication systems to allow dedicated communication access to EOF, NRC, and federal and state/local agencies. This system is designed to be compatible with on-site communication systems. The emergency off-site communication system is powered from a Class 1E UPS system. Any interfaces to the plant security system are addressed in the Physical Security Plan. The design ensures frequency compatibility between the COL applicant systems and non COL applicant controlled communication networks. The Emergency Notification System (ENS) is powered locally from either a safety-related or non safety-related power source with a UPS, having either battery or generator backup. The ENS is routed through the site PBX to provide access to multiple outbound call paths. The long distance portion of the system is provided by the NRC using direct access lines (DALs) to the federal long distance service directed through a toll-free (800/888) exchange.}

9.5.2.1.2 10 CFR 50.34 (f)(2)(xxv), Emergency Response Facilities

No departures or supplements.

9.5.2.1.3 10 CFR 50.47(b)(8), Equipment and Facilities to Support Emergency

No departures or supplements.

9.5.2.1.4 10 CFR 50.55 (a), Codes and Standards

No departures or supplements.

9.5.2.1.5 10 CFR 50 Appendix A - General Design Criteria

No departures or supplements.

9.5.2.1.6 10 CFR 73.45(e)(2)(iii), Performance Capabilities for Fixed Site Physical Protection Systems - Communications Subsystems, and 10 CFR 73.45(g)(4)(i), Provide Communications Networks

No departures or supplements.

9.5.2.1.7 10 CFR 73.55(e), Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors Against Radiological Sabotage Detection Aids, 10 CFR 73.55(f), Communications Subsystems, and 10 CFR 73.46(f), Fixed site Physical Protection Systems, Subsystems, Components and Procedures - Communications Subsystems

No departures or supplements.

9.5.2.2 System Description

No departures or supplements.

9.5.2.3 System Operation Communications Stations

The U. S. EPR FSAR includes the following COL Item in Section 9.5.2.3:

> The COL applicant referencing the U.S. EPR certified design will identify additional site-specific communication locations necessary to support effective communication between plant personnel in all vital areas of the plant during normal operation, as well as during accident conditions.

This COL Item is addressed as follows:

{The UHS Makeup Water Intake Structure contains safety-related equipment and is a site-specific vital area of the plant. Communication equipment will be provided in this area to support effective communication between plant personnel during normal operation, as well as during accident conditions. This location will contain equipment to allow use of the plant digital telephone system, PA and alarm system, and sound powered system. A portable wireless communication system will also be provided for use by fire brigade and other operations personnel required to achieve safe plant shutdown.

All the communication subsystems are available for use during normal operation of the plant. Except for the sound-powered system, the communication subsystems are powered from the Class 1E Emergency Uninterruptible Power Supply System (EUPS) or the Class 1E Emergency Power Supply System (EPSS), which are supported by the emergency and station blackout diesel generators to provide backup power. Hence all the communication subsystems are expected to be available for use during all accident conditions. However, all communications equipment is categorized as non-safety related, and is not relied upon to mitigate an accident. The sound-powered system does not require an external power source.}

9.5.2.4 Inspection and Testing Requirements

No departures or supplements.

9.5.2.5 References

No departures or supplements.

9.5.3 Lighting System

No departures or supplements.

9.5.4 Diesel Generator Fuel Oil Storage and Transfer System

9.5.4.1 Design Basis

No departures or supplements.

9.5.4.2 System Description

No departures or supplements.

9.5.4.3 System Operation

No departures or supplements.

9.5.4.4 Safety Evaluation

The U.S. EPR includes the following COL item in Section 9.5.4.4:

> A COL applicant that references the U.S. EPR design certification will describe the site-specific sources of acceptable fuel oil available for refilling the EDG fuel oil storage tanks within seven days, including the means of transporting and refilling the fuel storage tanks, following a design basis event to enable each diesel generator system to supply uninterrupted emergency power.

This COL item is addressed as follows:

> {Calvert Cliffs 3 Nuclear Project, LLC and UniStar Nuclear Operating Services, LLC}

9.5.4.5 Inspection and Testing Requirements

No departures or supplements.

9.5.4.6 Instrumentation Requirements

No departures or supplements.

9.5.4.7 References

No departures or supplements.

9.5.5 Diesel Generator Cooling Water System

No departures or supplements.

9.5.6 Diesel Generator Starting Air System

No departures or supplements.

9.5.7 Diesel Generator Lubricating System

No departures or supplements.

9.5.8 Diesel Generator Air Intake and Exhaust System

No departures or supplements.

Table 9.5-1— {Fire Protection Program Compliance with Regulatory Guide 1.189}
(Page 1 of 8)

R.G. Section	Regulatory Guide 1.189 "C. Regulatory Position"[1]	Compliance[2]	U.S. EPR Comment	CCNPP Unit 3 Supplement
C.1	Fire Protection Program	Compliance		The Fire Protection Program (FPP) is consistent with the requirements of Regulatory Guide 1.189 and SRP 9.5-1. Details of the FPP are provided in this COL application.
C.1.1	Organization, Staffing, and Responsibilities	Compliance		The Unistar Nuclear Operating SErvices, LLC site organizational structure is represented in Figure 13.1-4. The key site specific positions for the FPP are identified in Section 9.5.1.6.2
C.1.2	Fire Hazards Analysis	Compliance	See Fire Protection Analysis Appendix 9A	Appendix 9A of the U.S. EPR FSAR provides the technical analysis for the nuclear island and demonstrates that the EPR has the ability to achieve and maintain safe-shutdown and to minimize the release of radioactive materials to the environment. Appendix 9B is an analysis detailing fire hazards and fire protection attributes for the remainder of the plant. Other structures not listed will be confirmed as not posing fire/explosion risk to the plant using NFPA 80A criteria.
C1.3	Safe Shutdown Analysis	Compliance		The plant will develop and maintain an integrated, detailed site-specific FHA and will have detailed procedures and training to ensure fire-safe shutdown and other fire safe conditions required to minimize radioactive material release are achieved and maintained.
C.1.4	Fire Test Reports and Fire Data	Compliance		If untested barrier configurations are determined necessary during detailed design, they will be evaluated consistent with RG 1.189 requirements.
C.1.5	Compensatory Measures	Compliance		The FPP will apply compensatory measures consistent with RG 1.189 recommendations and standard industry practice whenever fire protection features are degraded and/or inoperable. Compensatory measures will be applied when necessary to accomplish repair or modification or as a result of findings during inspection or surveillance. Fire watches, temporary fire barriers, or backup suppression capability will be implemented, as applicable. Where an uncommon type of compensatory measure is warranted, an evaluation of the alternative will be conducted prior to implementation. Such evaluation will incorporate fire risk insights as applicable.
C.1.6	Fire Protection Training and Qualifications	Compliance		The FPP organization is shown in Section 9.5.1.6.2. The training and qualifications are detailed in Section 9.5.1.6.3.
C.1.6.1	Fire Protection Staff Training and Qualifications	Compliance		The responsibilities, lines of authority, training and qualifications by title/position are detailed in administrative procedures and the UniStar Nuclear Quality Assurance Program Description.

Table 9.5-1— {Fire Protection Program Compliance with Regulatory Guide 1.189}
(Page 2 of 8)

R.G. Section	Regulatory Guide 1.189 "C. Regulatory Position"[1]	Compliance[2]	U.S. EPR Comment	CCNPP Unit 3 Supplement
C.1.6.2	General Employee Training	Compliance		General employee training includes instruction on actions to take upon discovery of a fire, hearing a fire alarm, and proper fire preventative and protective administrative controls and actions.
C.1.6.3	Fire Watch Training	Compliance		Fire watch training includes instruction on responsibilities, actions, and records for oversight of hot work and when serving as compensatory measure for degraded fire protection feature.
C.1.6.4	Fire Brigade Training and Qualifications	Compliance		The fire brigade will have at least five members available on each shift above the minimum shift complement for safe operation/shutdown. The brigade is trained and equipped to respond to fire-related emergencies.
C.1.6.4.1	Qualifications	Compliance		The fire brigade will be under the direction of the Shift Manager. A Fire Brigade Leader is assigned and qualified to command response to fire emergencies. A minimum of three operations staff members including one licensed operator will be assigned to the shift fire brigade. Fire brigade members are required to be physically fit and undergo an annual physical examination for initial and continuing brigade membership.
C.1.6.4.2	Instruction	Compliance		Fire brigade members are trained in nuclear facility fire response strategy and tactics by qualified trainers using both classroom and hands-on instruction. The training curriculum is detailed in an administrative procedure. Refresher training is structured to ensure that the entire curriculum is repeated every two years.
C.1.6.4.3	Fire Brigade Practice	Compliance		Brigade practice sessions are scheduled to ensure that each member attends at least one session per year.
C.1.6.4.4	Fire Brigade Training Records	Compliance		Brigade training records will be retained for a minimum of three years.
C.1.7	Quality Assurance	Compliance		The UniStar Nuclear Energy Quality Assurance Program Description has appropriate provisions to govern the quality attributes of the fire protection program. The FPP conforms to the applicable provisions of 10 CFR 50, Appendix B and with the quality assurance guidance in RG 1.189.

Table 9.5-1— {Fire Protection Program Compliance with Regulatory Guide 1.189}
(Page 3 of 8)

R.G. Section	Regulatory Guide 1.189 "C. Regulatory Position"[1]	Compliance[2]	U.S. EPR Comment	CCNPP Unit 3 Supplement
C.1.7.1	Design and Procurement Document Control	COL Applicant	Note 3	Design and Procurement Document Control shall be in accordance with the Quality Assurance Program Description. Fire protection quality requirements are included in plant configuration control processes.
C.1.7.2	Instructions, Procedures, and Drawings	COL Applicant	Note 3	The FPP provides instruction and procedures to control fire prevention and firefighting; design, installation, inspection, test, maintenance and modification of fire protection features/systems; and appropriate administrative controls in accordance with the Quality Assurance Program Description.
C.1.7.3	Control of Purchased Material, Equipment, and Services	COL Applicant	Note 3	The FPP provides procedures to control procurement of fire protection related items to ensure proper evidence of quality in accordance with of the Quality Assurance Program Description.
C.1.7.4	Inspection	Compliance		The FPP includes procedures for independent inspection of fire protection-related activities including installation and/or maintenance of features including FP systems, emergency lighting and communication, cable routing, and fire barriers and opening protectives in accordance with of the Quality Assurance Program Description.
C.1.7.5	Test and Test Control	Compliance		The FPP includes procedures for testing fire protection features and systems and includes criteria to ensure design and system readiness. This includes installation and acceptance testing, periodic testing, quality assurance oversight of testing, and proper test documentation in accordance with the Quality Assurance Program Description.
C.1.7.6	Inspection, Test, and Operating Status	Compliance		Fire protection features and systems are provided with suitable marking and labeling to indicate acceptance and readiness for operation in accordance with the Quality Assurance Program Description.
C.1.7.7	Non-conforming Items	Compliance		The FPP includes procedures for identification and control of items that do not conform to specified requirements, are inoperable or otherwise unsuitable. This includes tagging or labeling, notification and dispositioning of the nonconforming item in accordance with of the Quality Assurance Program Description.
C.1.7.8	Corrective Action	Compliance		The plant has an administrative procedure to ensure that proper corrective actions are taken for conditions adverse to fire protection including root cause analysis when appropriate in accordance with the Quality Assurance Program Description.

Table 9.5-1— {Fire Protection Program Compliance with Regulatory Guide 1.189}
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R.G. Section	Regulatory Guide 1.189 "C. Regulatory Position"[1]	Compliance[2]	U.S. EPR Comment	CCNPP Unit 3 Supplement
C.1.7.9	Records	Compliance		The FPP includes provisions for preparing and maintaining retrievable records that demonstrate conformance to fire protection requirements in accordance with the Quality Assurance Program Description.
C.1.7.10	Audits	Compliance		The FPP requires that audits be performed at the appropriate periodicity by qualified fire protection and QA personnel to verify that the program is being properly implemented and that compliance to fire protection requirements is being met in accordance with the Quality Assurance Program Description.
C.1.7.10.1	Annual Fire Protection Audit	Compliance		An annual audit will be performed consistent with R.G. 1.189.
C.1.7.10.2	24-Month Fire Protection Audit	Compliance		A biennial audit will be performed consistent with R.G. 1.189 and the Quality Assurance Program Description.
C.1.7.10.3	Triennial Fire Protection Audit	Compliance		A triennial audit will be performed consistent with R.G. 1.189 and the Quality Assurance Program Description. Independent auditors will be used to perform triennial audits.
C.1.8	Fire Protection Program Changes/ Code Deviations	COL Applicant	Note 3	FPP changes or deviations will be assessed in accordance with existing regulatory guidance (i.e., NUREG-0800, SRP 9.5.1 and R.G. 1.189). In the future if the NRC endorses a risk-informed, performance-based (RI/PB) plant change evaluation process for new reactors, similar to that under development by the NFPA Technical Committee on Fire Protection for Nuclear Facilities, UniStar Nuclear Energy may opt to adopt such a process to augment the existing regulatory guidance for assessing program changes or deviations. If a RI/PB change evaluation process were to be adopted in the future, it would be implemented and maintained as part of an administratively controlled plant change control process and designed in accordance with NRC endorsed methodology. Any adoption of RI/PB evaluation methodology to plant change control processes would be submitted to NRC for approval prior to use by UniStar Nuclear Energy.
C.1.8.1	Change Evaluations	COL Applicant	Note 3	Compliance - FPP program changes will be evaluated consistent with 10 CFR 50.59 and the applicable change processes in 10 CFR 52.
C.1.8.5	10 CFR 50.72 Notification and 10 CFR 50.73 Report	COL Applicant	Note 3	Compliance - the plant will report fire events and any fire protection program deficiencies consistent with 10 CFR 50.72 and 10 CFR 50.73.

Table 9.5-1— {Fire Protection Program Compliance with Regulatory Guide 1.189}
(Page 5 of 8)

R.G. Section	Regulatory Guide 1.189 "C. Regulatory Position"[1]	Compliance[2]	U.S. EPR Comment	CCNPP Unit 3 Supplement
C.1.8.7	Fire Modeling	COL Applicant	Note 3	Compliance - If fire models are used to evaluate changes, the plant will apply models consistent with R.G. 1.189 including limitations on their use and adequate verification and validation (as required).
C.2	Fire Prevention	Compliance		The FPP includes procedures to ensure minimization of fire hazards in areas important to safety for anticipated operating conditions and to ensure fire safety as part of facility modifications.
C.2.1	Control of Combustibles	Compliance		The FPP includes procedures to control transient combustibles consistent with the Fire Hazards Analysis and good fire prevention practices.
C.2.1.1	Transient Fire Hazards	Compliance		The FPP includes procedures to control transient combustibles consistent with the Fire Hazards Analysis and good fire prevention practices.
C.2.1.2	Modifications	Compliance		The FPP includes procedures to ensure that fire prevention and fire safety practices are maintained and that the facility fire safety design basis is not negatively impacted.
C.2.1.3	Flammable and Combustible Liquids and Gases	Compliance		The FPP includes procedures to ensure flammable and combustible liquids and gases are handled properly and consistent with the facility design basis.
C.2.1.4	External/Exposure Fire Hazards	Compliance		The FPP includes procedures to ensure that any adjacent or external facilities to areas important to safety are evaluated consistent with NFPA 80A and for impact on the facility Fire Hazards Analysis.
C.2.2	Control of Ignition Sources	Compliance		The FPP includes procedures for control of ignition sources. The facility design follows recognized codes, standards, and practices to minimize ignition hazards.
C.2.2.1	Open Flame, Welding, Cutting, and Grinding (Hot Work)	Compliance		The FPP includes procedures for issuance of hot work permits and to control the designation of fixed weld shop areas or similar.
C.2.2.2	Temporary Electrical Installations	Compliance		The FPP includes procedures to monitor and control the use of temporary electrical installations for routine and outage related maintenance consistent with recognized standards and practices.
C.2.2.3	Other Sources	Compliance		The FPP includes procedures to monitor and control other non-routine ignition hazards such as temporary heating, leak testing, tar kettles, heat guns, and similar devices/operations.

Table 9.5-1— {Fire Protection Program Compliance with Regulatory Guide 1.189}
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R.G. Section	Regulatory Guide 1.189 "C. Regulatory Position"[1]	Compliance[2]	U.S. EPR Comment	CCNPP Unit 3 Supplement
C.2.3	Housekeeping	Compliance		The FPP includes procedures for routine housekeeping and monitoring areas important to safety for prompt removal of combustibles.
C.2.4	Fire Protection System Maintenance and Impairments	Compliance		The FPP includes procedures to ensure fire protection features and systems are maintained in accordance with applicable reference standards and other regulatory guidance. Fire system and feature impairments are controlled by a permit system authorized by a qualified individual.
C.3.5	Manual Firefighting Capabilities	Compliance		See below
C.3.5.1	Fire Brigade	Compliance		The Fire Brigade consists of at least five members available on each shift above the minimum shift complement for safe operation/ shutdown. The brigade is trained and equipped to respond to fire-related emergencies.
C.3.5.1.1	Fire Brigade Staffing	Compliance		The Fire Brigade consists of at least five members available on each shift above the minimum shift complement for safe operation/ shutdown. The on-duty Shift Manager is not a member of the fire brigade.
C.3.5.1.2	Equipment	Compliance		The Fire Brigade is suitably outfitted and equipped for interior structural firefighting activities. PPE and related fire brigade equipment conforms with and is maintained per recognized standards. This includes turnout gear and self-contained breathing apparatus and equipment including hoses, nozzles, smoke ejectors, and other specialized equipment. Equipment maintenance and inspection is performed per plant procedure.
C.3.5.1.3	Procedures and Prefire Plans	Compliance		The Fire Brigade and fire response activities are conducted in accordance with annunciator response procedures, pre-fire plans, and related fire response procedures which address strategies and tactics typical to nuclear power plant fire response.
C.3.5.2	Offsite Manual Firefighting Resources	Compliance		Offsite fire department response is governed through a mutual aid agreement with offsite fire departments. The offsite fire departments are included in pertinent training on the hazards of the facility and participate in a minimum of one drill per year on-site.
C.3.5.2.1	Capabilities	Compliance		The offsite fire department equipment is compatible with the plant equipment and/or adapters are provided and available when required.

Table 9.5-1— {Fire Protection Program Compliance with Regulatory Guide 1.189}
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R.G. Section	Regulatory Guide 1.189 "C. Regulatory Position"[1]	Compliance[2]	U.S. EPR Comment	CCNPP Unit 3 Supplement
C.3.5.2.2	Training	Compliance		The offsite fire departments are included in pertinent training on the hazards of and response within the facility including radiological and operational hazards; site access/security; and roles, responsibilities and authorities including command and response structure.
C.3.5.2.3	Agreement/Plant Exercise	Compliance		The plant will establish written mutual aid agreements with off-site fire departments to provide response support to the fire brigade. Said agreements will address authorities and command responsibilities and will provide for periodic participation/joint training including annual drills and participation in radiological emergency response plan exercises.
C.4.1.7	Communications	Compliance		The Fire Brigade will utilize portable radios for communications during fire response. This system is arranged to not conflict with other site radio communications and to provide reliable, comprehensive coverage for the site. The radio system is the primary means of communication for fire brigade operations. Secondary communications are available to the fire brigade via the plant primary and wireless telephone systems and by the plant public address system.
C.5.5	Post-Fire Safe-Shutdown Procedures	COL Applicant	Note 3	Compliance - The plant will have detailed procedures and training to ensure fire-safe shutdown and other fire-safe conditions required to minimize radioactive material release are achieved and maintained.
C.5.5.1	Safe-Shutdown Procedures	COL Applicant	Note 3	Compliance - See C.5.5
C.5.5.2	Alternative/Dedicated Shutdown Procedures	COL Applicant	Note 3	Compliance - See C.5.5
C.5.5.3	Repair Procedures	COL Applicant	Note 3	Compliance - Consistent with the U.S. EPR FSAR, the plant does not permit repairs to achieve hot or cold shutdown conditions; procedures are not required.
C.6.1.6	Alternative/Dedicated Shutdown Panels	Compliance		The FPP includes procedures to control transient combustibles consistent with the Fire Hazards Analysis and good fire prevention practices.
C.6.2.4	Independent Spent Fuel Storage Areas	COL Applicant	Note 3	Compliance – No Independent Spent Fuel Storage Areas are planned for the plant at this time and are not included in this COL application.

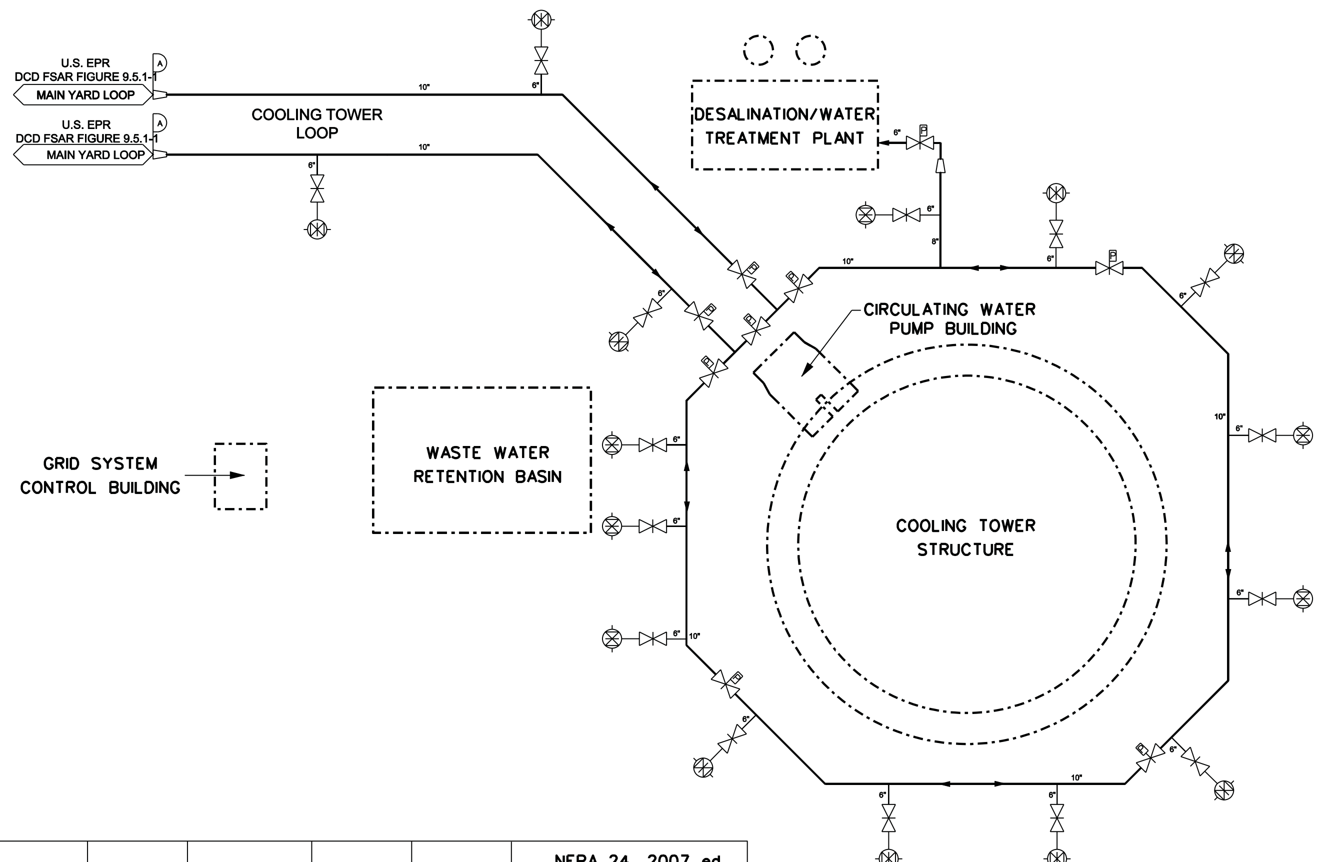
Table 9.5-1— {Fire Protection Program Compliance with Regulatory Guide 1.189}
(Page 8 of 8)

R.G. Section	Regulatory Guide 1.189 "C. Regulatory Position"[1]	Compliance[2]	U.S. EPR Comment	CCNPP Unit 3 Supplement
C.6.2.6	Cooling Towers	COL Applicant for the Circulating Water System Cooling Tower Structure	Note 3 for the Circulating Water System Cooling Tower Structure	Compliance - Circulating Water System. The Cooling Tower Structure is addressed in Appendix 9B.
C.7.6	Nearby Facilities	COL Applicant	Note 3	Compliance - Appendix 9A of the U.S. EPR FSAR provides the technical analysis for the nuclear island and related power block structures and demonstrates that the EPR has the ability to achieve and maintain safe-shutdown and to minimize the release of radioactive materials to the environment. FSAR Appendix 9B of this COL application provides an analysis of fire hazards and details fire protection attributes for the remainder of the plant.
C.8.4	Applicable Industry Codes and Standards	Compliance		The FPP will conform to the codes and standards and applicable edition years listed in Section 9.5.1.7 of the U.S. EPR FSAR.
C.8.6	Fire Protection Program Implementation Schedule	Compliance		The required elements of the FPP are fully operational prior to receipt of new fuel for buildings storing new fuel and adjacent areas that could affect the fuel storage area at the plant. Other required elements of the FPP described in FSAR Section 9.5.1 are fully operational prior to initial fuel loading at.

Notes:

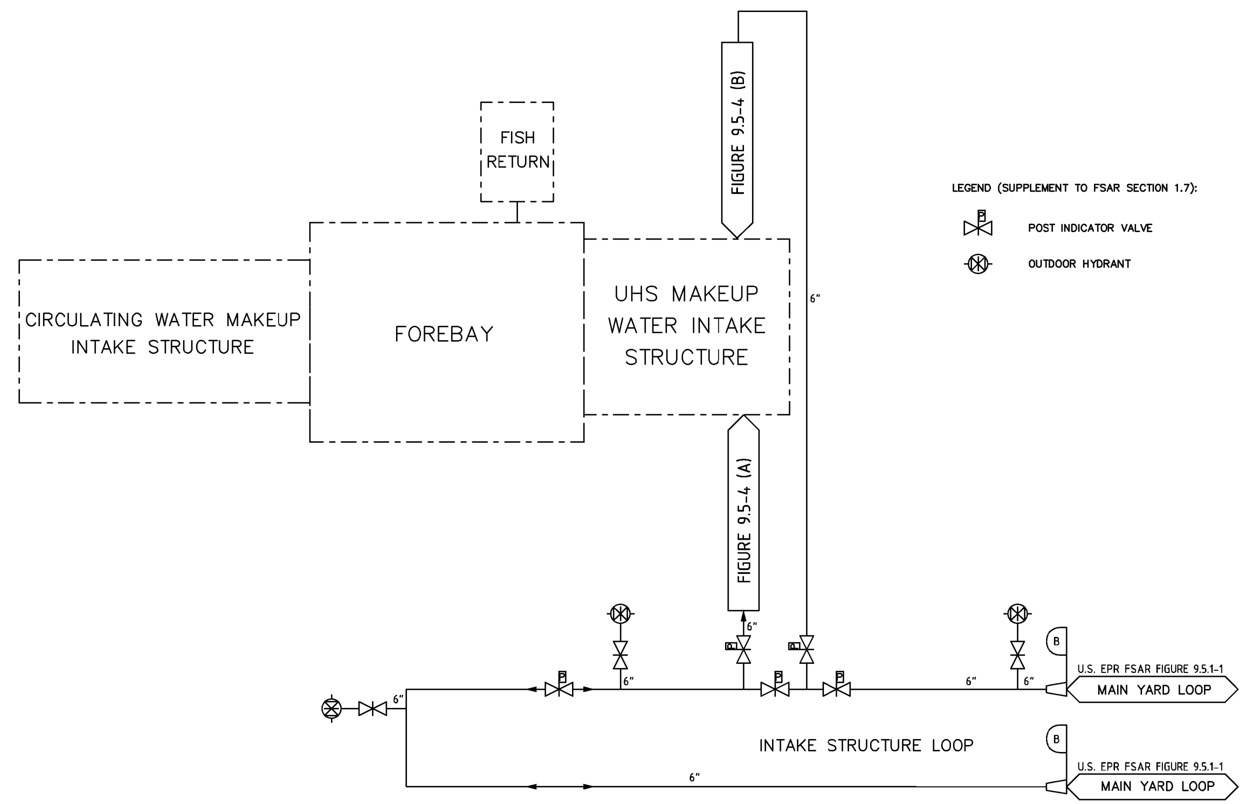
1. The scope of the Regulatory Position presented in this compliance comparison table is abbreviated, due to the depth of detail contained within the Regulatory Position Appendix C itself. The user should refer to Regulatory Guide 1.189 directly for the text portion of each section addressed by the table.
2. The U.S. EPR compliance to the regulatory positions delineated in Regulatory Guide 1.189, "Fire Protection for Nuclear Power Plants," is as indicated by the following definitions:
   - COL Applicant – The COL Applicant will address the subject regulatory position.
   - Compliance – The U.S. EPR design supports compliance with the subject regulatory position.
3. A COL Applicant that references the U.S. EPR design certification will submit site specific information to address the Regulatory Position.

Figure 9.5-1— {CCNPP Unit 3 Fire Water Distribution System – Cooling Tower Loop}



A	NS-AQ	D	250	100	NSC	No	NFPA 24, 2007 ed. NFPA 25, 2002 ed. NFPA 804, 2006 ed.
DESIGN AREA	SSC SAFETY CLASS	SSC QUALITY GROUP	DESIGN PRESSURE PSIG	DESIGN TEMPERATURE °F	SSC SEISMIC CLASS	10 CFR APPENDIX B PROGRAM	COMMERCIAL CODE

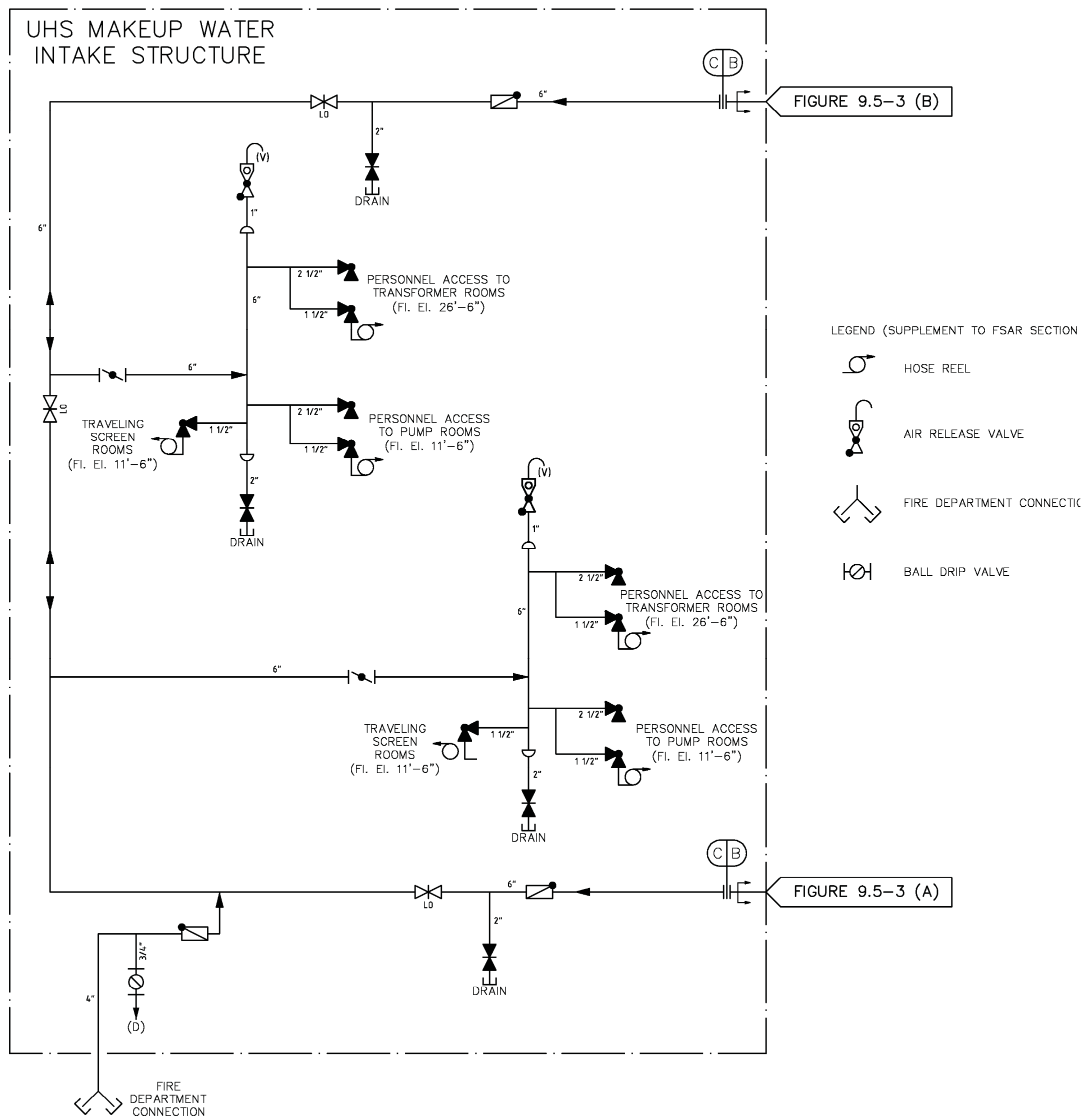
Figure 9.5-2— {CCNPP Unit 3 Fire Water Distribution System – Intake Structure Loop}



DESIGN AREA	SSC SAFETY CLASS	SSC QUALITY GROUP	DESIGN PRESSURE PSIG	DESIGN TEMPERATURE °F	SSC SEISMIC CLASS	10 CFR APPENDIX B PROGRAM (NOTE 1)	COMMERCIAL CODE
B	NS–AQ	D	250	100	II–SSE	Yes	NFPA 24, 2007 ed. NFPA 25. 2002 ed. NFPA 804, 2006 ed. ANSI/ASME B31.1, 2004 ed.

NOTE 1: THOSE SSCs CLASSIFIED AS NS-AQ (FOR SAFETY CLASS) AND CLASSIFIED AS "YES" FOR 10 CFR 50 APPENDIX B WILL BE SUBJECT ONLY TO THOSE QUALITY ASSURANCE REQUIREMENTS OF APPENDIX B THAT ARE PERTINENT TO THAT SSC BASED ON POTENTIAL AFFECT OF THE SSC ON SAFETY-RELATED FUNCTIONS.

Figure 9.5-3— {CCNPP Unit 3 UHS Makeup Water Intake Structure}



DESIGN AREA	SSC SAFETY CLASS	SSC QUALITY GROUP	DESIGN PRESSURE PSIG	DESIGN TEMPERATURE °F	SSC SEISMIC CLASS	10 CFR APPENDIX B PROGRAM (NOTE 1)	COMMERCIAL CODE
C	NS-AQ	D	250	120	II - SSE	YES	NFPA 13, 2007 ed. NFPA 14, 2007 ed. NFPA 25, 2002 ed. NFPA 804, 2006 ed. ANSI/ASME B31.1, 2004 ed.
B	NS-AQ	D	250	100	II - SSE	YES	NFPA 24, 2007 ed. NFPA 25, 2002 ed. NFPA 804, 2006 ed. ANSI/ASME B31.1, 2004 ed.

NOTE 1: THOSE SSCs CLASSIFIED AS NS-AQ (FOR SAFETY CLASS) AND CLASSIFIED AS "YES" FOR 10 CFR 50 APPENDIX B WILL BE SUBJECT ONLY TO THOSE QUALITY ASSURANCE REQUIREMENTS OF APPENDIX B THAT ARE PERTINENT TO THAT SSC BASED ON POTENTIAL AFFECT OF THE SSC ON SAFETY-RELATED FUNCTIONS.

9A FIRE PROTECTION ANALYSIS

Appendix 9A of the U.S. EPR FSAR is incorporated by reference with the following supplement.

The information in U.S. EPR FSAR Appendix 9A – the fire protection analysis of the nuclear island – is supported by additional information provided in Appendix 9B. Appendix 9B provides the fire protection analysis of the remaining power block and balance of plant structures.

Figures 9A-98 through 106 in the U.S. EPR FSAR are identified as conceptual information for the Access Building. These figures and the corresponding fire area parameters in Table 9A-2 of the U.S. EPR FSAR for the Access Building are applicable to the plant.

9B FIRE PROTECTION ANALYSIS - PLANT SPECIFIC SUPPLEMENT

9B.1 INTRODUCTION

The Fire Protection Analysis (FPA) evaluates the potential for occurrence of fires within the plant, documents the capabilities of the fire protection system, and provides reasonable assurance of the capability to safely shut down the plant. The FPA is an integral part of the process of selecting fire prevention, detection, and suppression methods, and provides a design basis for the fire protection system. The design of the fire protection system is described in Section 9.5.1 and U.S. EPR FSAR Section 9.5.1.

This FPA is performed for the remaining power block and balance of plant structures that were not addressed in Appendix 9A. The FPA is performed for each fire area using the methodology addressed in Section 9B.2. The methodology follows the guidance of Regulatory Guide 1.189 (NRC, 2007a). The results of the analysis are provided in Section 9B.3.

Fires are expected to occur over the life of a nuclear power plant and should be treated as anticipated operational occurrences as defined in Appendix A to 10 CFR Part 50. Requirements for protection against radiation during normal operations appear in 10 CFR Part 20. Anticipated operational occurrences of fires should not result in unacceptable radiological consequences applying the exposure criteria of 10 CFR Part 20. Prevention of a radiological release that could result in a radiological hazard to the public, environment, or plant personnel becomes the primary objective during plant shutdown and decommissioning.

9B.1.1 Regulatory Bases

The regulatory bases and requirements applicable to the U.S. EPR design certification and {CCNPP Unit 3} have been previously established, and are only restated in this FPA for completeness. 10 CFR 52.48 (CFR, 2008a) specifies, in part, that applications filed under this subpart will be reviewed for compliance with the standards set out in 10 CFR Part 50 and its appendices.

GDC 3 of Appendix A to 10 CFR Part 50 states:

"Structures, systems, and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions. Noncombustible and heat resistant materials shall be used wherever practical throughout the unit, particularly in locations such as the containment and control room. Fire detection and fighting systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires on structures, systems, and components important to safety. Firefighting systems shall be designed to assure that their rupture or inadvertent operation does not significantly impair the safety capability of these structures, systems, and components."

Additionally, 10 CFR 50.34(h) (CFR, 2008b) requires new reactor license applications to include an evaluation of the facility against the current Standard Review Plan (SRP) guidance. The applicable SRP guidance is specified in Section 9.5.1 of NUREG-0800 (NRC, 2007b). NUREG-0800 describes the areas of review, acceptance criteria and review procedure for NRC review of nuclear power plant fire protection programs. NUREG-0800 in turn invokes Regulatory Guide 1.189, for methods acceptable to the NRC to demonstrate compliance with the SRP review criteria. In addition to the guidance specified in Regulatory Guide 1.189, Section 9.5.1 of NUREG-0800 also invokes SECY-90-016 (NRC, 1990) for additional NRC fire protection requirements applicable to evolutionary reactor designs.

9B.1.2 Defense-In-Depth

The objective of the overall Fire Protection Program is to implement a defense-in-depth strategy to achieve and maintain a high degree of plant safety. This strategy is accomplished by achieving and maintaining a balance between the following:

- Prevent fires from occurring.
- The capability to rapidly detect, control, and promptly extinguish those fires that do occur.
- Adequate protection for structures, systems, and components (SSC) important to safety so that a fire that is not promptly extinguished by fire suppression activities will not prevent safe shutdown of the plant or result in release of radioactive materials to the environment.

The programmatic elements used by the FPA to implement the defense-in-depth strategy are:

- Document and assess the impact of in situ and transient fire hazards on a fire area basis throughout the facility, including potential effects on safe shutdown capability, effects of fire suppression activities, and applicable risk insights from the fire probabilistic fire risk assessment.
- Specify measures for fire prevention, fire detection, fire suppression, and fire confinement.
- Minimize the potential for a fire or fire-related event to place the plant in an unrecoverable condition, cause a release of radioactive materials, or result in radiological exposure to onsite and offsite personnel.
- Specify measures that will provide reasonable assurance that one success path of safe shutdown capability will be available under credible post fire conditions.

9B.1.3 Scope

The scope of the FPA consists of the comprehensive assessment of the fire or explosion hazards for the plant structures in the following list, including a description of the fire protection defense-in-depth features provided to minimize the consequences of such an event.

- Turbine Building (UMA)
- Switchgear Building (UBA)
- Auxiliary Power Transformer Area (UBE)
- Generator Transformer Area (UBF)
- {Warehouse Building (UST)}
- Security Access Building (UYF)
- Central Gas Supply Building (UTG)
- {Grid Systems Control Building (UAC)}

- Fire Protection Building (USG)
- {Circulating Water System Cooling Tower Structure (URA)}
- {Circulating Water System Pump Building (UQA)}
- {Ultimate Heat Sink Makeup Water Intake Structure (UPF)}
- {Circulating Water System Makeup Intake Structure (UPE)}
- {Desalinization/Water Treatment Building (UPQ)}

9B.2 FIRE PROTECTION ANALYSIS METHODOLOGY

9B.2.1 General Design Criteria

As described in Section 9B.1, the fire protection performance objectives are:

- Provide reasonable assurance that one success path of SSC will remain free of fire damage so that hot standby and cold shutdown conditions can be achieved without crediting plant or system repair activities.
- Minimize and control the release of radioactivity to the environment.

To meet these performance objectives, SECY-90-016 (NRC, 1990) specifies the following design criteria:

"Therefore, the evolutionary ALWR designers must ensure the safe shutdown can be achieved, assuming all equipment in any one fire area is rendered inoperable by fire and that re-entry into the fire area for repairs and operator actions is not possible. Because of its physical configuration, the control room is excluded from this approach, provided an independent alternative shutdown capability that is physically and electrically independent of the control room is included in the design. Evolutionary ALWR designers must provide fire protection for redundant shutdown systems in the reactor containment building that will ensure, to the extent practicable, that one shutdown division will be free of fire damage. Additionally, the evolutionary ALWR designers must ensure that smoke, hot gases or the fire suppressant will not migrate into other fire areas to the extent that they could adversely affect safe shutdown capabilities, including operator manual actions."

Based on the previously mentioned criteria, for the U.S. EPR, redundant divisions of safe shutdown systems, components, and cables, including associated circuits (e.g., safety-related, non-safety-related, Class 1E and non-Class 1E), whose failure could affect or prevent post fire safe shutdown capability, should not be located within the same fire area. The exceptions are the control room, because of provision of physically and electrically independent alternative shutdown capability, and the Reactor Building, because of provision of fire protection defense-in-depth features that provide reasonable assurance, to the extent practicable, that one success path of SSC necessary to achieve safe shutdown will remain free of fire damage.

9B.2.2 Specific Elements

To meet this design criterion, the following methodology is employed.

1. In accordance with GDC 3, structures, systems, and components important to safety must be designed and located to minimize the probability and effect of fires and explosions. The requirements of GDC 3 are met, in part, by compartmentation of the plant into separate fire areas. Specifically, based on the hazards present and the need for physical separation of SSC important to safety, the plant is segregated into separate fire areas by passive, fire-rated structural barriers (e.g., walls, floors, and ceilings). In some instances (e.g., Reactor Building), a fire area is sub-divided into fire zones based on physical separation, location of plant equipment, or for FPA purposes. These fire areas and zones serve the primary purpose of confining the effects of fires to a single compartment or area, thereby minimizing the potential for adverse effects from fires on redundant SSC important to safety. Outside of the main control room and the Reactor Building, each of the redundant divisions of emergency core cooling are separated by three hour rated structural fire barriers.

2. Materials used in plant construction are noncombustible or heat resistant to the extent practicable in accordance with GDC 3. Walls, floors, roofs, including structural materials, suspended ceilings, thermal insulation, radiation shielding materials, and soundproofing and interior finish are noncombustible or meet applicable qualification test acceptance criteria unless otherwise justified. Concealed spaces are devoid of combustibles unless otherwise justified.

3. The plant layout also provides reasonable assurance that adequate means of access to all plant areas is provided for manual fire suppression activities and allow safe access and egress for personnel. The layout and travel distances of access and egress routes meet the intent of NFPA 101 (NFPA, 2006) to the extent practicable, unless otherwise justified. Potential delays in plant access or egress due to security locking systems are considered.

4. The in situ plant equipment and components, including electrical cables, housed within each fire area are considered. Any SSC important to safety located within the fire area are considered.

5. In situ fire and explosion hazards associated with plant operations, maintenance, and refueling activities within the fire area are identified (e.g., cables, lube oil, diesel fuel oil, flammable gases, chemicals, building materials, and interior finish). In developing postulated fire scenarios for each fire area, the FPA considers the continuity of combustible materials, susceptibility of the materials to ignition, heat of combustion, heat release rates (HRR), and potential for fire spread.

   In the event that a fire area could be subject to potentially explosive environments from flammable gases or other potentially energetic sources (e.g., chemical treatment systems, ion exchange columns), explosion-prevention features and measures are provided.

   External exposure hazards are identified (e.g., flammable and combustible liquid or gas storage, auxiliary boiler units, natural vegetation) that could potentially expose SSC important to safety to fire effects (i.e., heat, flame, smoke). Wildfire hazards are addressed if the potential for damage to SSC important to safety exists.

6. The credible in situ ignition sources within the fire area are identified. The FPA classifies ignition sources as common or atypical and assign potential fire severity levels on a generic basis using predefined guidance. Most in situ ignition sources are of the common type, which include electrical switchgear cabinets, general electrical and control cabinets, electric motors, pumps (i.e., reactor coolant pumps, feedwater pumps, and other pumps), diesel generators, air compressors, battery banks, boiler heating units, electric dryers, heating, ventilation, air conditioning (HVAC) subsystem components, and others.

   Atypical sources of ignition include arcing electrical faults, hydrogen storage tanks, hydrogen piping, turbine generator exciter hydrogen, outdoor oil-filled transformers, and liquid fuels (i.e., spills). Because of their nature, fires associated with atypical ignition sources are not assigned a generic intensity level.

   Most anticipated fires will involve the common in situ ignition sources as represented by the equipment and components typically found in nuclear power plants. Such fires can be assessed using a fixed fire intensity (i.e., HRR) level for the given fire ignition source. However, consideration of a fixed fire intensity level for a given ignition source may not adequately consider the potential for low-likelihood, high intensity fires. NUREG/CR-6850 (NRC, 2005) addressed this concern by assigning a ranking of two HRR values. The first value assigned is the 75th percentile fire intensity. This means that 75 percent of the fires involving a given ignition source would reach an intensity no greater than the cited fire intensity (absent the fire propagating to any secondary combustibles). The second HRR value is the 98th percentile value, which is intended to represent a high-confidence fire intensity value, which based on the industry guidance cited, is expected to bound the vast majority of fires involving a given ignition source. Table 9B-1—Predefined Severities for Common Plant Ignition Source Fires provides the predefined HRR values associated with common plant ignition sources.

Based on the in situ fire or explosion hazards and sources of ignition present within the fire area under consideration, postulated fire scenarios are developed and assessed. The FPA then assigns a hazard classification to each fire area. This classification is used as a broad characterization of the overall hazard assessment of each fire area. The classification system uses the same category and naming hierarchy as the NFPA 13 (NFPA, 2007) for classification of building occupancies. However, as used herein, these classifications are only intended to be a simplified reflection of the positive correlation between fire severity and the quantity of fuel available to support combustion and the thermal properties (e.g., HRR) of the fuel. The HRR values shown for each fire area hazard classification are only intended to represent the level of intensity that would generally be expected for a fire of this type. These HRR values are not used as a basis for determining worst-case fire scenarios. The classifications used are defined as follows:

- Light Hazard – areas where, in combination or separately, the quantity or combustibility of materials are generally low, and fires with relatively low rates of heat release (e.g., 70 kW) are expected.
- Ordinary Hazard (OH) (Group 1) – areas where the combustibility of materials is generally low, the quantity of materials is moderate (without large concentrations), and fires with moderate rates of heat release (e.g., 200 kW) are expected.
- Ordinary Hazard (OH) (Group 2) – areas where the quantity and combustibility of materials are moderate to high (segregated large concentrations may exist), and fires with moderate to high rates of heat release (e.g., 650 kW) are expected.
- Extra Hazard (EH) (Group 1) – areas where the quantity and combustibility of materials are very high, with materials present that have the potential to result in rapidly developing fires with high rates of heat release (e.g., 2 MW), but with little or no combustible or flammable liquids present.
- Extra Hazard (EH) (Group 2) – areas with moderate to substantial amounts of combustible or flammable liquids present, which would result in fires having very high rates of heat release (e.g., 10 MW).

The predefined higher and lower HRR values associated with common ignition source fires and the corresponding FPA hazard classifications are provided in Table 9B-1.

7. Based on the type and nature of the plant equipment located in the area, the plant activities normally performed in the area, and the frequency of those activities, the FPA provides a transient hazard level (THL) assessment of transient fire hazards into

the fire area analysis. A THL-1 determination generally reflects no need for detailed assessment of transient fire hazards. Depending on the type and quantity of in situ hazards within the area and its FPA hazard classification, a THL-2 determination may or may not reflect the need for detailed assessment of transient fire hazards. A THL-3 determination generally reflects the need for detailed assessment of transient fire hazards within the area analysis. In such cases, the material type, quantity, and associated thermal properties comprising the transient hazard package is evaluated. More than one type of transient hazard source may apply to a given fire area. Section 9B.2.3.3 provides additional information regarding the transient fire hazard determination process.

8. Based on compartmentation of the plant by three hour rated structural fire barriers, additional fire protection features (e.g., fire detection system capability, fixed fire suppression system capability, electrical raceway fire barrier systems) are generally not required in order to provide adequate separation of redundant trains of safe shutdown systems, components, and cables. However, for provision of fire protection features, regulatory requirements and regulatory guidance take precedence.

   Risk-informed, performance-based methods, or other quantitative / computational methods or tools are not utilized to determine where fire detection and suppression systems will or will not be installed. However, where fire detection and suppression systems are provided in accordance with regulatory guidance, recognized fire protection engineering practices, methods, and analytical tools, such as those promulgated by NUREG-1805 (NRC, 2004) and NUREG-1824 (NRC, 2007c) may be used to assess the performance capability of such systems.

9. Based on the previously mentioned considerations, suitable fire protection defense-in-depth features are specified for all plant fire areas.

   The fire protection features provided (e.g., fire barriers and closure devices, fire detection systems, fire suppression systems and equipment) are designed and installed in accordance with applicable regulatory guidance, codes and NFPA standards. Deviations from the above requirements are justified. See U.S. EPR FSAR Section 9.5.1 for further information regarding fire protection features.

10. Appropriate manual fire suppression capability (i.e., hydrants, standpipe and hose systems, and portable fire extinguishers) are specified and described for each plant fire area.

11. Pursuant to GDC 3, the potentially disabling effects of fire suppression systems, due to normal or inadvertent operation, on SSC important to safety are described for each fire area.

12. The FPA describes the means provided to ventilate, exhaust, or isolate each fire area. Additionally, in accordance with SECY-90-016 (NRC, 1990), the ventilation system design provides reasonable assurance that smoke, hot gases, and fire suppressants do not migrate into other fire areas to the extent that they could adversely affect safe shutdown capabilities, including operator manual actions. See U.S. EPR FSAR Section 9.5.1 for further information regarding the ventilation system design.

13. For each fire area, the capability to protect SSC important to safety from flooding associated with automatic and manual fire suppression activities, including inadvertent operation or fire suppression system failure, is considered. The effects of

floor drains on the ability of total flooding gaseous fire suppression systems to achieve and maintain agent concentration upon discharge is considered for applicable fire areas.

In fire areas containing flammable or combustible liquids, the measures are provided to minimize the potential for fire propagation via the drainage system.

14. Emergency lighting required to support fire suppression activities and post fire safe shutdown operations, including access and egress routes to such locations, is described.

15. Plant communication systems, including hardwired and radio systems to provide effective communications between plant personnel performing safe shutdown operations, fire brigade personnel, and the main control room (MCR) or alternative shutdown location, are described.

9B.2.3 Assumptions

9B.2.3.1 General

1. The loss of function of systems used to mitigate the consequences of design basis accidents under post fire conditions does not necessarily impact public safety. The need to limit fire damage to systems required to achieve and maintain safe shutdown conditions is greater than the need to limit fire damage to those systems required to mitigate the consequences of design basis accidents.

2. The systems used for alternative shutdown do not need to be designed to Seismic Category I criteria, single failure criteria, or other design basis accident criteria, except the portions of these systems that interface with or impact safety systems.

3. Fire damage to safe shutdown equipment or fires with the potential to result in release of radioactive materials to the environment is assessed on the basis of a single fire, including an exposure fire. An exposure fire is a fire in a given area that involves either in situ or transient combustibles and has the potential to affect SSC important to safety or radioactive materials located in or adjacent to that same area. The effects of such fire (e.g., smoke, heat, and ignition) can adversely affect those SSC important to safety. Thus, if safe shutdown equipment associated with multiple success paths were located in the same fire area, a fire involving one success path of safe shutdown equipment could constitute an exposure fire to the remaining success paths. A fire involving combustibles other than a redundant success path may constitute an exposure fire to redundant success paths located in the same area.

4. Redundant systems required for design basis accident consequence mitigation, but not required for fire safe shutdown may be damaged by a single exposure fire. The most stringent limitation for fire damage applies toward those systems that are required for both safe shutdown and design basis accident mitigation.

5. The fire event considered for alternative shutdown is a postulated fire in a specific fire area containing redundant safe shutdown cables or equipment where it has been determined that fire protection systems and features can not be provided to provide reasonable assurance that safe shutdown capability will be preserved. For the U.S. EPR, areas requiring alternative shutdown are limited to the control room.

6. It is assumed that a fire may occur at any time, but is not postulated to occur simultaneously with plant accidents or with severe natural phenomena (e.g., floods or

high winds). However, severe natural phenomena (e.g., earthquakes) may initiate a fire event and are considered in evaluating the design capability of fire protection systems and features.

7. In evaluating the capability to accomplish post fire safe shutdown, offsite power may or may not be available and consideration is given to both cases. However, loss of offsite power need not be considered for a fire in non-alternative shutdown areas (i.e., outside of the control room) if it can be shown that offsite power can not be lost because of a fire in that area.

8. Alternative shutdown capability accommodates post fire conditions where offsite power is available and where offsite power is not available for 72 hours. In evaluating safe shutdown circuits, including associated circuits, the availability of uninterrupted power (i.e., offsite power available) may impact the ability to control the safe shutdown of the plant by increasing the potential for associated circuit interactions resulting from fire damage to energized power and control circuits.

9. Intentional station blackout (SBO) is not relied upon to mitigate potential fire damage to safe shutdown systems or associated circuits.

9B.2.3.2 Ignition Sources

1. Self-ignition of electrical cables that are qualified in accordance with a nationally recognized standard fire test methodology, such as IEEE Standard 1202 (IEEE, 2006) is not considered credible due to the protective devices (e.g., fuses, circuit breakers) provided and analyzed to be properly sized. On this basis, qualified electrical cables are considered as potential damage targets, but not ignition sources. Accordingly, any type of electrical cabling routed within metal conduit are considered as potential damage targets, but do not contribute to fire growth and spread. Therefore, they are not considered as ignition sources.

2. Hot work is only considered as a transient ignition source where performance of hot work is consistent with the plant equipment and normal activities to be performed within the fire area.

9B.2.3.3 Transient Fire Hazards

1. THL-1 applies to fire areas that are normally closed to any type of traffic, are not visited often (e.g., not more than once per week), are not occupied during normal plant operations, and where maintenance activities would generally be disallowed during at-power modes of plant operation. Such fire areas should also be subject to administrative controls that disallow leaving or storing unattended transient combustible materials. Examples of THL-1 areas include:

    - Areas where the exposed combustibles are limited to qualified cables, access is strictly controlled, and administrative controls prevent unattended transient combustibles.
    - Cable vaults and other areas having controlled access.
    - MCR (Exception: continuous occupancy of the MCR is not taken as indicative of a higher transient fire likelihood because extraordinary vigilance is expected for this area).
    - Reactor Building.

2. THL-2 applies to fire areas that either have occasional to frequent foot traffic (e.g., not more than once per shift and the area is not a regular access transit pathway) or are occasionally, but not continuously occupied during normal plant operations. Modest storage of transient combustible materials may be allowed. THL-2 would also apply to a fire area where maintenance activities are allowed at-power modes of plant operation, but such maintenance activities are subject to administrative controls (e.g., activity-specific permit process or other combustible controls program measures) and are a relatively rare occurrence (e.g., once per operating year). Examples of THL-2 areas or processes include:

    - Areas not normally locked but are not used as a passage to other areas of the plant (e.g., a DC power distribution panel room at the end of a corridor).
    - Normally unlocked areas that only a few plant personnel may enter once or twice per shift.
    - Areas that normal plant operations may infrequently involve personnel occupation for up to several hours.
    - Areas where the predominate exposed combustibles are qualified cables, but may contain other plant components.
    - Areas where materials may be stored on a temporary basis (e.g., to perform a maintenance or repair activity on nearby equipment). However, such storage should be infrequent rather than routine.
    - Areas where routine maintenance or repair activities (e.g., pump lube oil change-out or motor bearing maintenance) may result in the introduction of transient combustibles or ignition sources on a relatively common basis (e.g., two or more times per year) while the plant is at-power.
    - Most pump rooms and areas within the Nuclear Auxiliary Building.
    - Most switchgear areas and battery rooms, depending on the frequency of maintenance activities.

3. THL-3 generally applies to fire areas that have heavy foot traffic, are frequently or continuously occupied, where transient combustibles are typically stored, where plant refuse is routinely gathered in substantive quantities for collection, where ignition sources are frequently brought into the area, and where maintenance activities are common during normal plant operation. Examples of THL-3 areas include:

    - Plant areas where personnel are present for a large fraction of the time. Paper-based items (e.g., letters, reports, computer printouts.) are brought in and maintained in the area. Small electrical tools or appliances (e.g., hot plates, portable heaters, microwave ovens, and coffee pots) may frequently be used in the area. Also included are health physics access control areas, break room areas, any area used for food preparation, and security stations. While not applicable to the MCR, portions of the control room complex, such as kitchen or security areas may be THL-3.
    - Areas where smoking is not prohibited, or where there is evidence of smoking.

- Areas with open trash cans that routinely contain substantive quantities of general trash.
- Areas where radiation protection gear (e.g., jump suits, gloves, boots) are stored or collected including turn-out and change-out areas.
- Areas used for storage (permanent or temporary) of flammable or combustible liquids or gases.
- Staging areas where items are repaired or constructed before they are taken to other parts of the plant for use or installation.
- Areas where materials are prestaged in anticipation of a planned outage.
- Truck loading and unloading bays.
- Areas where hot work is relatively common during at-power plant operations.
- Areas within the diesel generator areas, intake structures, and the Radiation Waste Building.

9B.3 FIRE AREA-BY-FIRE AREA EVALUATION

The FPA is performed on a fire area by fire area basis for the following plant structures:

- Turbine Building (UMA)
- Switchgear Building (UBA)
- Auxiliary Power Transformer Area (UBE)
- Generator Transformer Area (UBF)
- {Warehouse Building (UST)}
- Security Access Building (UYF)
- Central Gas Supply Building (UTG)
- {Grid Systems Control Building (UAC)}
- Fire Protection Building (USG)
- {Cooling Tower Structure (URA)}
- {Circulating Water Pump Building (UQA)}
- {Ultimate Heat Sink Makeup Water Intake Structure (UPF)}
- {Circulating Water System Makeup Intake Structure (UPE)}
- {Desalinization/Water Treatment Building (UPQ)}

9B.3.1 Turbine Building

9B.3.1.1 Fire Area FA-UMA-01 (Table 9B-2, Column 1)

Fire area FA-UMA-01 is the Turbine Building. It consists of all floor elevations from (-)23 ft to 65 ft, but also includes the condenser pits located at (-)43 ft (below grade elevation). Due to its vast size, fire area FA-UMA-01 is divided into the following fire zones:

Zone Number	Zone Name
FZ-UMA-01	Turbine Building, Floor Elev. (-)23′0″, Plant South
FZ-UMA-02	Turbine Building, Floor Elev. (-)23′0″, Plant North
FZ-UMA-03	Turbine Building, Floor Elev. 0′0″, Plant South
FZ-UMA-04	Turbine Building, Floor Elev. 0′0″, Plant North
FZ-UMA-05	Turbine Building, Floor Elev. 38′0″, Plant South
FZ-UMA-06	Turbine Building, Floor Elev. 38′0″, Plant North
FZ-UMA-07	Turbine Building, Floor Elev. 65′0″

Note: The condenser pits located at (-)43 ft are each included in FZ-UMA-01 and FZ-UMA-02, respectively.

The following areas contained in FA-UMA-01 are specifically cited for their hazards. Their locations are represented by the following descriptions:

Hazard Location	Hazard Name
UMA03-001	Hydrogen Seal Oil Unit
UMA05-001	Lube Oil Drainage Trench 1
UMA05-002	Lube Oil Lines 1
UMA05-003	Turbine-Generator/Exciter Bearings
UMA05-004	Lube Oil Lines 2
UMA05-005	Lube Oil Drainage Trench 2

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UMA-01 from affecting adjacent fire areas.

This fire area is frequently occupied during normal plant operations. The egress route from this area in the event of a fire is via grade level exits provided from each room.

9B.3.1.2 Fire Area FA-UMA-02 (Table 9B-2, Column 2)

Fire area FA-UMA-02 is the Stairwell located in the southeast (plant southeast) corner of the Turbine Building that serves those elevations from (-)23 ft to 115 ft.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UMA-02 from affecting adjacent fire areas.

This fire area is one of four egress routes/exits from the Turbine Building. If this exit becomes obstructed due to fire conditions, three other exit stairwells are available.

9B.3.1.3 Fire Area FA-UMA-03 (Table 9B-2, Column 3)

[Security Related Information - Withheld Under 10 CFR 2.390 - See Part 9 of the COL Application]

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UMA-03 from affecting adjacent fire areas.

This fire area is one of four egress routes/exits from the Turbine Building. If this exit becomes obstructed due to fire conditions, three other exit stairwells are available.

9B.3.1.4 Fire Area FA-UMA-04 (Table 9B-2, Column 4)

Fire area FA-UMA-04 is the Stairwell located in the northeast (plant northeast) corner of the Turbine Building that serves those elevations from (-)23 ft to 115 ft.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UMA-04 from affecting adjacent fire areas.

This fire area is one of four egress routes/exits from the Turbine Building. If this exit becomes obstructed due to fire conditions, three other exit stairwells are available.

9B.3.1.5 Fire Area FA-UMA-05 (Table 9B-2, Column 5)

[Security Related Information - Withheld Under 10 CFR 2.390 - See Part 9 of the COL Application]

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UMA-05 from affecting adjacent fire areas.

This fire area is one of four egress routes/exits from the Turbine Building. If this exit becomes obstructed due to fire conditions, three other exit stairwells are available.

9B.3.1.6 Fire Area FA-UMA-06 (Table 9B-2, Column 6)

Fire area FA-UMA-06 is the Elevator shaft located in the southeast (plant southeast) corner of the Turbine Building from elevation (-)23 ft to 65 ft.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UMA-06 from affecting adjacent fire areas.

This fire area is not used as an egress component and occupants are protected from the effects of fire by rated construction and by elevator control and recall features.

9B.3.1.7 Fire Area FA-UMA-07 (Table 9B-2, Column 7)

Fire area FA-UMA-07 is the Oil Discharge Tank Room located at grade elevation within FZ-UMA-04.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UMA-07 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is through one of multiple doors provided from the room with continuing egress to the exterior of the structure.

9B.3.1.8 Fire Area FA-UMA-08 (Table 9B-2, Column 8)

Fire area FA-UMA-08 is the the Lube Oil Room located 38 ft above grade elevation. It includes the Main Lube Oil Tank, Filter and Cooler and is located within FZ-UMA-06.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UMA-08 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is to through one of multiple doors provided from the room with continuing egress to the exterior of the structure.

9B.3.2 Switchgear Building

9B.3.2.1 Fire Area FA-UBA-01 (Table 9B-2, Column 9)

Fire area FA-UBA-01 is the Switchgear Building floor located 13 ft below grade elevation. Fire area FA-UBA-01 is comprised of the following rooms:

Room Number	Room Name
UBA01-001	Cable Spreading Room 1

Room Number	Room Name
UBA01-002	Cable Spreading Room 2
UBA01-003	SBO Diesel Tank Room 1
UBA01-004	SBO Cable Spreading Room 1
UBA01-005	SBO Cable Spreading Room 2
UBA01-006	SBO Diesel Tank Room 2
UBA01-007	SBO Aux. Equipment Room 1
UBA01-008	SBO Aux. Equipment Room 2
UBA01-009	Corridor

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBA-01 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations.

[Security Related Information - Withheld Under 10 CFR 2.390 - See Part 9 of the COL Application]

9B.3.2.2 Fire Area FA-UBA-02 (Table 9B-2, Column 10)

Fire area FA-UBA-02 is the Switchgear Building floor located 0 ft (grade) elevation. Fire area FA-UBA-02 is comprised of the following rooms:

Room Number	Room Name
UBA02-001	MV Distribution Board Room 1
UBA02-002	480V LV Main Distribution Room 1
UBA02-003	480V LV Main Distribution Room 2
UBA02-004	MV Distribution Board Room 2
UBA02-005	Engine Room 1
UBA02-006	SBO Control Room 1
UBA02-007	SBO Control Room 2
UBA02-008	Engine Room 2
UBA02-009	Auxiliary Boiler Equipment Room
UBA02-010	Corridor

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBA-02 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations.

[Security Related Information - Withheld Under 10 CFR 2.390 - See Part 9 of the COL Application]

9B.3.2.3 Fire Area FA-UBA-03 (Table 9B-2, Column 11)

Fire area FA-UBA-03 is the Switchgear Building floor located 13 ft above grade elevation. Fire area FA-UBA-03 is comprised of the following rooms:

Room Number	Room Name
UBA03-001	Cable Distribution Division Room 1
UBA03-002	Cable Distribution Division Room 2
UBA03-003	Corridor

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBA-03 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via Turbine Building exit stairwells FA-UMA-03 and FA-UMA-05.

9B.3.2.4 Fire Area FA-UBA-04 (Table 9B-2, Column 12)

Fire area FA-UBA-04 is the Switchgear Building floor located 24.5 ft above grade elevation. Fire area FA-UBA-04 is comprised of the following rooms:

Room Number	Room Name
UBA04-001	Battery Room 1
UBA04-002	Battery Charger Room 1
UBA04-003	I&C Control & Protection Panel Room 1
UBA04-004	I&C Control & Protection Panel Room 2
UBA04-005	Battery Charger Room 2
UBA04-006	Battery Room 2
UBA04-007	Air Handling Room 1
UBA04-008	Air Handling Room 2
UBA04-009	Corridor

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBA-04 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations.

[Security Related Information - Withheld Under 10 CFR 2.390 - See Part 9 of the COL Application]

9B.3.3 Auxiliary Power Transformer Area

9B.3.3.1 Fire Area FA-UBE-01 (Table 9B-2, Column 13)

Fire area FA-UBE-01 is the area that houses the Emergency Auxiliary Power Transformer number 1 (EAT 1) and associated equipment in structure 31UBE. Fire area FA-UBE-01 is comprised of the following zones:

Zone Number	Fire Zone Description
FZ-UBE-01	Cubicle housing the EAT 1 Transformer (30BDT01)

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBE-01 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.

9B.3.3.2 Fire Area FA-UBE-02 (Table 9B-2, Column 14)

Fire area FA-UBE-02 is the area that houses the Normal Auxiliary Power Transformer number 1 (NAT 1) and associated equipment in structure 32UBE. Fire area FA-UBE-02 is comprised of the following zones:

Zone Number	Fire Zone Description
FZ-UBE-02	Cubicle housing the NAT 1 Transformer (30BBT01)

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBE-02 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.

9B.3.3.3 Fire Area FA-UBE-03 (Table 9B-2, Column 15)

Fire area FA-UBE-03 is the area that houses the Normal Auxiliary Power Transformer number 2 (NAT 2) and associated equipment in structure 33UBE. Fire area FA-UBE-03 is comprised of the following zones:

Zone Number	Fire Zone Description
FZ-UBE-03	Cubicle housing the NAT 2 Transformer (30BBT02)

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBE-03 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.

9B.3.3.4 Fire Area FA-UBE-04 (Table 9B-2, Column 16)

Fire area FA-UBE-04 is the area that houses the Normal Auxiliary Power Transformer number 3 (NAT 3) and associated equipment in structure 34UBE. Fire area FA-UBE-04 is comprised of the following zones:

Zone Number	Fire Zone Description
FZ-UBE-04	Cubicle housing the NAT 3 Transformer (30BBT03)

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBE-04 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.

9B.3.3.5 Fire Area FA-UBE-05 (Table 9B-2, Column 17)

Fire area FA-UBE-05 is the area that houses the Emergency Auxiliary Power Transformer number 2 (EAT 2) and associated equipment in structure 35UBE. Fire area FA-UBE-05 is comprised of the following zones:

Zone Number	Fire Zone Description
FZ-UBE-05	Cubicle housing the EAT 2 Transformer (30BDT02)

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBE-04 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.

9B.3.4 Generator Transformer Area

9B.3.4.1 Fire Area FA-UBF-01 (Table 9B-2, Column 18)

Fire area FA-UBF-01 is the area that houses the Main Step-Up (MSU) Transformer 30BAT01 and associated equipment in structure 31UBF. Fire area FA-UBF-01 is comprised of the following zones:

Zone Number	Fire Zone Description
FZ-UBF-01	Cubicle housing the MSU Transformer 30BAT01

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBF-01 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.

9B.3.4.2 Fire Area FA-UBF-02 (Table 9B-2, Column 19)

Fire area FA-UBF-02 is the area that houses the Main Step-Up (MSU) Transformer 30BAT02 and associated equipment in structure 33UBF. Fire area FA-UBF-02 is comprised of the following zones:

Zone Number	Fire Zone Description
FZ-UBF-02	Cubicle housing the MSU Transformer 30BAT02

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBF-02 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.

9B.3.4.3 Fire Area FA-UBF-03 (Table 9B-2, Column 20)

Fire area FA-UBF-03 is the area that houses the Main Step-Up (MSU) Transformer 30BAT03 and associated equipment in structure 33UBF. Fire area FA-UBF-03 is comprised of the following zones:

Zone Number	Fire Zone Description
FZ-UBF-03	Cubicle housing the MSU Transformer 30BAT03

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBF-03 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.

9B.3.4.4 Fire Area FA-UBF-04 (Table 9B-2, Column 21)

Fire area FA-UBF-04 is the area that houses the spare Main Step-Up (MSU) Transformer 30BAT04 and associated equipment in structure 34UBF. Fire area FA-UBF-04 is comprised of the following zones:

Zone Number	Fire Zone Description
FZ-UBF-04	Cubicle housing the spare MSU Transformer 30BAT04

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UBF-04 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. This exterior area is not enclosed by significant egress impediments/obstructions.

9B.3.5 {Warehouse Building

9B.3.5.1 Fire Area FA-UST-01 (Table 9B-2, Column 22)

Fire area FA-UST-01 is the Warehouse Building. It consists of the following rooms:

Room Number	Room Name
UST-01-001	Office
UST-01-002	Storage Area

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UST-01 from affecting adjacent fire areas.

This fire area is frequently occupied during normal plant operations. The egress route from this area in the event of a fire is via the stair enclosures located at each corner of the Warehouse Building. }

9B.3.6 Security Access Facility

9B.3.6.1 Fire Area FA-UYF-01 (Table 9B-2, Column 23)

Fire area FA-UYF-01 is the Security Access Facility.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UYF-01 from affecting adjacent fire areas.

This fire area is frequently occupied during normal plant operations. The egress route from this area in the event of a fire is via grade level exits.

9B.3.7 Central Gas Supply Building

9B.3.7.1 Fire Area FA-UTG-01 (Table 9B-2, Column 24)

Fire area FA-UTG-01 is the oxygen cylinder storage room.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UTG-01 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via multiple exits to the exterior located at grade elevation.

9B.3.7.2 Fire Area FA-UTG-02 (Table 9B-2, Column 25)

Fire area FA-UTG-02 is the miscellaneous gas cylinder storage room. Gases stored in this area include argon, nitrogen, and argon-methane (flammable – 90% argon, 10% methane).

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UTG-02 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via multiple exits to the exterior located at grade elevation.

9B.3.7.3 Fire Area FA-UTG-03 (Table 9B-2, Column 26)

Fire area FA-UTG-03 is the hydrogen cylinder storage room. Only hydrogen gas is stored in this area.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UTG-03 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via multiple exits to the exterior located at grade elevation.

9B.3.8 {Grid Systems Control Building

9B.3.8.1 Fire Area FA-UAC-01 (Table 9B-2, Column 27)

Fire area FA-UAC-01 is one of two switchyard control rooms and is designated as Switchyard Control Room 1.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UAC-01 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via multiple exits to the exterior located at grade elevation.

9B.3.8.2 Fire Area FA-UAC-02 (Table 9B-2, Column 28)

Fire area FA-UAC-02 is one of two switchyard control rooms and is designated as Switchyard Control Room 2.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UAC-02 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via multiple exits to the exterior located at grade elevation.}

9B.3.9 Fire Protection Building

9B.3.9.1 Fire Area FA-USG-01 (Table 9B-2, Column 29)

Fire area FA-USG-01 is one of two diesel fire pump rooms and is designated as Diesel Fire Pump Room 1.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-USG-01 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via a single exit to the exterior.

9B.3.9.2 Fire Area FA-USG-02 (Table 9B-2, Column 30)

Fire area FA-USG-02 is one of two diesel fire pump rooms and is designated as Diesel Fire Pump Room 2.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-USG-02 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via a single exit to the exterior.

9B.3.9.3 Fire Area FA-USG-03 (Table 9B-2, Column 31)

Fire area FA-USG-03 is the electric and jockey fire pump room.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-USG-03 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via a single exit to the exterior.

9B.3.10 {Circulating Water System Cooling Tower Structure

9B.3.10.1 Fire Area FA-URA-01 (Table 9B-2, Column 32)

Fire area FA-URA-01 is the Circulating Water System Cooling Tower Structure.

The adequacy of the fire protection features provided are sufficient to prevent a fire originating within fire area FA-URA-01 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations.

9B.3.11 Circulating Water System Pump Building

9B.3.11.1 Fire Area FA-UQA-01 (Table 9B-2, Column 33)

Fire area FA-UQA-01 is the electrical room housing the electrical equipment providing power and control for the circulating water system pumps.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UQA-01 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via a single exit to the exterior.

9B.3.11.2 Fire Area FA-UQA-02 (Table 9B-2, Column 34)

Fire area FA-UQA-02 is grade and below grade portion of the circulating water system pump building which houses the four circulating water system pumps.

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UQA-02 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via the two grade level exits to the exterior.

9B.3.12 Ultimate Heat Sink Makeup Water Intake Structure

9B.3.12.1 Fire Area FA-UPF-01 (Table 9B-2, Column 35)

Fire area FA-UPF-01 is one of the four UHS makeup water pump, electrical, traveling screen and forebay divisions. Fire area FA-UPF-01 consists of the following rooms:

Room Number	Room Name
UPF03-001	Air Cooled Condenser Room 1
UPF03-002	Transformer Room 1
UPF02-001	UHS Makeup Water Pump Room 1
UPF02-003	Traveling Screen Room 1
UPF01-001	UHS Makeup Water Intake Forebay Area 1

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UPF-01 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from the Air Cooled Condenser Room, Transformer Room and UHS Makeup Water Pump Room in the event of a fire is via the building corridors two exits: a single escape ladder to the roof, or a single grade level exit to the exterior. The egress route from the Traveling Screen Room in the event of fire is through two grade level exits to the exterior.

9B.3.12.2 Fire Area FA-UPF-02 (Table 9B-2, Column 36)

Fire area FA-UPF-02 is the corridor/stairwell enclosure serving the UHS Makeup Water Intake Structure. Fire area FA-UPF-02 consists of the following rooms:

Room Number	Room Name
UPF03-003	Personnel Access to Electrical Rooms
UPF02-002	Personnel Access to Pump Rooms
UPF02-010	Vestibule

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UPF-02 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via a single grade level exit to the exterior or a single escape ladder to the roof.

9B.3.12.3 Fire Area FA-UPF-03 (Table 9B-2, Column 37)

Fire area FA-UPF-03 is one of the four UHS makeup water pump, electrical, traveling screen and forebay divisions. Fire area FA-UPF-03 consists of the following rooms:

Room Number	Room Name
UPF03-004	Air Cooled Condenser Room 2
UPF03-005	Transformer Room 2
UPF02-004	UHS Makeup Water Pump Room 2
UPF02-005	Traveling Screen Room 2
UPF01-002	UHS Makeup Water Intake Forebay Area 2

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UPF-03 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from the Air Cooled Condenser Room, Transformer Room and UHS Makeup Water Pump Room in the event of a fire is via the building corridors two exits: a single escape ladder to the roof, or a single grade level exit to the exterior. The egress route from the Traveling Screen Room in the event of fire is through two grade level exits to the exterior.

9B.3.12.4 Fire Area FA-UPF-04 (Table 9B-2, Column 38)

Fire area FA-UPF-04 is one of the four UHS makeup water pump, electrical, traveling screen and forebay divisions. Fire area FA-UPF-04 consists of the following rooms:

Room Number	Room Name
UPF03-006	Air Cooled Condenser Room 3
UPF03-007	Transformer Room 3
UPF02-006	UHS Makeup Water Pump Room 3
UPF02-007	Traveling Screen Room 3
UPF01-003	UHS Makeup Water Intake Forebay Area 3

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UPF-04 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from the Air Cooled Condenser Room, Transformer Room and UHS Makeup Water Pump Room in the event of a fire is via the building corridors two exits: a single escape ladder to the roof, or a single grade level exit to the exterior. The egress route from the Traveling Screen Room in the event of fire is through two grade level exits to the exterior.

9B.3.12.5 Fire Area FA-UPF-05 (Table 9B-2, Column 39)

Fire area FA-UPF-05 is one of the four UHS makeup water pump, electrical, traveling screen and forebay divisions. Fire area FA-UPF-05 consists of the following rooms:

Room Number	Room Name
UPF03-008	Air Cooled Condenser Room 4
UPF03-009	Transformer Room 4
UPF02-008	UHS Makeup Water Pump Room 4
UPF02-009	Traveling Screen Room 4
UPF01-004	UHS Makeup Water Intake Forebay Area 4

The adequacy of the fire protection features provided is sufficient to prevent a fire originating within fire area FA-UPF-05 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from the Air Cooled Condenser Room, Transformer Room and UHS Makeup Water Pump Room in the event of a fire is via the building corridors two exits: a single escape ladder to the roof, or a single grade level exit to the exterior. The egress route from the Traveling Screen Room in the event of fire is through two grade level exits to the exterior.

9B.3.13 Circulating Water System Makeup Intake Structure

9B.3.13.1 Fire Area FA-UPE-01 (Table 9B-2, Column 40)

Fire area FA-UPE-01 is the electrical equipment room providing power and control for the circulating water system makeup pumps.

The adequacy of the fire protection features provided are sufficient to prevent a fire originating within fire area FA-UPE-01 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. The egress route from this area is via single exit to the exterior.

9B.3.13.2 Fire Area FA-UPE-02 (Table 9B-2, Column 41)

Fire area FA-UPE-02 is the grade and below grade portion of the circulating water system makeup intake structure which houses the three circulating water makeup pumps.

The adequacy of the fire protection features provided are sufficient to prevent a fire originating within fire area FA-UPE-02 from affecting adjacent fire areas.

This fire area is not normally occupied during normal plant operations. The egress route from this area in the event of a fire is via a single grade level exit to the exterior and via multiple ladders from below grade.

9B.3.14 Desalinization/Water Treatment Building

9B.3.14.1 Fire Area FA-UPQ-01 (Table 9B-2, Column 42)

Fire area FA-UQP-01 is the Desalinization and Water Treatment Building.

The adequacy of the fire protection features provided are sufficient to prevent a fire originating within fire area FA-UPQ-01 from affecting adjacent fire areas.

This fire area is occasionally occupied during normal plant operations. The egress route from this area in the event of a fire is via multiple exits located at grade elevation.}

9B.4 REFERENCES

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Table 9B-1— Predefined Severities for Common Plant Ignition Source Fires
(Page 1 of 1)

Fire Size (Hazard Classification)	Small Electrical Fire	Large Electrical Fire	Indoor Oil-Filled Transformers	Very Large Fire Sources	Engines and Heaters	Solid and Transient Combustibles
70 kW (Light)	75th Percentile Fire				75th Percentile Fire	75th Percentile Fire
200 kW (OH-Group 1)	98th Percentile Fire	75th Percentile Fire			98th Percentile Fire	98th Percentile Fire
650 kW (OH Group 2)		98th Percentile Fire	75th Percentile Fire	75th Percentile Fire		
2 MW (EH Group 1)			98th Percentile Fire			
10 MW (EH Group 2)				98th Percentile Fire		

Table 9B-2— {Fire Area Parameters}
(Page 1 of 19)

Column	1	2	3	4	5
Fire Area	FA-UMA-01	FA-UMA-02	FA-UMA-03	FA-UMA-04	FA-UMA-05
Building or Area	UMA	UMA	UMA	UMA	UMA
Figures	Figure 9B-1 through Figure 9B-5, Figure 9B-7, Figure 9B-9	Figure 9B-1 through Figure 9B-4, Figure 9B-6, Figure 9B-8	Figure 9B-1 through Figure 9B-4, Figure 9B-6	Figure 9B-1 through Figure 9B-4, Figure 9B-6	Figure 9B-1 through Figure 9B-4, Figure 9B-6,
Fire Barriers (Notes 3,4,5,6)	See Figures	See Figures	See Figures	See Figures	See Figures
SSC: important to safety	None	None	None	None	None
SCC: post-fire safe shutdown	None	None	None	None	None
In situ Loading (Note 1)	a, b, c, d, f, g, j	None	None	None	None
Transient Fire Loading	THL-3	THL-2	THL-2	THL-2	THL-2
Common Ignition Source (Note 2a)	a, b, c, d, e, m	a	a	a	a
Atypical Ignition Sources (Note 2b)	cc, dd, ee	None	None	None	None
Hazard Classification (Note 13)	OH Group-2	Light Hazard	Light Hazard	Light Hazard	Light Hazard
Automatic Fire Detection	Yes (Hazard specific) 05-003 T-G/Exciter Brgs 03-001 H2 Seal Oil Unit 05-001 LO Drain Trench 1 05-005 LO Drain Trench 2	No	No	No	No
Manual Fire Alarms	Yes	Yes	Yes	Yes	Yes
Automatic Fixed Fire Suppression	Yes (Hazard & Zone specific) Auto wet-pipe: Turbine underfloor zones & skirt, and Lube Oil lines 1 and 2 Auto pre-action: T-G/ Exciter Bearings Auto water spray: H2 Seal Oil Unit, and Lube Oil Drain Trenches	Yes	Yes	Yes	Yes
Manual Fixed Fire Suppression	No	No	No	No	No
Standpipe and Hose System (Note 7)	Yes	Yes	Yes	Yes	Yes

Table 9B-2— {Fire Area Parameters}
(Page 2 of 19)

Column	1	2	3	4	5
Portable Fire Extinguishers (Note 8)	Yes	Yes	Yes	Yes	Yes
Suppression Affects	Note 14	Note 14	Note 14	Note 14	Note 14
Plant Drains	Note 9	Note 9	Note 9	Note 9	Note 9
Radiological Affects	None	None	None	None	None
HVAC	Note 10 Smoke and heat vents	Note 10	Note 10	Note 10	Note 10
Emergency Lighting (Note 11)	aa	aa	aa	aa	aa
Communication (Note 12)	Yes	Yes	Yes	Yes	Yes
Engineering Evaluations	None	None	None	None	None

Table 9B-2— {Fire Area Parameters}
(Page 3 of 19)

Column	6	7F	8	9	10
Fire Area	FA-UMA-06	FA-UMA-07	FA-UMA-08	FA-UBA-01	FA-UBA-02
Building or Area	UMA	UMA	UMA	UBA	UBA
Figures	Figure 9B-1 through Figure 9B-4, Figure 9B-6	Figure 9B-2, Figure 9B-9	Figure 9B-3, Figure 9B-7, Figure 9B-8	Figure 9B-10, Figure 9B-14	Figure 9B-11, Figure 9B-12, Figure 9B-13, Figure 9B-14
Fire Barriers (Notes 3,4,5,6)	See Figures	See Figures	See Figures	See Figures	See Figures
SSC: important to safety	None	None	None	None	None
SCC: post-fire safe shutdown	None	None	None	None	None
In situ Loading (Note 1)	a, c, d, e, g, j	d	a, c, d, e, g, j	a, b, c, d, e, g, j, n	a, b, c, d, e, g, j, k, n, s
Transient Fire Loading	THL-2	THL-2	THL-2	THL-2	THL-2
Common Ignition Source (Note 2a)	a, b, m	a	a, b, c, d, m	a, b, c, d, g, m	a, b, c, d, g, i, k, m
Atypical Ignition Sources (Note 2b)	None	ee	ee	aa, ee	aa, ee
Hazard Classification (Note 13)	OH Group-1	EH Group-2	EH Group-2	EH Group-2 EH Group-1 Light	EH Group-2 OH Group-1 Light
Automatic Fire Detection	No	No	No	Yes (Hazard specific) 01-001 Cable Spread Rm 1 01-002 Cable Spread Rm 2 01-004 SBO Cable Spread Rm 1 01-005 SBO Cable Spread Rm 2 01-003 SBO Diesel Tank Rm 1 01-006 SBO Diesel Tank Rm 2	Yes (Hazard specific) 02-001 MV Dist Bd Rm 1 02-002 LV Main Dist Rm 1 02-003 LV Main Dist Rm 2 02-004 MV Dist Bd Rm 2 02-006 SBO Control Rm 1 02-007 SBO Control Rm 2 02-005 Engine Rm 1 02-008 Engine Rm 2
Manual Fire Alarms	Yes	Yes	Yes	Yes	Yes
Automatic Fixed Fire Suppression	Yes	Yes	Yes	Yes (Hazard specific) Auto wet-pipe: SBO Diesel Tank Rooms, SBO Aux. Equip. Rms, and Corridor Auto double interlock pre-action: Cable Spreading Rooms	Yes (Hazard specific) Auto wet-pipe: Engine Rooms, Aux. Boiler Equip. Rm and Corridor Auto double interlock pre-action: MV and LV Distrib Board Rms and SBO Control Rooms

Table 9B-2— {Fire Area Parameters}
(Page 4 of 19)

Column	6	7F	8	9	10
Manual Fixed Fire Suppression	No	No	No	No	No
Standpipe and Hose System (Note 7)	Yes	Yes	Yes	Yes	Yes
Portable Fire Extinguishers (Note 8)	Yes	Yes	Yes	Yes	Yes
Suppression Affects	Note 14	Note 14	Note 14	Note 14	Note 14
Plant Drains	Note 9	Note 9	Note 9	Note 9	Note 9
Radiological Affects	None	None	None	None	None
HVAC	Note 10	Note 10	Note 10	Note 10	Note 10
Emergency Lighting (Note 11)	aa	aa	aa	aa	aa
Communication (Note 12)	Yes	Yes	Yes	Yes	Yes
Engineering Evaluations	None	None	None	None	None

Table 9B-2— {Fire Area Parameters}
(Page 5 of 19)

Column	11	12	13	14	15
Fire	FA-UBA-03	FA-UBA-04	FA-UBE-01	FA-UBE-02	FA-UBE-03
Building or Area	UBA	UBA	UBE	UBE	UBE
Figures	Figure 9B-12, Figure 9B-14	Figure 9B-13, Figure 9B-14	Figure 9B-15	Figure 9B-15	Figure 9B-15
Fire Barriers (Notes 3,4,5,6)	See Figures	See Figures	See Figure	See Figure	See Figures
SSC: important to safety	None	None	None	None	None
SCC: post-fire safe shutdown	None	None	None	None	None
In situ Loading (Note 1)	a, c, g, e	a, b, c, e, f, g, h, m	a, e, g, l	a, e, g, l	a, e, g, l
Transient Fire Loading	THL-2	THL-2	THL-2	THL-2	THL-2
Common Ignition Source (Note 2a)	a, b, g, m	a, b, g, j, k, m	a, b, f	a, b, f	a, b, f
Atypical Ignition Sources (Note 2b)	aa	aa	aa, ee, ff	aa, ee, ff	aa, ee, ff
Hazard Classification (Note 13)	EH Group-1 Light	OH Group-2 OH Group-1 Light	EH Group-2	EH Group-2	EH Group-2
Automatic Fire Detection	Yes (Hazard specific) 03-001 Cable Dist Div., Rm 1 03-002 Cable Dist Div., Rm 2	Yes (Hazard specific) 04-001 Battery Rm 1 04-002 Battery Chgr Rm 1 04-003 I&C C&P Panel Rm 1 04-004 I&C C&P Panel Rm 2 04-005 Battery Chgr Rm 2 04-006 Battery Rm 2	Yes	Yes	Yes
Manual Fire Alarms	Yes	Yes	No	No	No

Table 9B-2— {Fire Area Parameters}
(Page 6 of 19)

Column	11	12	13	14	15
Automatic Fixed Fire Suppression	Yes (Hazard specific) Auto wet-pipe: Corridor Auto double interlock pre-action: Cable Distribution Division Rooms	Yes (Hazard specific) Auto wet-pipe: Air Handling Rms and Corridor Auto double interlock pre-action: Battery Rms, Battery Charger Rms, and I&C Control / Protection Panel Rms	Yes	Yes	Yes
Manual Fixed Fire Suppression	No	No	No	No	No

Table 9B-2— {Fire Area Parameters}
(Page 7 of 19)

Column	11	12	13	14	15
Standpipe and Hose System (Note 7)	Yes	Yes	No	No	No
Portable Fire Extinguishers (Note 8)	Yes	Yes	No	No	No
Suppression Affects	Note 14	Note 14	Note 14	Note 14	Note 14
Plant Drains	Note 9	Note 9	Note 9	Note 9	Note 9
Radiological Affects	None	None	None	None	None
HVAC	Note 10	Note 10	Note 10	Note 10	Note 10
Emergency Lighting (Note 11)	aa	aa	None	None	None
Communication (Note 12)	Yes	Yes	Yes	Yes	Yes
Engineering Evaluations	None	None	None	None	None

Table 9B-2— {Fire Area Parameters}
(Page 8 of 19)

Column	16	17	18	19	20
Fire Area	FA-UBE-04	FA-UBE-05	FA-UBF-01	FA-UBF-02	FA-UBF-03
Building or Area	UBE	UBE	UBF	UBF	UBF
Figures	Figure 9B-15	Figure 9B-15	Figure 9B-15	Figure 9B-15	Figure 9B-15
Fire Barriers (Notes 3,4,5,6)	See Figures	See Figures	See Figures	See Figures	See Figures
SSC: important to safety	None	None	None	None	None
SCC: post-fire safe shutdown	None	None	None	None	None
In situ Loading (Note 1)	a, e, g, l	a, e, g, l	a, e, g, l	a, e, g, l	a, e, g, l
Transient Fire Loading	THL-2	THL-2	THL-2	THL-2	THL-2
Common Ignition Source (Note 2a)	a, b, f	a, b, f	a, b, f	a, b, f	a, b, f
Atypical Ignition Sources (Note 2b)	aa, ee, ff	aa, ee, ff	aa, ee, ff	aa, ee, ff	aa, ee, ff
Hazard Classification (Note 13)	EH Group-2	EH Group-2	EH Group-2	EH Group-2	EH Group-2
Automatic Fire Detection	Yes	Yes	Yes	Yes	Yes
Manual Fire Alarms	No	No	No	No	No
Automatic Fixed Fire Suppression	Yes	Yes	Yes	Yes	Yes
Manual Fixed Fire Suppression	No	No	No	No	No
Standpipe and Hose System (Note 7)	No	No	No	No	No
Portable Fire Extinguishers (Note 8)	No	No	No	No	No
Suppression Affects	Note 14	Note 14	Note 14	Note 14	Note 14
Plant Drains	Note 9	Note 9	Note 9	Note 9	Note 9
Radiological Affects	None	None	None	None	None
HVAC	Note 10	Note 10	Note 10	Note 10	Note 10
Emergency Lighting (Note 11)	None	None	None	None	None
Communication (Note 12)	Yes	Yes	Yes	Yes	Yes
Engineering Evaluations	None	None	None	None	None

Table 9B-2— {Fire Area Parameters}
(Page 9 of 19)

Column	21	22	23	24	25
Fire Area	FA-UBF-04	FA-UST-01	FA-UYF-01	FA-UTG-01	FA-UTG-02
Building or Area	UBF	UST	UYF	UTG	UTG
Figures	Figure 9B-15	Figure 9B-16	Figure 9B-17	Figure 9B-18	Figure 9B-18
Fire Barriers (Notes 3,4,5,6)	See Figures	See Figures	See Figures	See Figures	See Figures
SSC: important to safety	None	None	None	None	None
SCC: post-fire safe shutdown	None	None	None	None	None
In situ Loading (Note 1)	a, e, g, l	a, b, c, d, r, s	a, b, c, r, s	a, c, g, j	a, c, g, j, u
Transient Fire Loading	THL-2	THL-3	THL-3	THL-1	THL-1
Common Ignition Source (Note 2a)	a, b, f	a, c	a	a, m	a, m
Atypical Ignition Sources (Note 2b)	aa, ee, ff	ee	None	None	None
Hazard Classification (Note 13)	EH Group-2	OH Group-2	Light Hazard	EH Group-2	OH Group-2
Automatic Fire Detection	Yes	No	Yes	No	No
Manual Fire Alarms	No	Yes	Yes	Yes	Yes
Automatic Fixed Fire Suppression	Yes	Yes	No	Yes	Yes
Manual Fixed Fire Suppression	No	No	No	No	No
Standpipe and Hose System (Note 7)	No	Yes (Note 7a)	No	No	No
Portable Fire Extinguishers (Note 8)	No	Yes	Yes	Yes	Yes
Suppression Affects	Note 14	Note 14	Note 14	Note 14	Note 14
Plant Drains	Note 9	Note 9	Note 9	Note 9	Note 9
Radiological Affects	None	None	None	None	None
HVAC	Note 10	Note 10	Note 10	Note 10	Note 10
Emergency Lighting (Note 11)	None	aa	aa	aa	aa
Communication (Note 12)	Yes	Yes	Yes	Yes	Yes
Engineering Evaluations	None	None	None	None	None

Table 9B-2— {Fire Area Parameters}
(Page 10 of 19)

Column	26	27	28	29	30
Fire Area	FA-UTG-03	FA-UAC-01	FA-UAC-02	FA-USG-01	FA-USG-02
Building or Area	UTG	UAC	UAC	USG	USG
Figures	Figure 9B-18	Figure 9B-19	Figure 9B-19	Figure 9B-20	Figure 9B-20
Fire Barriers (Notes 3,4,5,6)	See Figures	See Figures	See Figures	See Figures	See Figures
SSC: important to safety	None	None	None	None	None
SCC: post-fire safe shutdown	None	None	None	None	None
In situ Loading (Note 1)	a, c, f, g, j	a, b, c, d, e, f, g, j, m, r, s, v	a, b, c, d, e, f, g, j, m, r, s, v	a, c, d, g, j, n	a, c, d, g, j, n
Transient Fire Loading	THL-1	THL-2	THL-2	THL-2	THL-2
Common Ignition Source (Note 2a)	a, m	a, b, j, m	a, b, j, m	a, b, d, m	a, b, d, m
Atypical Ignition Sources (Note 2b)	bb	None	None	ee	ee
Hazard Classification (Note 13)	EH Group-2	OH Group-1	OH Group-1	EH Group-2	EH Group-2
Automatic Fire Detection	No (H2 gas detection w/ exhaust auto-start)	Yes	Yes	No	No
Manual Fire Alarms	Yes	Yes	Yes	Yes	Yes
Automatic Fixed Fire Suppression	Yes	No	No	Yes	Yes
Manual Fixed Fire Suppression	No	No	No	No	No
Standpipe and Hose System (Note 7)	No	No	No	No	No
Portable Fire Extinguishers (Note 8)	Yes	Yes	Yes	Yes	Yes
Suppression Affects	Note 14	Note 14	Note 14	Note 14	Note 14
Plant Drains	Note 9	Note 9	Note 9	Note 9	Note 9
Radiological Affects	None	None	None	None	None
HVAC	Note 10	Note 10	Note 10	Note 10	Note 10
Emergency Lighting (Note 11)	aa	aa	aa	aa	aa
Communication (Note 12)	Yes	Yes	Yes	Yes	Yes
Engineering Evaluations	None	None	None	None	None

Table 9B-2— {Fire Area Parameters}
(Page 11 of 19)

Column	31	32	33	34	35
Fire Area	FA-USG-03	FA-URA-01	FA-UQA-01	FA-UQA-02	FA-UPF-01
Building or Area	USG	URA	UQA	UQA	UPF
Figures	Figure 9B-20	Figure 9B-21	Figure 9B-22	Figure 9B-22	Figure 9B-23
Fire Barriers (Notes 3,4,5,6)	See Figures	See Figures	See Figures	See Figures	See Figures
SSC: important to safety	None	None	None	None	Yes
SCC: post-fire safe shutdown	None	None	None	None	Yes
In situ Loading (Note 1)	a, c, d, g, j	a, b, d, e, g, w	a, b, c, e, g	a, c, d, g	a, b, c, d, e, g, j, k, t
Transient Fire Loading	THL-2	THL-1	THL-2	THL-2	THL-2
Common Ignition Source (Note 2a)	a, b, c, d, m	a, c	a, b, m	a, b, c, d	a, b, c, d, g, m, o, p
Atypical Ignition Sources (Note 2b)	None	ee	None	None	aa, ee
Hazard Classification (Note 13)	OH Group-1	OH Group-2	OH Group-1	OH Group-1	OH Group-2
Automatic Fire Detection	Yes	Yes	Yes	Yes	Yes (Hazard Specific) UPF03-001 Air Cooled Condenser Room 1 UPF03-002 Transformer Room 1 UPF02-001 UHS Makeup Water Pump Room 1 UPF02-003 Traveling Screen Room 1
Manual Fire Alarms	Yes	Yes	Yes	Yes	Yes
Automatic Fixed Fire Suppression	No	No	No	No	No
Manual Fixed Fire Suppression	No	No	No	No	No
Standpipe and Hose System (Note 7)	No	No	No	No	Yes
Portable Fire Extinguishers (Note 8)	Yes	Yes	Yes	Yes	Yes
Suppression Affects	Note 14	Note 14	Note 14	Note 14	Note 14
Plant Drains	Note 9	Note 9	Note 9	Note 9	Note 9
Radiological Affects	None	None	None	None	None
HVAC	Note 10	Note 10	Note 10	Note 10	Note 10
Emergency Lighting (Note 11)	aa	None	aa	aa	aa
Communication (Note 12)	Yes	Yes	Yes	Yes	Yes
Engineering Evaluations	None	None	None	None	Yes (Notes 6a &17)

Table 9B-2— {Fire Area Parameters}
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Column	36	37	38	39	40
Fire Area	FA-UPF-02	FA-UPF-03	FA-UPF-04	FA-UPF-05	FA-UPE-01
Building or Area	UPF	UPF	UPF	UPF	UPE
Figures	Figure 9B-23	Figure 9B-23	Figure 9B-23	Figure 9B-23	Figure 9B-24
Fire Barriers (Notes 3,4,5,6)	See Figures	See Figures	See Figures	See Figures	See Figures
SSC: important to safety	None	Yes	Yes	Yes	None
SCC: post-fire safe shutdown	None	Yes	Yes	Yes	None
In situ Loading (Note 1)	a, b, c, j	a, b, c, d, e, g, j, k, t	a, b, c, d, e, g, j, k, t	a, b, c, d, e, g, j, k, t	a, c, e, g
Transient Fire Loading	THL-2	THL-2	THL-2	THL-2	THL-2
Common Ignition Source (Note 2a)	a, m	a, b, c, d, g, m, o, p	a, b, c, d, g, m, o, p	a, b, c, d, g, m, o, p	a, b, m
Atypical Ignition Sources (Note 2b)	aa	aa, ee	aa, ee	aa, ee	None
Hazard Classification (Note 13)	OH Group-1	OH Group-2	OH Group-2	OH Group-2	OH Group-1
Automatic Fire Detection	Yes (Hazard Specific) UPF03-003 Personnel Access to Electrical Rooms UPF02-002 Personnel Access to Pump Rooms	Yes (Hazard Specific) UPF03-004 Air Cooled Condenser Room 2 UPF03-005 Transformer Room 2 UPF02-004 UHS Makeup Water Pump Room 2 UPF02-005 Traveling Screen Room 2	Yes (Hazard Specific) UPF03-006 Air Cooled Condenser Room 3 UPF03-007 Transformer Room 3 UPF02-006 UHS Makeup Water Pump Room 3 UPF02-007 Traveling Screen Room 3	Yes (Hazard Specific) UPF03-008 Air Cooled Condenser Room 4 UPF03-009 Transformer Room 4 UPF02-008 UHS Makeup Water Pump Room 4 UPF02-009 Traveling Screen Room 4	Yes
Manual Fire Alarms	Yes	Yes	Yes	Yes	Yes
Automatic Fixed Fire Suppression	No	No	No	No	No
Manual Fixed Fire Suppression	No	No	No	No	No
Standpipe and Hose System (Note 7)	Yes	Yes	Yes	Yes	No
Portable Fire Extinguishers (Note 8)	Yes	Yes	Yes	Yes	Yes
Suppression Affects	Note 14	Note 14	Note 14	Note 14	Note 14

Table 9B-2— {Fire Area Parameters}
(Page 13 of 19)

Column	36	37	38	39	40
Plant Drains	Note 9	Note 9	Note 9	Note 9	Note 9
Radiological Affects	None	None	None	None	None
HVAC	Note 10	Note 10	Note 10	Note 10	Note 10
Emergency Lighting (Note 11)	aa	aa	aa	aa	aa
Communication (Note 12)	Yes	Yes	Yes	v	Yes
Engineering Evaluations	Yes (Notes 6a & 17)	Yes (Notes 6a & 17)	Yes (Notes 6a & 17)	Yes (Notes 6a & 17)	None

Table 9B-2— {Fire Area Parameters}
(Page 14 of 19)

Column	41	42			
Fire Area	FA-UPE-02	FA-UPQ-01			
Building or Area	UPE	UPQ			
Figures	Figure 9B-24	Figure 9B-25			
Fire Barriers (Notes 3,4,5,6)	See Figures	See Figures			
SSC: important to safety	None	None			
SCC: post-fire safe shutdown	None	None			
In situ Loading (Note 1)	a, c, d, g	a, c, d, e, g, k			
Transient Fire Loading	THL-2	THL-2			
Common Ignition Source (Note 2a)	a, b, c, d	a, b, c, d			
Atypical Ignition Sources (Note 2b)	ee	None			
Hazard Classification (Note 13)	OH Group-1	OH Group-1			
Automatic Fire Detection	Yes	Yes (Note 15)			
Manual Fire Alarms	Yes	Yes			
Automatic Fixed Fire Suppression	No	Yes (Note 15)			
Manual Fixed Fire Suppression	No	No			
Standpipe and Hose System (Note 7)	No	No			
Portable Fire Extinguishers (Note 8)	Yes	Yes			
Suppression Affects	Note 14	Note 14			
Plant Drains	Note 9	Note 9			
Radiological Affects	None	None			
HVAC	Note 10	Note 10			
Emergency Lighting (Note 11)	aa	aa			
Communication (Note 12)	Yes	Yes			
Engineering Evaluations	None	None			

Table 9B-2— {Fire Area Parameters}
(Page 15 of 19)

Column	41	42			

Notes
1. In-situ Loading:

a. Miscellaneous Cable Insulation
b. Miscellaneous Plastic and Rubber
c. Miscellaneous Wire and Plastic Components (Panels)
d. Lubricants and Hydraulic Fluids
e. Electrical Cabinets
f. Flammable Gases (Hydrogen)
g. Electrical Cable Insulation (Cable Trays)
h. Charcoal (Filters)
i. Air Compressors
j. HVAC Subsystem Components
k. Transformers (Dry)
l. Transformers (Oil-filled)
m. Battery Cases
n. Diesel Fuel Oil
o. Paints, Solvents and Cleaning Fluids
p. Clothing (Cotton and Synthetic Blends)
q. Clothing (Rubber and Plastic)
r. Paper Records, Procedures and Files
s. Furniture and/or Appliances
t. Air Handling Units
u. Flammable Gases (Methane)
v. Battery Chargers

Table 9B-2— {Fire Area Parameters}
(Page 16 of 19)

Column	41	42			
2a. Common Ignition Sources: a. Low to Medium Voltage Electrical Circuits b. General Electrical and Control Cabinets c. Electric Motors d. Pumps e. Air Compressors f. Indoor Oil-filled Transformers g. Electrical Switchgear Cabinets h. Reactor Protection System MG sets i. Diesel Generators j. Battery Banks k. Boiler Heating Units l. Electric Dryers m. HVAC subsystem components n. Low Voltage Electrical Circuits o. Air Handling Units p. Transformers (Dry)					

Table 9B-2— {Fire Area Parameters}
(Page 17 of 19)

Column	41	42			

2b. Atypical Ignition Sources:
- aa. Arcing Electrical Faults
- bb. Hydrogen Storage Tanks
- cc. Hydrogen Piping
- dd. T/G Exciter / Hydrogen
- ee. Liquid Fuels (spills)
- ff. Outdoor Oil-filled Transformers

3. Barrier Ratings: See "Fire Barrier Location" located on the Fire Area Layout Drawings

4. Doors:
   - ♦ For 1 hour fire rated barriers, minimum 1 hour fire rated door assemblies are provided.
   - ♦ For 2 hour fire rated barriers, minimum 1.5 hour fire rated door assemblies are provided.
   - ♦ For 3 hour fire rated barriers, minimum 3 hour fire rated door assemblies are provided.

5. Dampers:
   - ♦ For 1 hour fire rated barriers, minimum 1 hour fire rated dampers are provided, except where through duct configuration is suitable to satisfy NFPA 90A (NFPA, 2002) requirements to allow for dampers to be omitted.
   - ♦ For 2-hour fire rated barriers, minimum 1.5-hour fire rated dampers are provided.
   - ♦ For 3-hour fire rated barriers, minimum 3-hour fire rated dampers are provided.

6. Penetrations:
Penetrations through fire rated walls, floors, and ceilings of each fire area are sealed or otherwise closed with rated penetration seal assemblies except where seal omission is permitted by NFPA code/standard. Any non-rated penetrations through rated barriers in this fire area will be justified by engineering evaluations.

6a. During detailed design, an engineering evaluation shall be performed to justify the open floor trench penetrations through the 3 hour rated fire barriers separating fire areas FA-UPF-01, FA-UPF-03, FA-UPF-04 and FA-UPF-05 (rooms UPF02-003, UPF02-005, UPF02-007, and UPF02-009) and the debris basin.

7. Unless noted otherwise, a "Yes" indicates that Class III standpipes and hose stations are available for fire fighting use, but may not be located within the fire area.

7a. One and a half inch hose connections shall be provided in lieu of the Class III standpipes and hose connections.

Table 9B-2— {Fire Area Parameters}
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Column	41	42			

8. Portable Fire Extinguishers:
Portable fire extinguishers may not necessarily be located in each individual fire area; however, they are available throughout each building to support manual fire fighting activities in accordance with NFPA requirements.

9. Plant Drains:
Drainage to be determined during detailed design. Drains will be provided except where storage of hazardous materials and/or radiological contamination imposes requirements for confinement and/or secondary containment.

10. HVAC:
Duct smoke detection and fan interlock will be provided when required by NFPA 90A.

11. Emergency Lighting:

aa. self-contained, battery backed fixtures installed throughout the fire area which provide minimum illumination for a 90 minute period to ensure a safe access/egress path in the event of a loss of the normal lighting system.

12. Communication:
One or more of the following methods of communication are available: plant-wide public address/paging system, in-plant telephone system, external communication links to the outside world, and/or portable radio communications.

13. Hazard Classification:
See Section 9B.2.2 for definition of hazard classifications.
- Light Hazard
- Ordinary Hazard (OH Group-1)
- Ordinary Hazard (OH Group-2)
- Extra Hazard (EH Group-1)
- Extra Hazard (EH Group-2)

14. Suppression Affects:
No adverse affects from automatic suppression systems are anticipated based on selected suppression agents and systems, on the absence of important to safety SSCs in the area or room of concern, and/or on the absence of important to safety SSCs susceptible to damage in the area or room of concern. This will require confirmation after final room/area, suppression system and important to safety SSC configuration/layout.

Table 9B-2— {Fire Area Parameters}
(Page 19 of 19)

Column	41	42			

15. Water Reactive Chemicals
The Water Treatment Building will be provided with full area sprinkler protection, except for secondary containment areas associated with the tank storage of water reactive chemicals. These areas will be provided with automatic fire detection in accordance with the provisions of the IBC.

16. Manual pull stations may not necessarily be located in each individual fire area; however, they are located in accordance with NFPA requirements.

17. During detailed design, an engineering evaluation shall be performed to confirm the inability of smoke and hot gases to migrate into other fire areas to the extent that they could adversely affect safe-shutdown capabilities, including operator actions.

Figure 9B-1— {CCNPP Unit 3 Fire Barrier Location, Turbine Building Plan at Elevation (-)23 Feet}

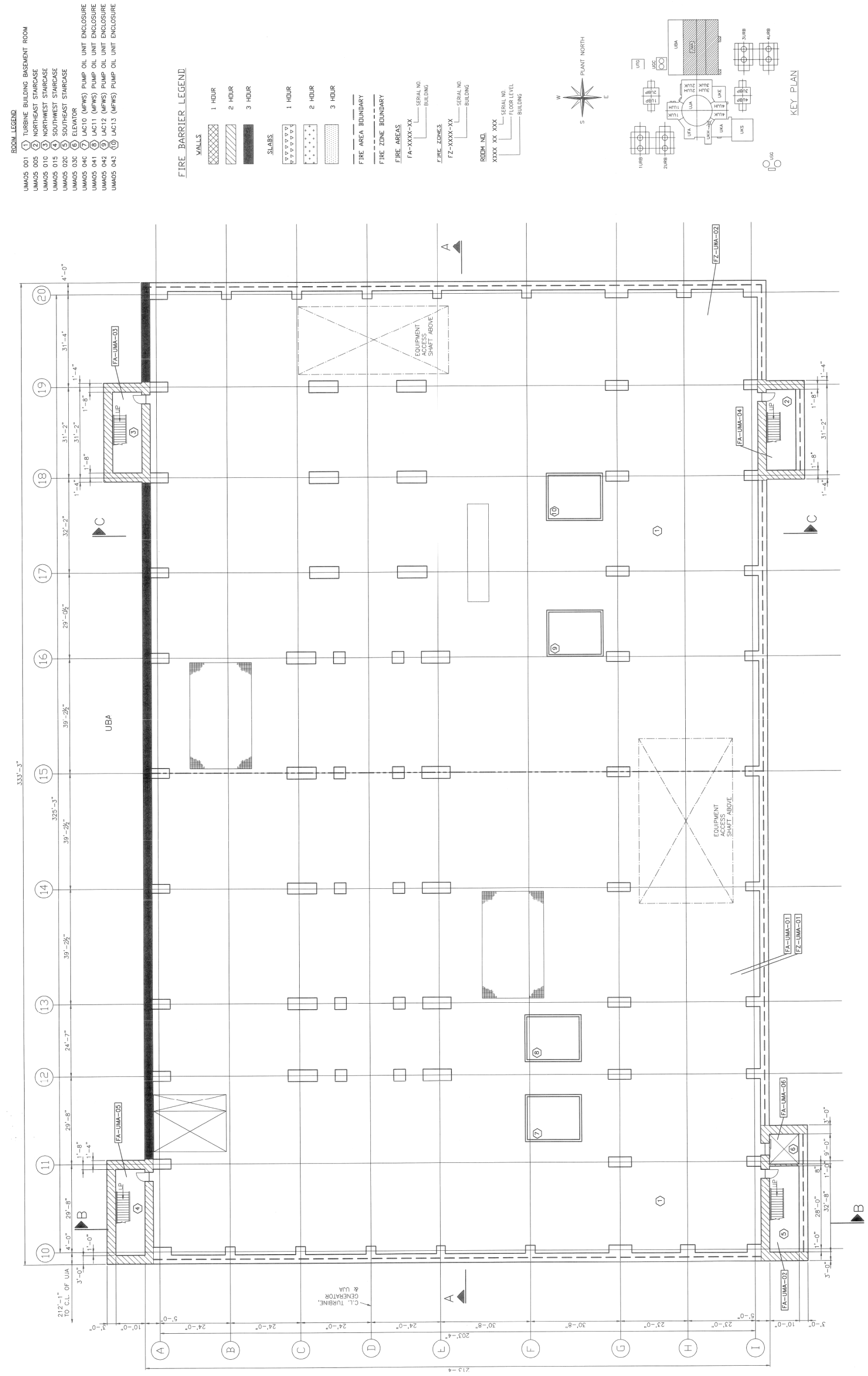
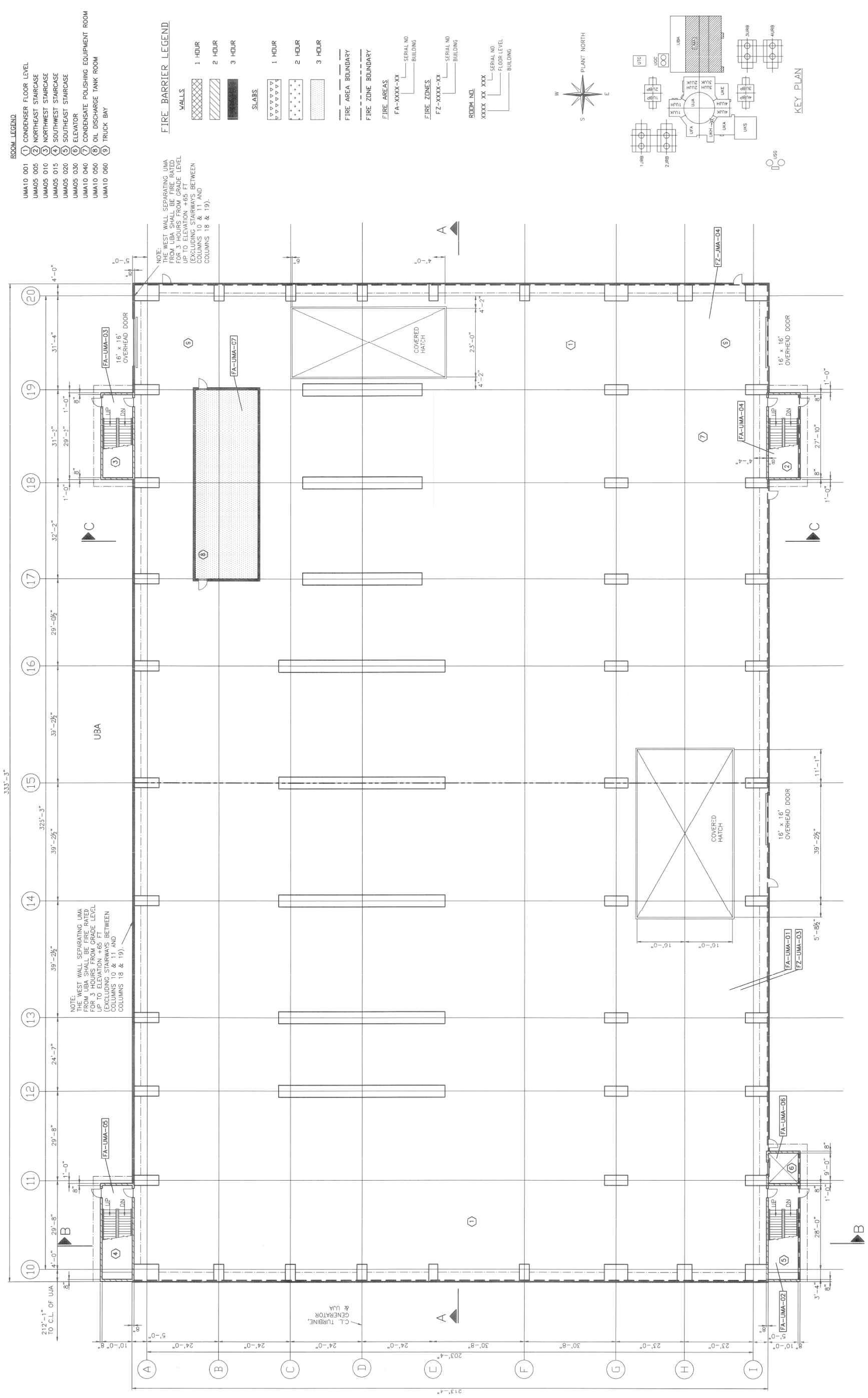


Figure 9B-2— {CCNPP Unit 3 Fire Barrier Location, Turbine Building Plan at Elevation +/- 0 Feet}



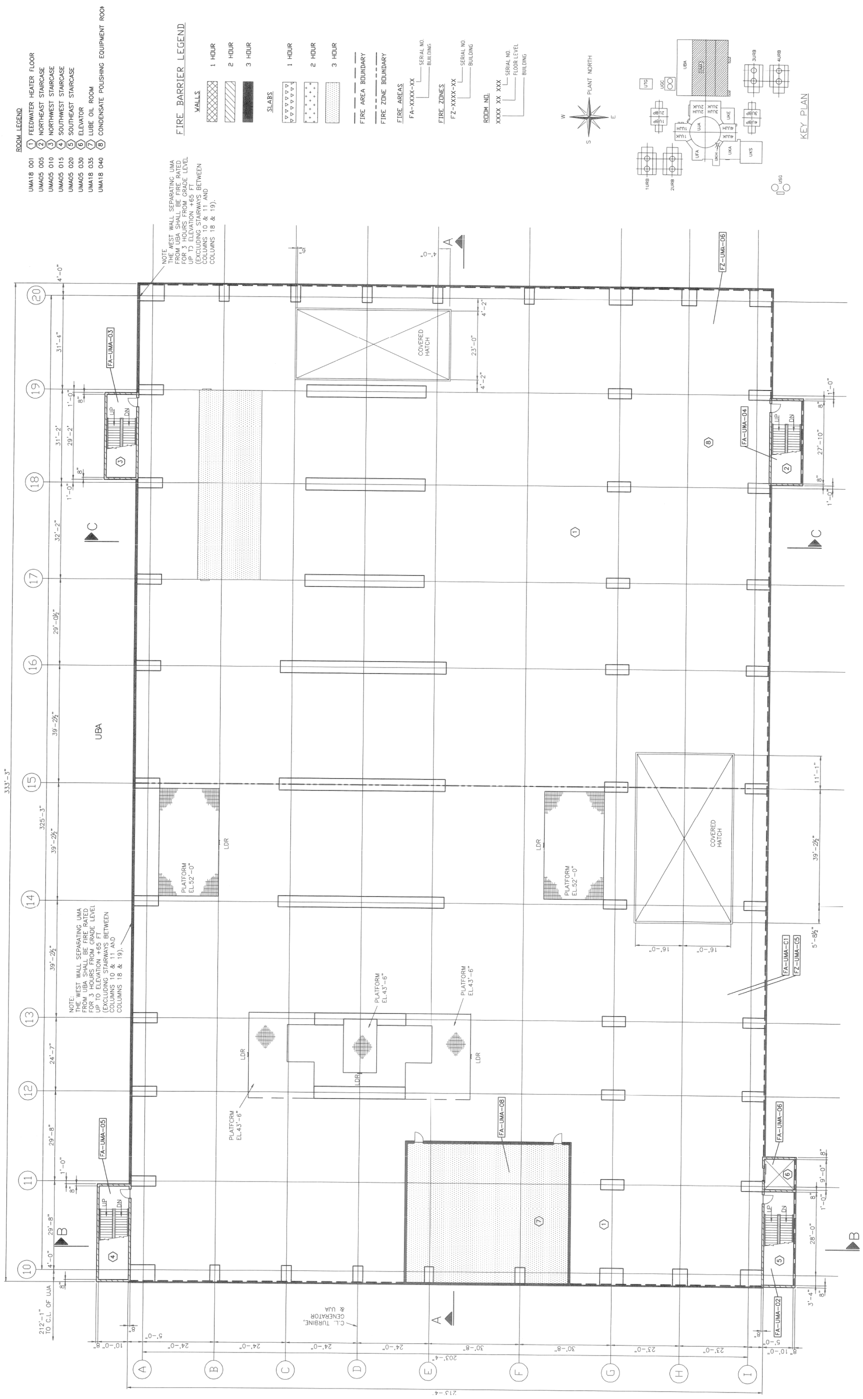


Figure 9B-3— {CCNPP Unit 3 Fire Barrier Location, Turbine Building Plan at Elevation +38 Feet}

Figure 9B-4— {CCNPP Unit 3 Fire Barrier Location, Turbine Building Plan at Elevation +65 Feet}

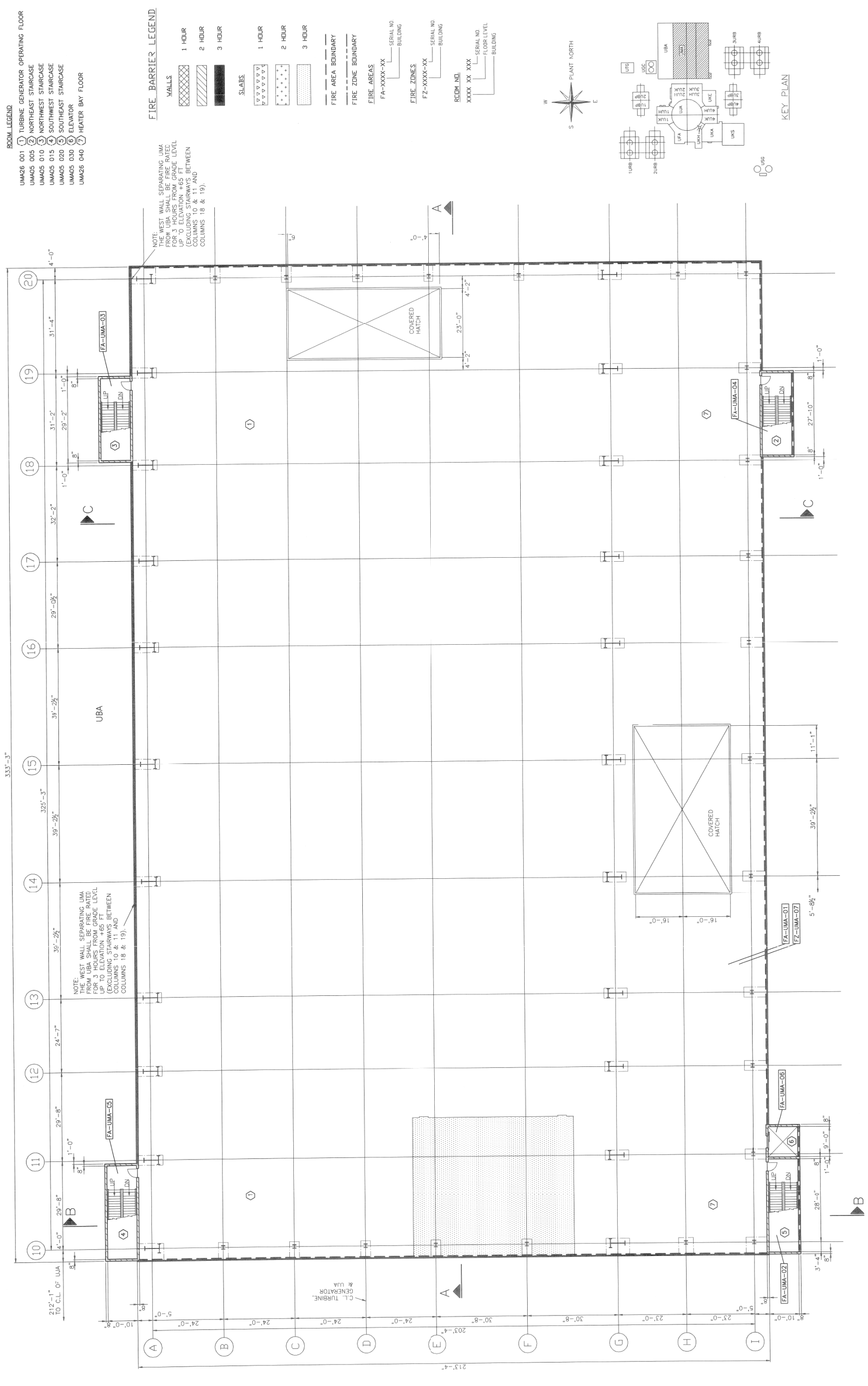
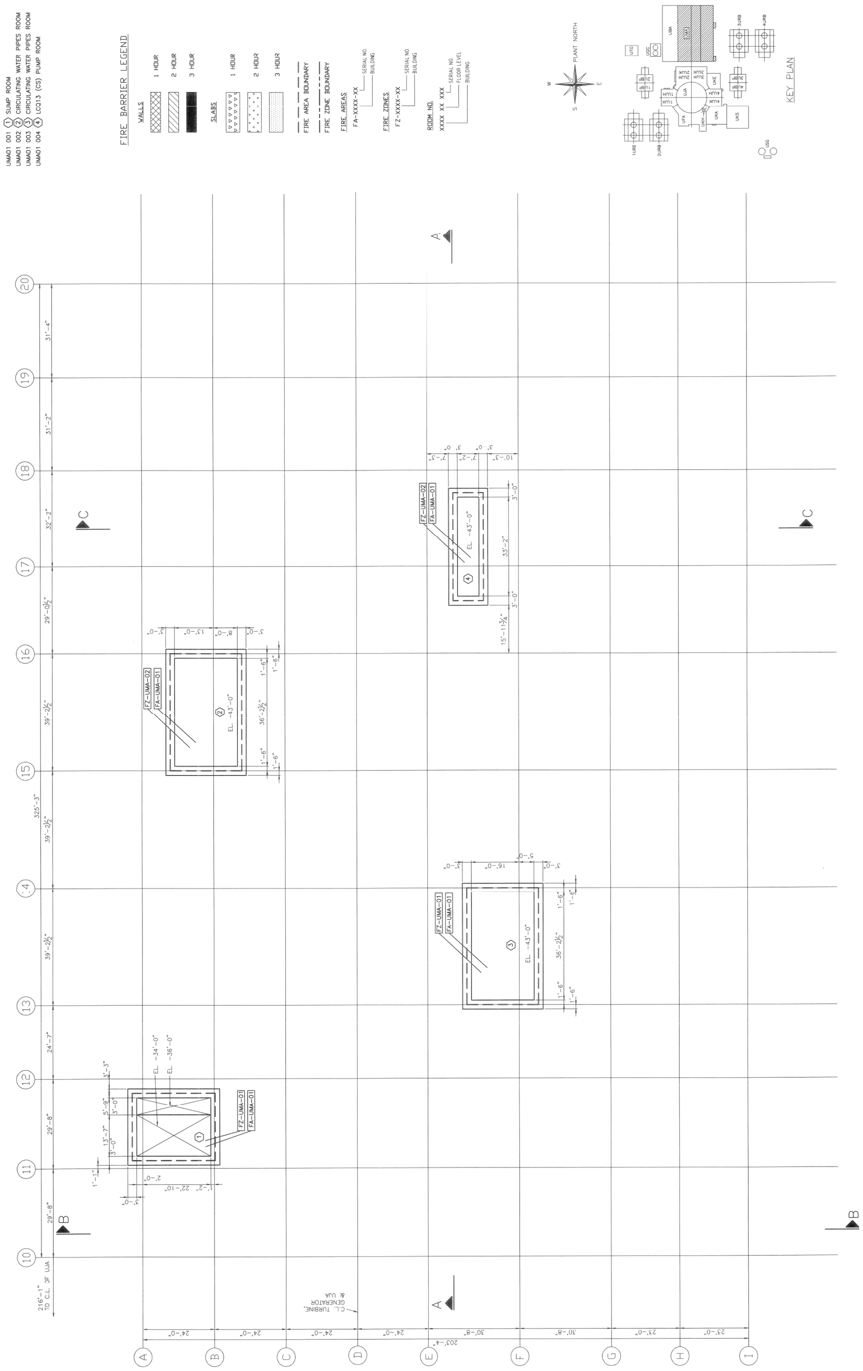


Figure 9B-5— {CCNPP Unit 3 Fire Barrier Location, Turbine Building Plan at Elevation (-)43 Feet}



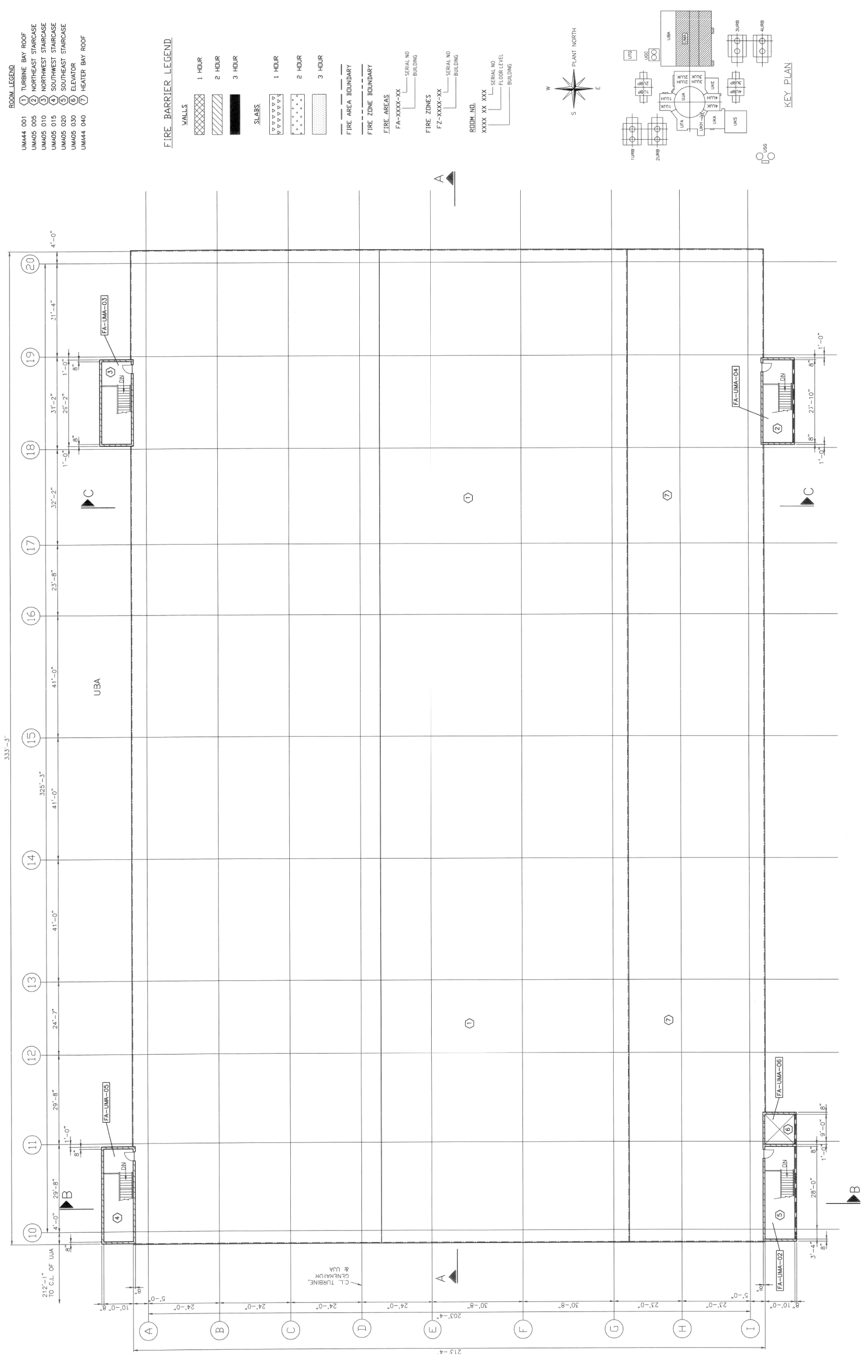
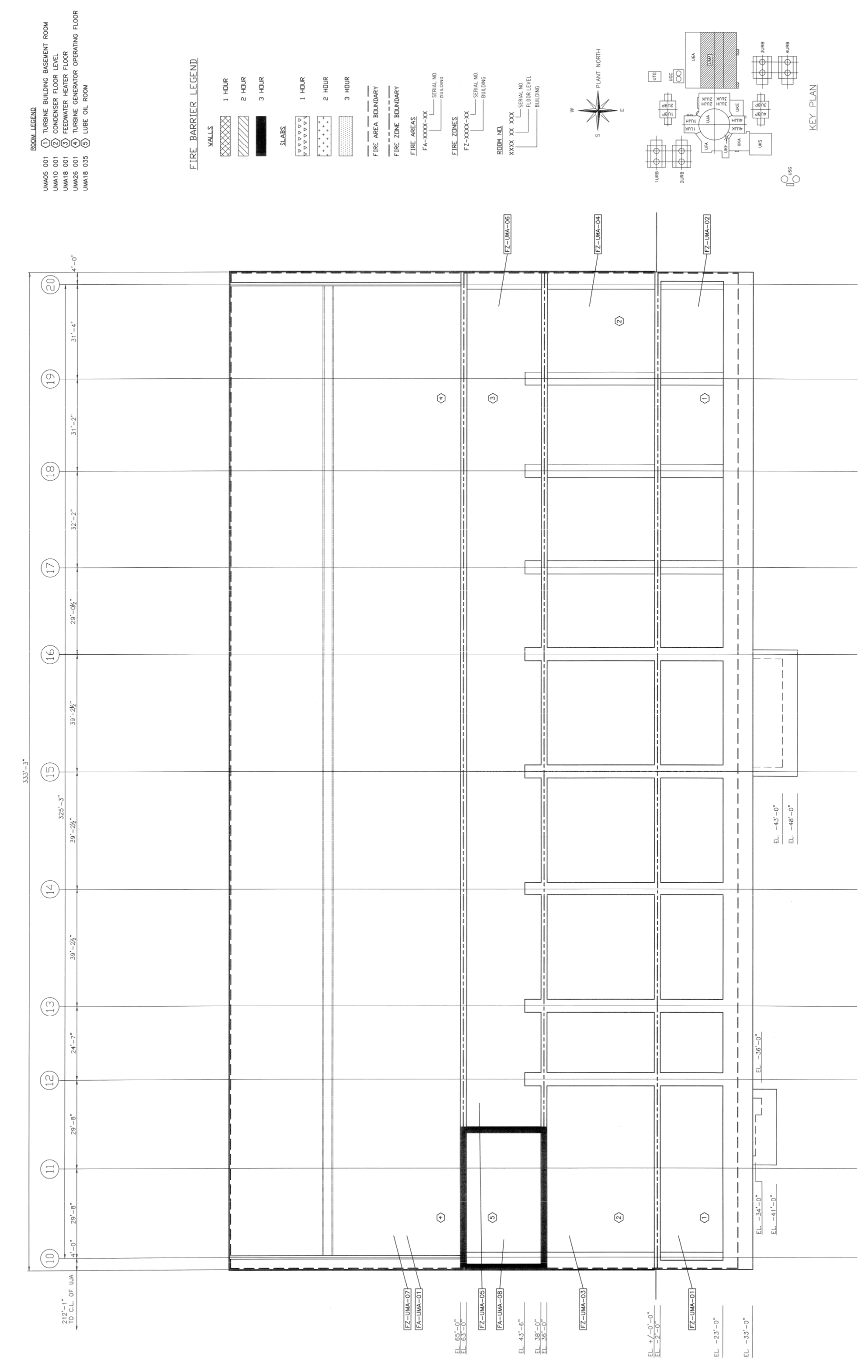


Figure 9B-6— {CCNPP Unit 3 Fire Barrier Location, Turbine Building Roof Plan}

Figure 9B-7— {CCNPP Unit 3 Fire Barrier Location, Turbine Building Section A-A}



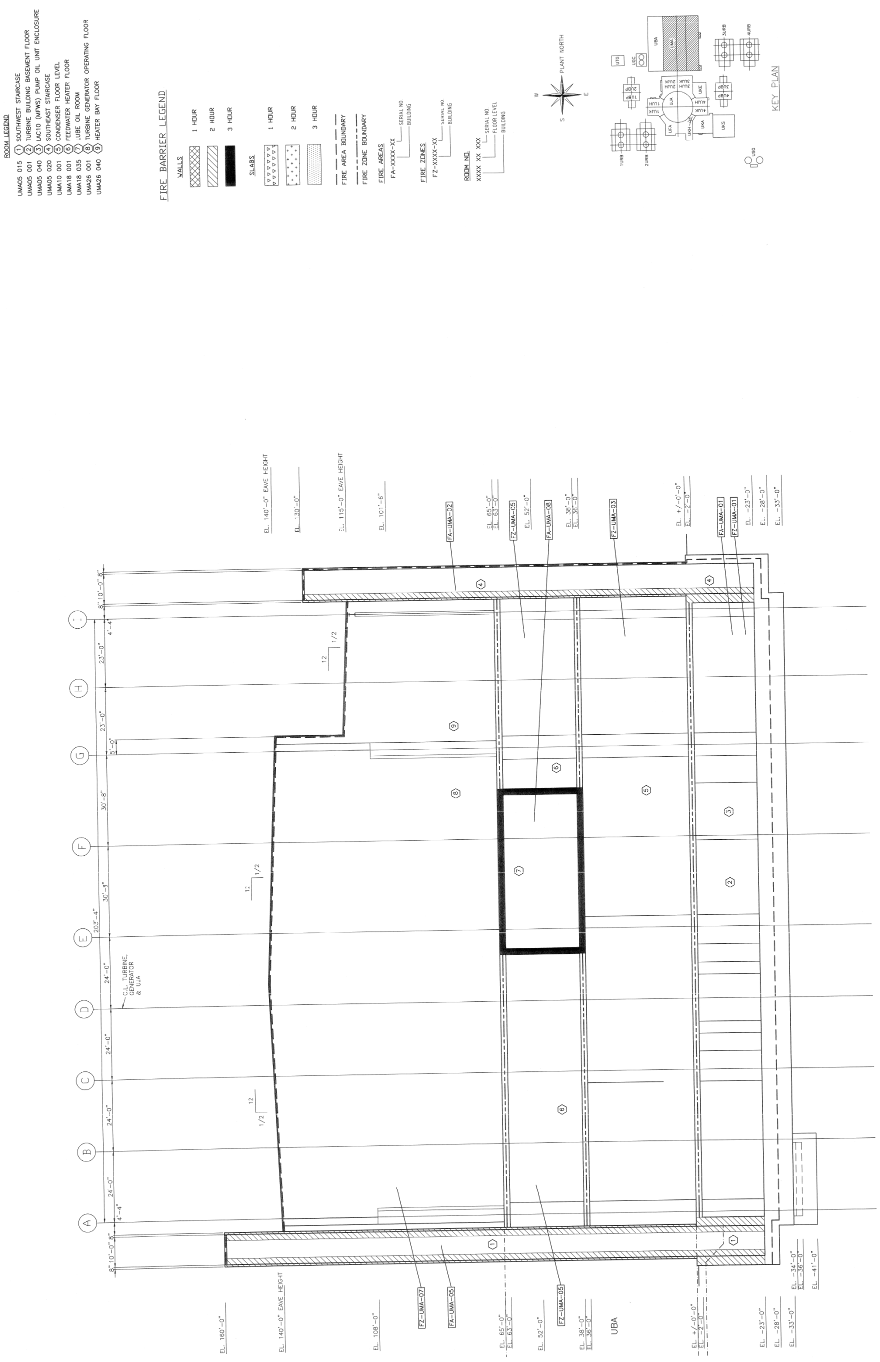


Figure 9B-8— {CCNPP Unit 3 Fire Barrier Location, Turbine Building Section B-B}

Figure 9B-9— {CCNPP Unit 3 Fire Barrier Location, Turbine Building Section C-C}

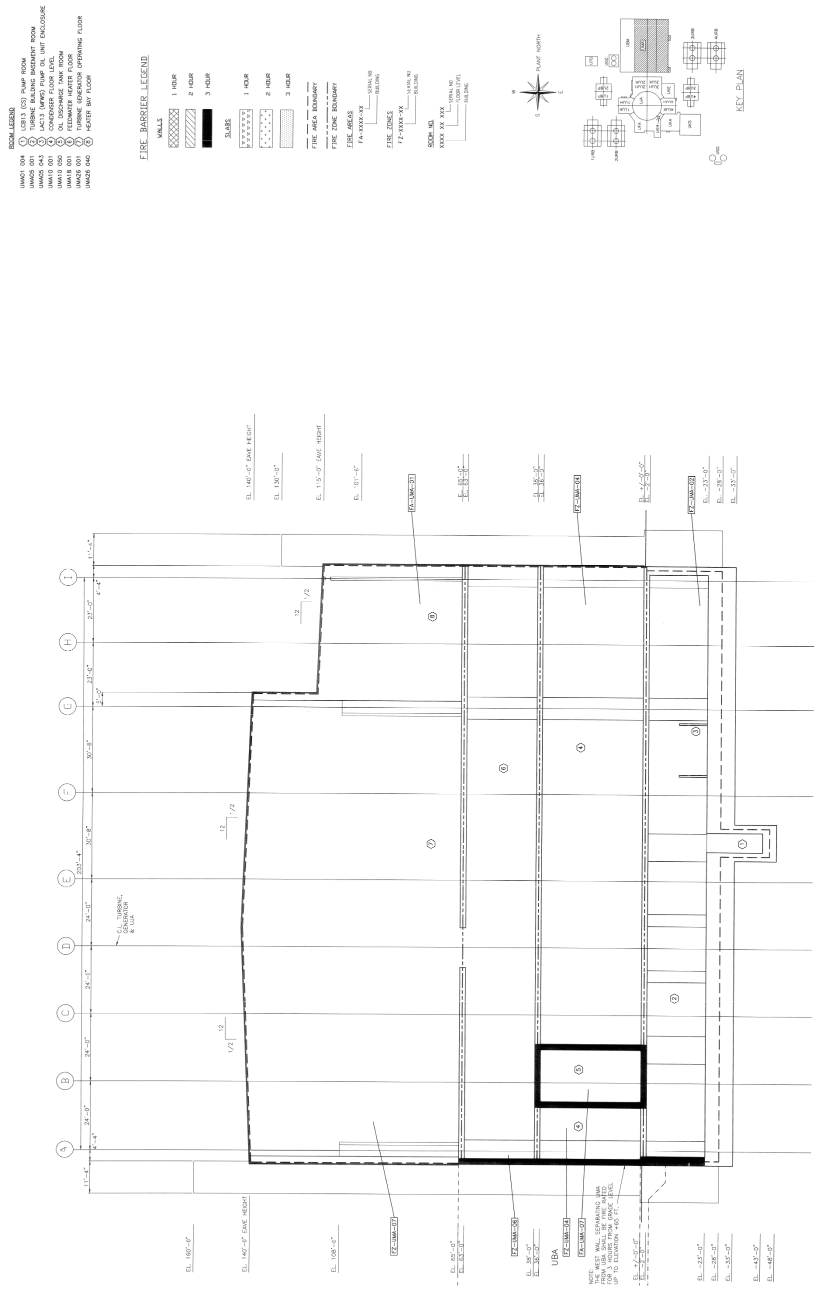


Figure 9B-10— {CCNPP Unit 3 Fire Barrier Location, SWGR/SBO Buildings Plan View at Elevation (-)13'-0"}

[Security related information - Withheld under 10 CFR 2.390 — See Part 9 of the COL Application.]

Figure 9B-11— {CCNPP Unit 3 Fire Barrier Location, SWGR/SBO/AUX BLR Buildings Plan View at Elevation 0'-0"}

[[Security related information - Withheld under 10 CFR 2.390 — See Part 9 of the COL Application.]

Figure 9B-12— {CCNPP Unit 3 Fire Barrier Location, SWGR/SBO/AUX BLR Buildings Plan View at Elevation 13'-0"}

[Security related information - Withheld under 10 CFR 2.390 — See Part 9 of the COL Application.]

Figure 9B-13— {CCNPP Unit 3 Fire Barrier Location, SWGR/SBO/AUX BLR Buildings Plan View at Elevation 24'-6"}

[Security related information - Withheld under 10 CFR 2.390 — See Part 9 of the COL Application.]

Figure 9B-14— {CCNPP Unit 3 Fire Barrier Location, SWGR/SBO/AUX BLR Buildings, Plan View Section A-A}

[Security related information - Withheld under 10 CFR 2.390 — See Part 9 of the COL Application.]

Figure 9B-15— {CCNPP Unit 3 Fire Barrier Location, Transformer Area Plan View at Elevation 0'-0"}

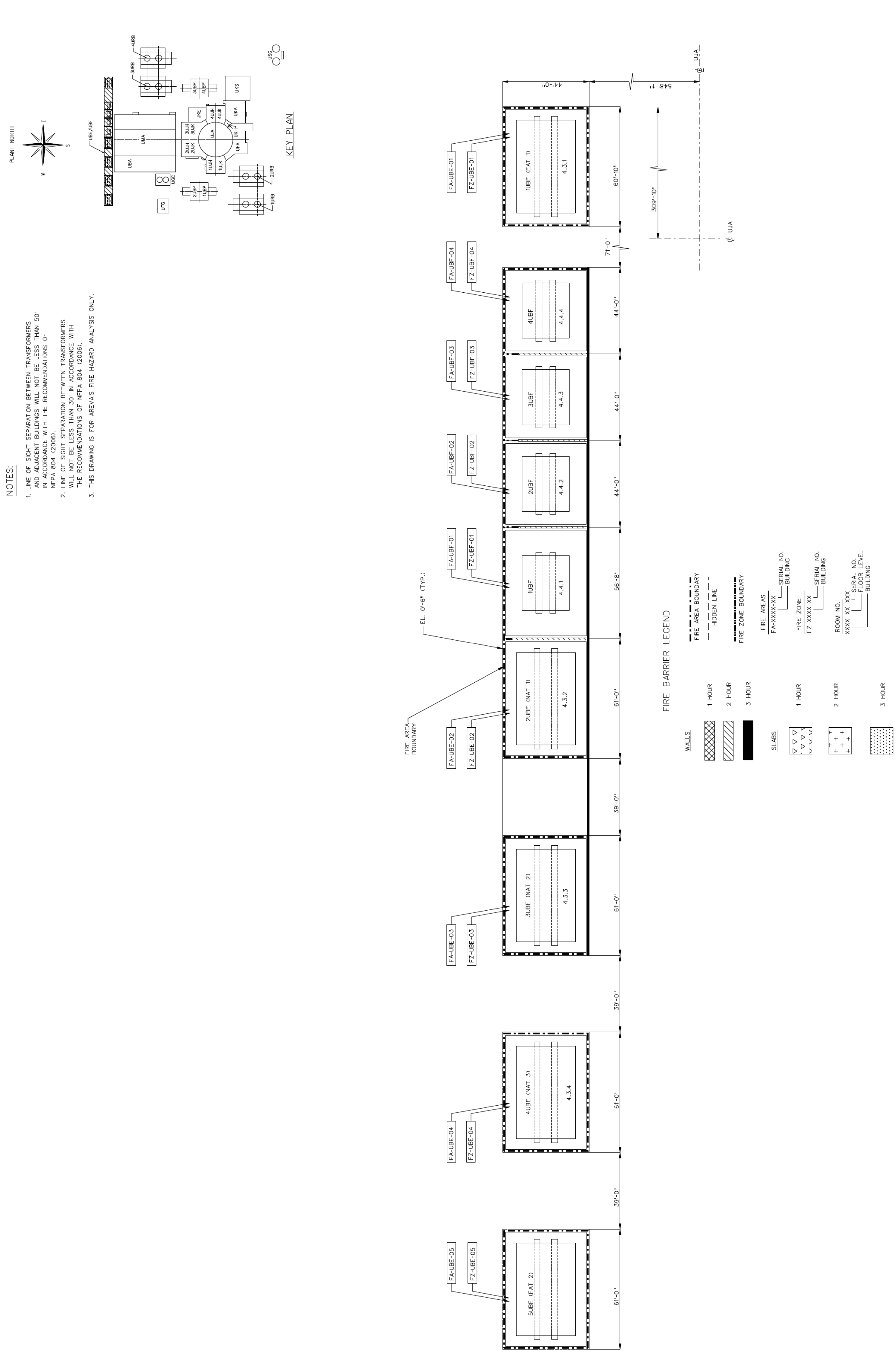
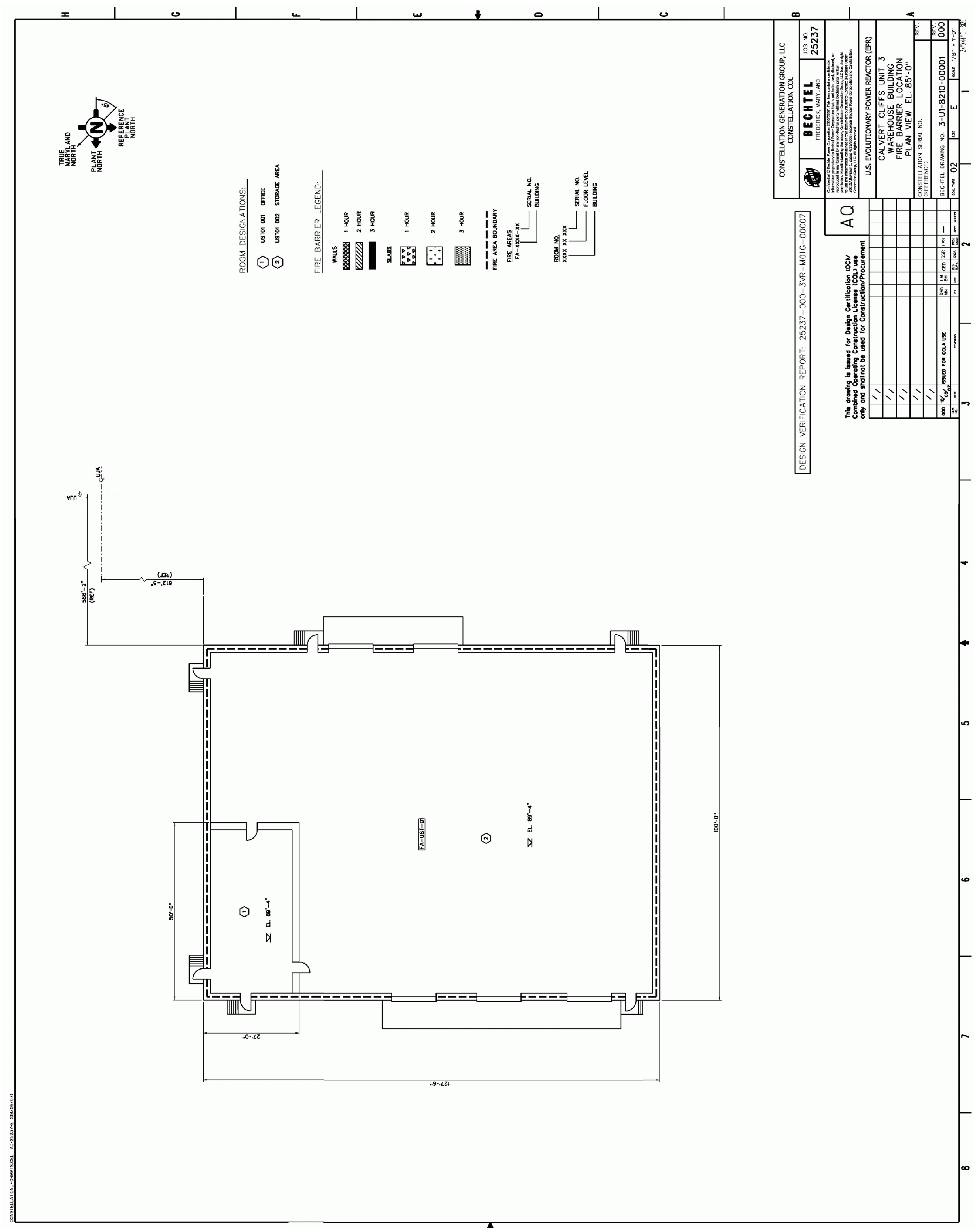


Figure 9B-16— {CCNPP Unit 3 Fire Barrier Location, Warehouse Building Plan View at Elevation 85'-0"}



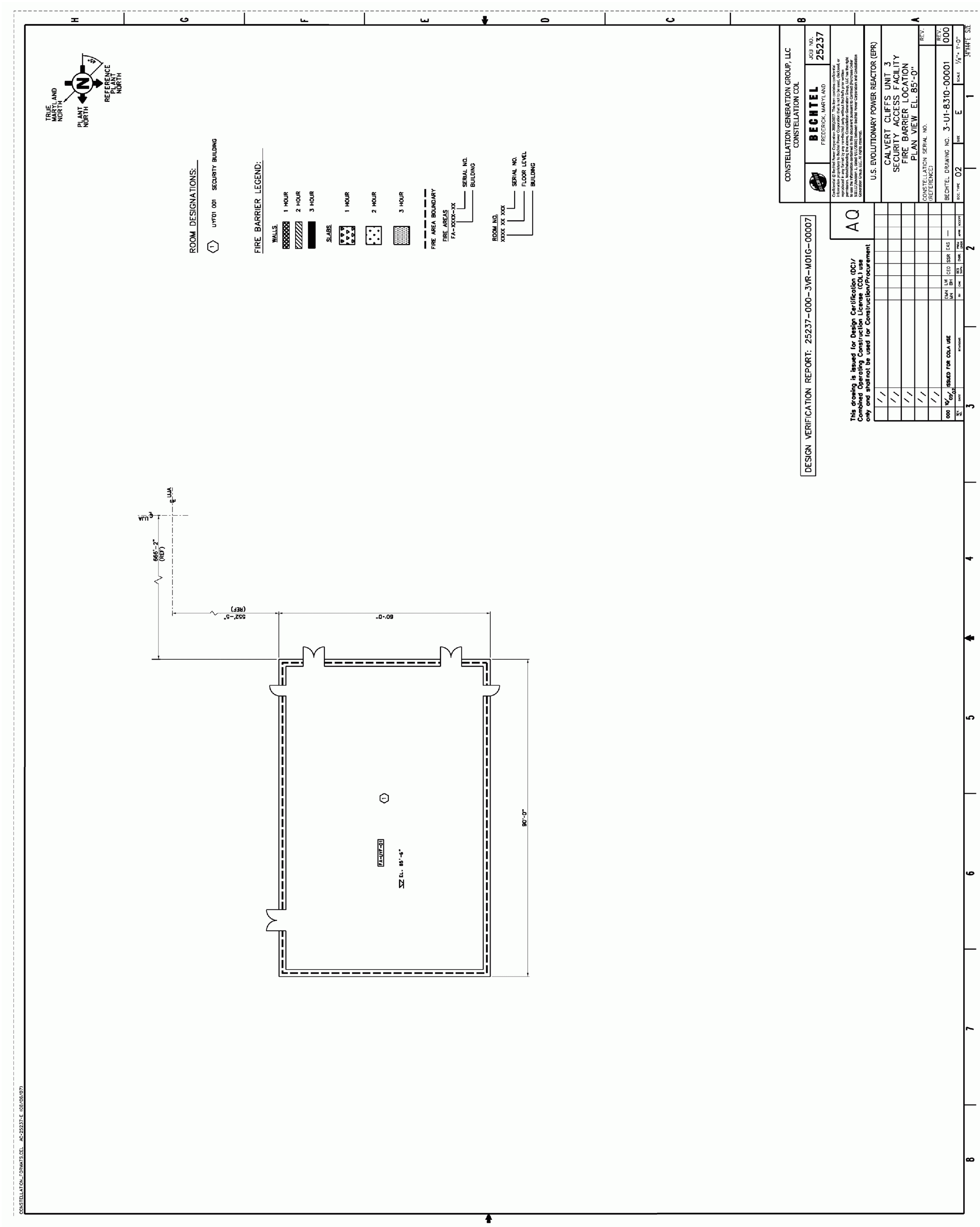


Figure 9B-17— {CCNPP Unit 3 Fire Barrier Location, Security Access Facility Plan View at Elevation 85'-0"}

Figure 9B-18— {CCNPP Unit 3 Fire Barrier Location, Central Gas Supply Building Plan View at Elevation 85'0"}

[Security related information - Withheld under 10 CFR 2.390 — See Part 9 of the COL Application.]

Figure 9B-19— {CCNPP Unit 3 Fire Barrier Location, Grid Systems Control Building Plan View at Elevation 85'0"}

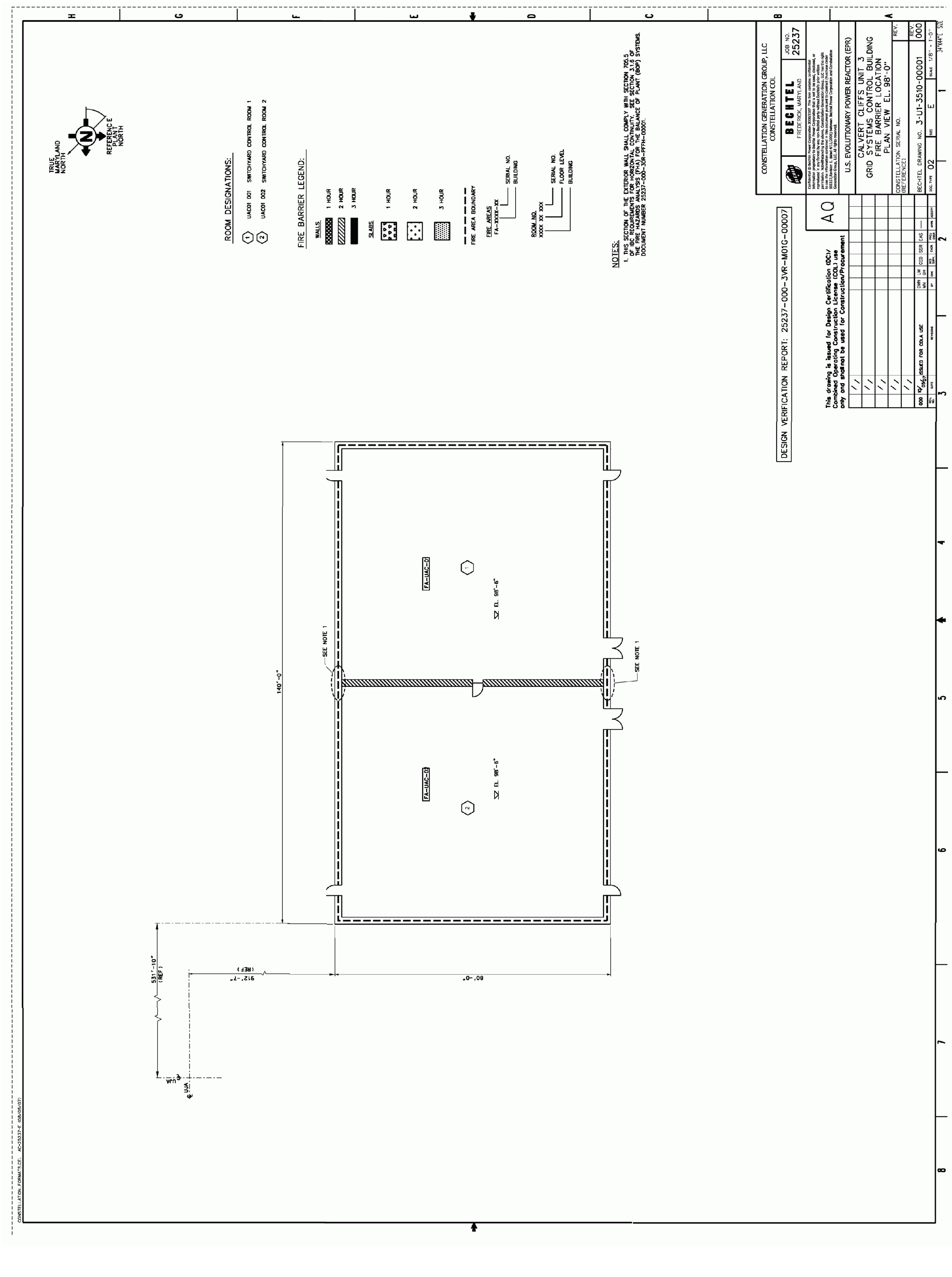


Figure 9B-20— {CCNPP Unit 3 Fire Barrier Location, Fire Protection Building Plan View at Elevation 85'0"}

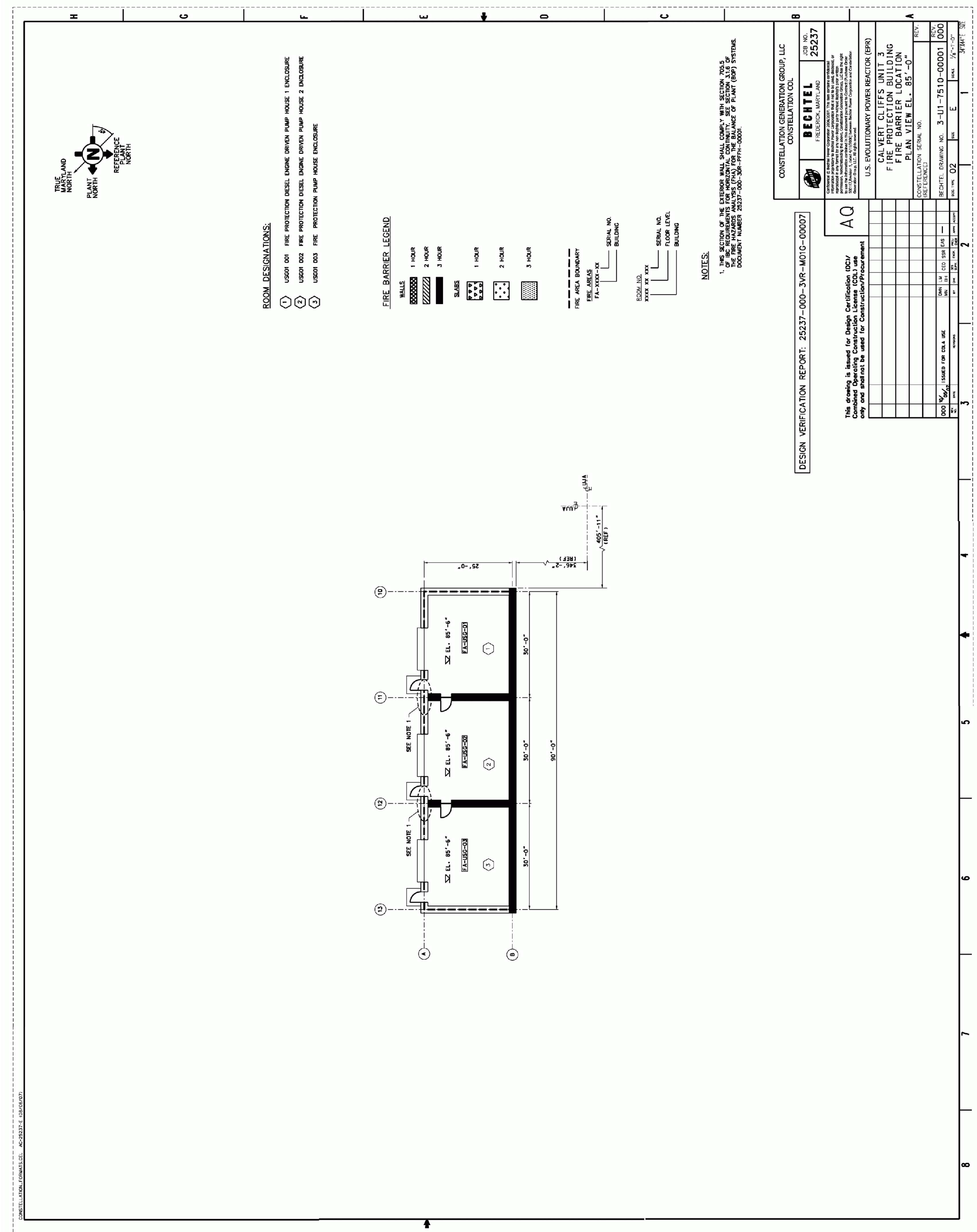


Figure 9B-21— {CCNPP Unit 3 Fire Barrier Location, Cooling Tower Structure, Plan View and Section A-A}

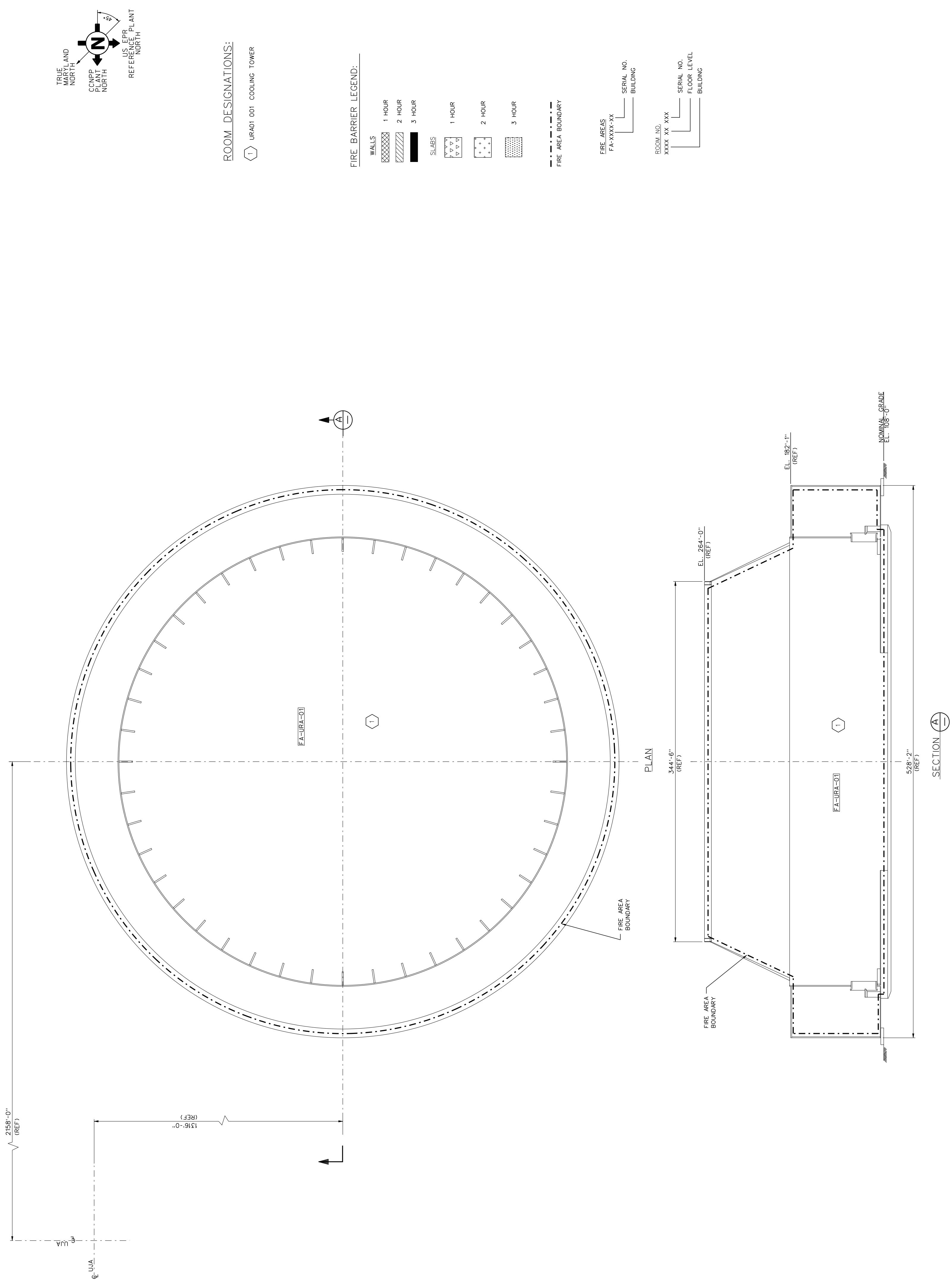


Figure 9B-22— {CCNPP Unit 3 Fire Barrier Location, Circulating Water Pump Building, Plan View and Section A-A}

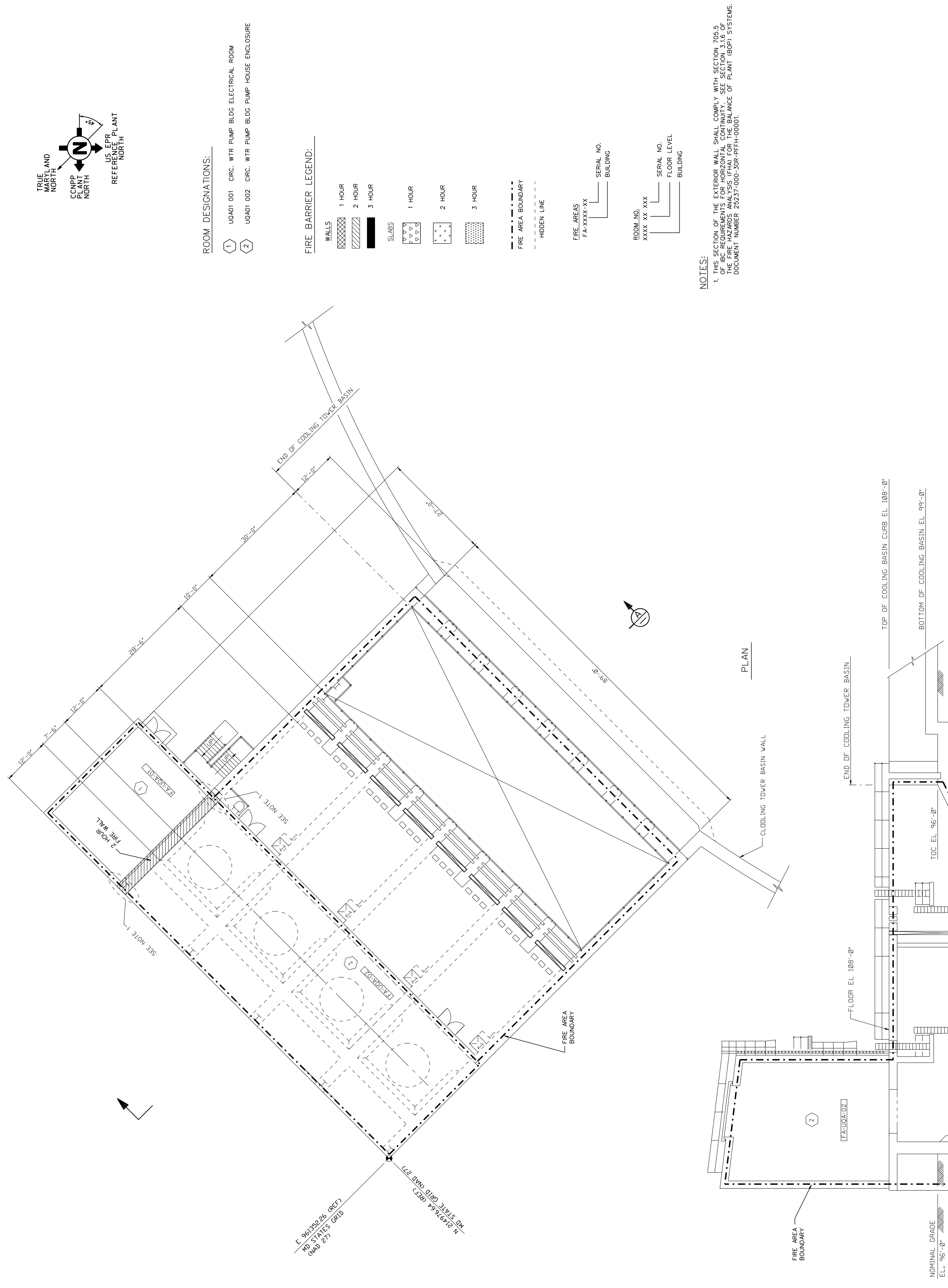


Figure 9B-23— {CCNPP Unit 3 Fire Barrier Location, UHS Makeup Water Intake Structure, Plan View and Section A-A}

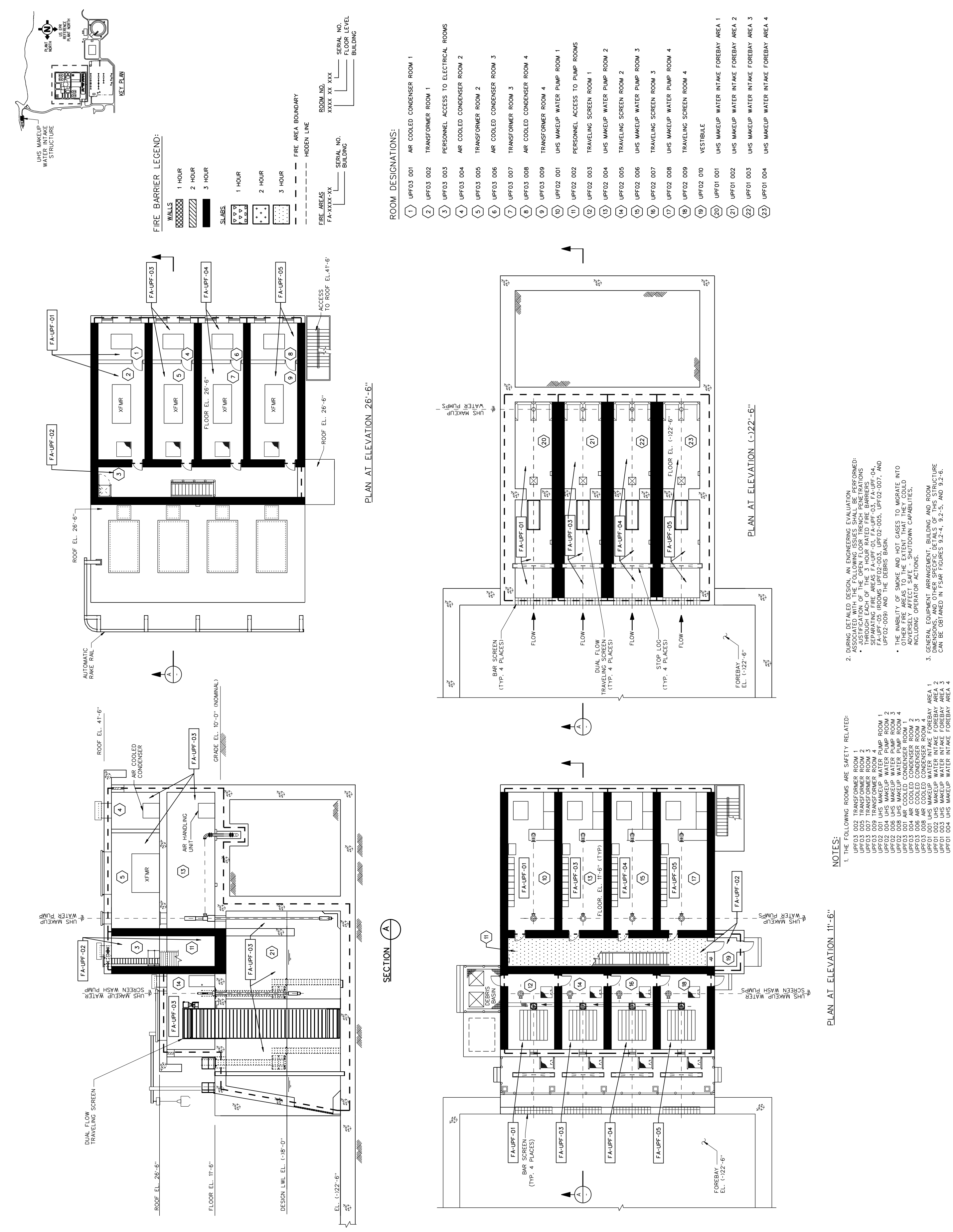


Figure 9B-24— {CCNPP Unit 3 Fire Barrier Location, CW Makeup IntakeStructure, Plan View and Section A-A}

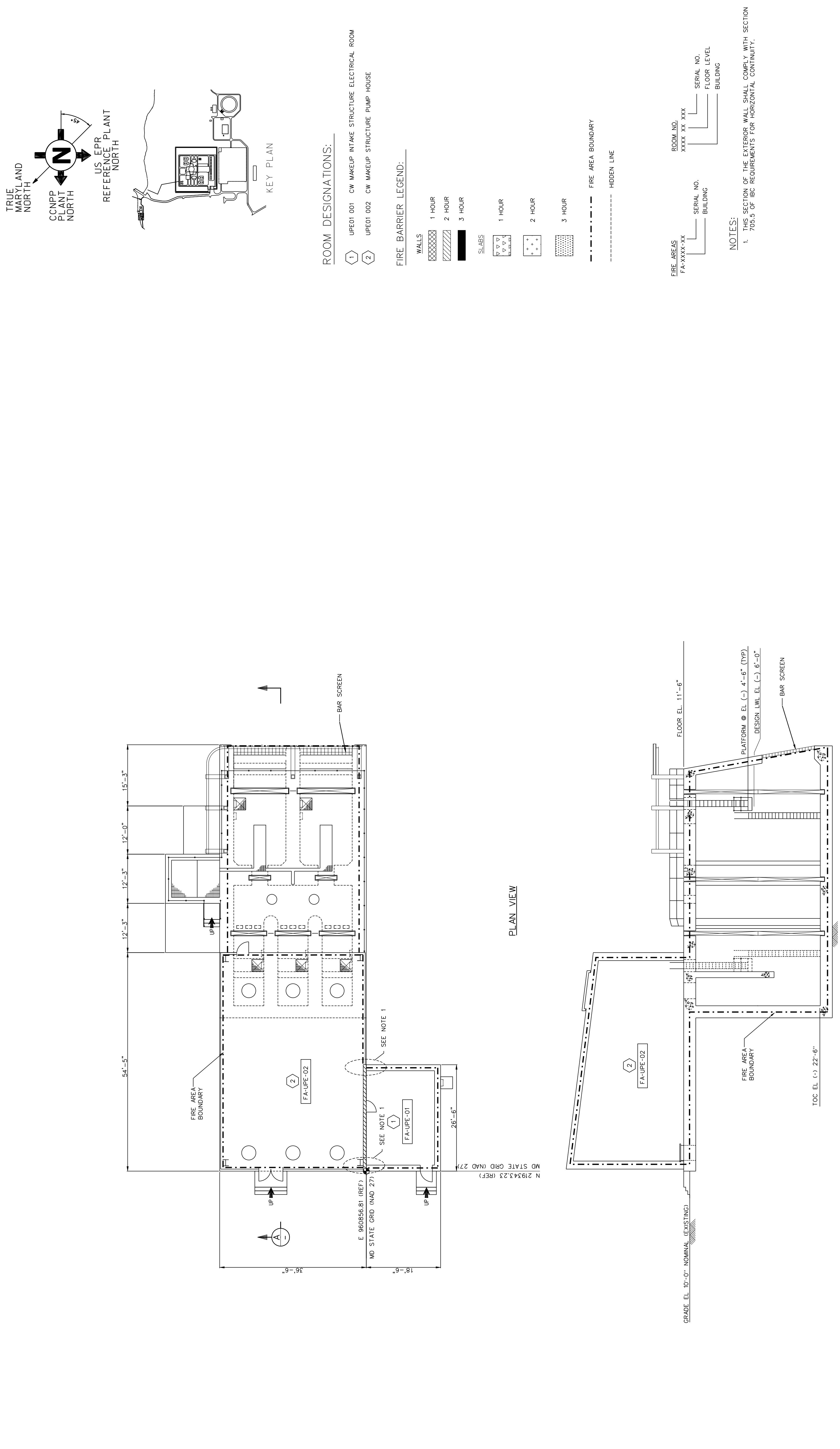


Figure 9B-25— {CCNPP Unit 3 Fire Barrier Location, Desalinization / Water Treatment Building Plan View at Elevation 100'0"}