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CHAPTER 9 AUXILIARY SYSTEMS

9.1 FUEL STORAGE AND HANDLING

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

9.1.3.1.3.1 Partial Core

Add the following information at the end of the third bullet in DCD Subsection 9.1.3.1.3.1.

PTN DEP 2.0-3

SFS performance following restart after a normal refueling is affected by a change in maximum safety wet bulb temperature. Calculations confirm that spent fuel pool temperature remains below 115°F with a CCS supply temperature of 97°F at the specified spent fuel pool loading condition and decay time on the fuel fraction just replaced during the previous 17-day refueling outage.

While the maximum CCS temperature expected for Turkey Point Units 6 & 7 is 97.4°F, an increase of 0.4°F in CCS supply temperature will produce a similar increase in the spent fuel pool maximum temperature; therefore, the requirement to maintain spent fuel temperature below 120°F is met with margin.

9.1.3.7 Instrumentation Requirements

Add the following paragraph after the first paragraph of DCD Subsection 9.1.3.7.D.

All three safety-related spent fuel pool level instruments and associated instrument tubing lines are located below the fuel handling area operating deck and the cask washdown pit. This location provides protection from missiles that may result from damage to the structure over the spent fuel pool. The SFP level instruments associated with PMS divisions A and C are physically separated from the SFP level instrument associated with PMS division B. The safety-related spent fuel pool level instruments measure the water level from the top of the spent fuel pool to the top of the fuel racks. These instruments are conservatively calibrated at a reference temperature suitable for normal spent fuel pool operation on a regular basis and accuracy is not affected by power interruptions.

9.1.4.3.8 Radiation Monitoring

STD COL 9.1-6

Plant procedures require that an operating radiation monitor is mounted on any machine when it is handling fuel. Refer to DCD Subsection 11.5.6.4 for a discussion of augmented radiation monitoring during fuel handling operations.

9.1.4.4 Inspection and Testing Requirements

Add the following paragraph at the end of DCD Subsection 9.1.4.4.

STD COL 9.1-5

The above requirements are part of the plant inspection program for the light load handling system, which is implemented through procedures. In addition to the above inspections, the procedures reflect the manufacturers' recommendations for inspection.

The light load handling program, including system inspections, is implemented prior to receipt of fuel onsite.

9.1.5 OVERHEAD HEAVY LOAD HANDLING SYSTEMS

Add the following at the end of DCD Subsection 9.1.5.

STD SUP 9.1-2

The heavy loads handling program is based on NUREG 0612 and vendor recommendations. The key elements of the program are:

- Listing of heavy loads to be lifted during operation of the plant. This list will be provided once magnitudes have been accurately formalized but no later than three (3) months prior to fuel receipt.

- Listing of heavy load handling equipment as outlined in DCD Table 9.1-5 and whose characteristics are described in Subsection 9.1.5 of the DCD.

- Heavy load handling safe load paths and routing plans including descriptions of interlocks, (automatic and manual) safety devices and procedures to assure safe load path compliance. Anticipated heavy load movements are analyzed and safe load paths defined. Safe load path considerations are based on comparison with analyzed cases, previously defined safe movement areas, and previously defined restricted areas. The analyses are in accordance with Appendix A of NUREG 0612.

- Heavy load handling equipment maintenance manuals and procedures as described in Subsection 9.1.5.5.

- Heavy load handling equipment inspection and test plans, as outlined in Subsections 9.1.5.4 and 9.1.5.5.

- Heavy load handling personnel qualifications, training, and control procedures as described in Subsection 9.1.5.5.

- QA programs to monitor, implement, and ensure compliance with the heavy load-handling procedures as described in Subsection 9.1.5.5.

A quality assurance program, consistent with Paragraph 10 of NUREG-0554, is established and implemented for the procurement, design, fabrication, installation, inspection, testing, and operation of the crane. The program, as a minimum, includes the following elements:

- design and procurement document control

- instructions, procedures, and drawings

- control of purchased material, equipment, and services

- inspection

- testing and test control

- non-conforming items

- corrective action

- records

9.1.5.3 Safety Evaluation

Add the following information at the end of DCD Subsection 9.1.5.3.

STD SUP 9.1-1 There are no planned heavy load lifts outside those already described in the DCD. However, over the plant life there may be occasions when heavy loads not presently addressed need to be lifted (i.e. in support of special maintenance/ repairs). For these occasions, special procedures are generated that address, as a minimum, the following:

- The special procedure complies with NUREG-0612.
- A safe load path is determined. Mechanical and/or electrical stops are incorporated in the hardware design to prohibit travel outside the safe load path. Maximum lift heights are specified to minimize the impact of an unlikely load drop.
- Where a load drop could occur over irradiated fuel or safe shutdown equipment, the consequence of the load drop is evaluated. If the evaluation concludes that the load drop is not acceptable, an alternate path is evaluated, or the lift is prohibited.
- The lifting equipment is in compliance with applicable ANSI standards and has factors of safety that meet or exceed the requirements of the applicable standards.
- Operator training is provided prior to actual lifts.
- Inspection of crane components is performed in accordance with the manufacturer recommendations.

STD COL 9.1-6 Plant procedures require that an operating radiation monitor is mounted on any crane when it is handling fuel. Refer to DCD Subsection 11.5.6.4 for a discussion of augmented radiation monitoring during fuel handling operations.

9.1.5.4 Inservice Inspection/Inservice Testing

Add the following paragraph at the end of DCD Subsection 9.1.5.4.

STD COL 9.1-5 The above requirements are part of the plant inspection program for the overhead heavy load handling system, which is implemented through procedures. In addition to the above inspections, the procedures reflect the manufacturers' recommendations for inspection and the NUREG-0612 recommendations.

The overhead heavy load handling equipment inservice inspection procedures, as a minimum, address the following:

- Identification of components to be examined
- Examination techniques
- Inspection intervals
- Examination categories and requirements
- Evaluation of examination results

The overhead heavy load handling program, including system inspections, is implemented prior to receipt of fuel onsite.

9.1.5.5 Load Handling Procedures

STD SUP 9.1-3 Load handling operations for heavy loads that are handled over, could be handled over or are in the proximity of irradiated fuel or safe shutdown equipment are controlled by written procedures. As a minimum, procedures are used for handling loads with the spent fuel cask bridge and polar cranes, and for those loads listed in Table 3.1-1 of NUREG 0612. The procedures include and address the following elements:

- The specific equipment required to handle load (e.g., special lifting devices, slings, shackles, turnbuckles, clevises, load cells, etc.).

- Qualification and training of crane operators and riggers in accordance with chapter 2-3.1 of ASME B30.2, "Overhead and Gantry Cranes."
- The requirements for inspection and acceptance criteria prior to load movement.
- The defined safe load path and provisions to provide visual reference to the crane operator and/or signal person of the safe load path envelope.
- Specific steps and proper sequence to be followed for handling load.
- Precautions, limitations, prerequisites, and/or initial conditions associated with movement of heavy loads.
- The testing, inspection, acceptance criteria and maintenance of overhead heavy load handling systems. These procedures are in accordance with the manufacturer recommendations and are consistent with ANSI B30.2 or with other appropriate and applicable ANSI standards.

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, spent fuel pool or safe shutdown equipment. Paths are defined clearly in procedures and equipment layout drawings. Equipment layout drawings showing the safe load path are used to define safe load paths in load handling procedures. Deviation from defined safe load paths requires a written alternative procedure approved by a plant safety review committee.

9.1.6 COMBINED LICENSE INFORMATION FOR FUEL STORAGE AND HANDLING

9.1.6.5 Inservice Inspection Load Handling Systems

STD COL 9.1-5 This COL Item is addressed in Subsections 9.1.4.4 and 9.1.5.4.

9.1.6.6 Operating Radiation Monitor

STD COL 9.1-6 This COL Item is addressed in Subsections 9.1.4.3.8 and 9.1.5.3.

9.1.6.7 Coupon Monitoring Program

STD COL 9.1-7 A spent fuel rack Metamic coupon monitoring program is to be implemented when the plant is placed into commercial operation. This program will include tests to monitor bubbling, blistering, cracking, or flaking; and a test to monitor for corrosion, such as weight loss measurements and/or visual examination. The program will also include testing to monitor changes in physical properties of the absorber material, including neutron attenuation and thickness measurements.

The program will include the methodology and acceptance criteria for the tests listed and provide corrective action requirements based on vendor recommendations and industry operating experience. The program will be implemented through plant procedures.

Metamic Monitoring Acceptance Criteria:

- Verification of continued presence of the boron is performed by neutron attenuation measurement. A decrease of no more than 5% in Boron-10 content, as determined by neutron attenuation, is acceptable. This is equivalent to a requirement for no loss in boron within the accuracy of the measurement.

- Coupons are monitored for unacceptable swelling by measuring coupon thickness. An increase in coupon thickness at any point of no more than 10% of the initial thickness at that point is acceptable.

Changes in excess of either of the above two acceptance criteria are investigated under the corrective action program and may require early retrieval and measurement of one or more of the remaining coupons to provide validation that the indicated changes are real. If the deviation is determined to be real, an engineering evaluation is performed to identify further testing or any corrective action that may be necessary.

Additional parameters are examined for early indications of the potential onset of Metamic degradation that would suggest a need for further attention and possibly a change in the coupon withdrawal schedule. These include visual inspection for surface pitting, blistering, cracking, corrosion or edge deterioration, or unaccountable weight loss in excess of the measurement accuracy.

9.2 WATER SYSTEMS

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

9.2.1.2 System Description

Add the following paragraph to the end of the Cooling Tower subsection in DCD Subsection 9.2.1.2.2.

PTN SUP 9.2-1 The SWS Cooling Tower was evaluated for potential impacts from interference and air restriction effects due to yard equipment layout and tower operation in an adjacent unit. Based on unit spacing, yard equipment layout, and the margins inherent in the performance requirements and design conditions of the towers, no adverse impacts were determined.

Replace the paragraph in DCD Subsection 9.2.1.2.3.4 with the following paragraph.

PTN DEP 2.0-2 During the plant cooldown phase in which the normal residual heal removal system has been placed in service and is providing shutdown cooling, the service water cooling tower provides cooling water at a temperature of 89.8°F or less when operating at design heat load and at an ambient wet bulb temperature of no greater than the maximum normal wet bulb temperature as defined in Chapter 2, Table 2.0-201. Two service water pumps and two cooling tower cells are normally used for plant cooldown, and the cross-connection valves between trains are normally closed. The service water system heat load and flow rate are shown in DCD Table 9.2.1-1. During these modes of operation the normal residual heat removal system and the component cooling water system remove sensible and decay heat from the reactor coolant system. The service water system cooling towers are designed with sufficient margin so that normal time-related degradation of tower performance will not prohibit their support of this heat removal function. In the event of failure of a service water system pump or cooling tower fan, the cooldown time is extended.

9.2.2.1 Design Bases

Replace the first bullet item in the criteria for normal operation in DCD Subsection 9.2.2.1.2.1 with the following information.

PTN DEP 2.0-3

- The component cooling water supply temperature to plant components is not more than 100°F assuming a 100-year return estimate of 2-hour duration wet bulb temperature of 87.4°F for service water cooling (per Table 2.0-201).

  The most limiting component cooled by the CCS, the RCP motor cooling system, has been designed to operate for at least 6 hours continually with cooling water supplied at temperatures up to 100°F.

  The performance of the standard AP1000 CCS and SWS for single cooling water train, full power operation at a maximum safety wet bulb temperature of 87.4°F has demonstrated the highest CCS temperature achieved at these conditions is 97.4°F, for a period of less than 2 hours. As ambient wet bulb temperature decreases, the CCS temperature follows and will return to below 95°F with ambient wet bulb temperature slightly lower than 84°F, assuming nominal performance of both the CCS and SWS. Since the definition of the maximum normal wet bulb temperature value is the seasonal 1 percent exceedance value observed at the site, the annual total operating time for which CCS temperature could exceed 95°F is less than 30 hours per year, for periods of a few hours at most. The maximum CCS temperature of 97.4°F is bounded by the maximum allowable cooling water temperature for reactor coolant pumps (the most limiting component) and the increase in maximum safety wet bulb temperature is therefore acceptable on this basis.

9.2.5.2.1 General Description

Delete the third sentence of the second paragraph and replace the first sentence of the second paragraph of DCD Subsection 9.2.5.2.1 with the following sentence.

PTN COL 9.2-1 The source of water for the potable water system is the Miami-Dade Water and Sewer Department (MDWASD) potable water supply.

9.2.5.3 System Operation

Replace the first and second paragraphs of DCD Subsection 9.2.5.3 with the following information.

PTN COL 9.2-1 The MDWASD potable water supply system provides filtered and disinfected water to the potable water distribution system.

The MDWASD potable water supply system maintains the required pressure throughout the potable water distribution system. The source of potable water meets the EPA drinking water standards. No biocide or other water treatment is required.

9.2.6.2.1 General Description

Add the following text to the end of DCD Subsection 9.2.6.2.1.

PTN SUP 9.2-3 Sanitary waste is treated on the Units 6 & 7 plant area. The treatment facility has the capacity to treat the waste from Units 1 through 7. The liquid effluent from the sanitary treatment facility is pumped to the blowdown sump where it combines with other effluent streams.

9.2.7.2 System Description

Replace the second paragraph of DCD Subsection 9.2.7.2.1 with the following:

PTN DEP 2.0-2 The high capacity subsystem consists of two 80-percent capacity chilled water pumps, two 20-percent capacity chilled water pumps, two 80-percent capacity water-cooled chillers, two 20-percent air-cooled chillers, a chemical feed tank, an expansion tank, and associated valves, piping, and instrumentation. The subsystem is arranged in two parallel mechanical trains with common supply and return headers. Each train includes one 20-percent capacity pump, one 80-percent capacity pump, one 20-percent capacity chiller, and one 80-percent capacity chiller. A cross-connection at the discharge of each pump allows for each to feed a given chiller of matching capacity.

Replace the last sentence of the first paragraph of DCD Subsection 9.2.7.2.2 with the following sentence:

PTN DEP 2.0-2 The key equipment parameters for the central chilled water system components are contained in Table 9.2.7-1R.

9.2.7.2.4 System Operation

Add the following information at the end of the first paragraph under "Normal Operation" in DCD Subsection 9.2.7.2.4.

PTN DEP 2.0-3 The increased heat load produced by operation at the higher Turkey Point Units 6 & 7 maximum safety ambient wet bulb temperature of 87.4°F can be accommodated within the available capacity margin of the chiller units, without impacting the VWS low capacity subsystem or supporting systems design or plant operation. Cooling coil design calculations indicate that during operation at the standard plant design temperatures (115°F dry bulb, 86.1°F wet bulb), the VBS air handling unit has cooling coil and system margin.

Replace the last sentence of the third paragraph of the Abnormal Operation subsection in DCD Subsection 9.2.7.2.4 with the following sentence:

PTN DEP 2.0-2 Following the loss of offsite power, one diesel generator and one train of the low capacity subsystem operate to supply chilled water to the associated cooling coils of the nuclear island nonradioactive ventilation system and the makeup pump and normal residual heat removal pump compartment unit coolers as shown in Table 9.2.7-1R.

Subsection 9.2.8 is modified using full text incorporation to provide site-specific information to replace the DCD conceptual design information (CDI).

9.2.8 TURBINE BUILDING CLOSED COOLING WATER SYSTEM

PTN CDI

The turbine building closed cooling water system (TCS) provides chemically treated, demineralized cooling water for the removal of heat from nonsafety-related heat exchangers in the turbine building and rejects the heat to the circulating water system.

9.2.8.1 Design Basis

9.2.8.1.1 Safety Design Basis

DCD

The turbine building closed cooling water system has no safety-related function and therefore has no nuclear safety design basis.

9.2.8.1.2 Power Generation Design Basis

The turbine building closed cooling water system provides corrosion-inhibited, demineralized cooling water to the equipment shown in Table 9.2.8-1 during normal plant operation.

PTN CDI

During power operation, the turbine building closed cooling water system provides a continuous supply of cooling water to turbine building equipment at a temperature of 105°F or less assuming a circulating water temperature of 100°F or less.

DCD

The cooling water is treated with a corrosion inhibitor and uses demineralized water for makeup. The system is equipped with a chemical addition tank to add chemicals to the system.

PTN CDI The heat sink for the turbine building closed cooling water system is the circulating water system. The heat is transferred to circulating water through plate type heat exchangers which are components of the turbine building closed cooling water system.

DCD A surge tank is sized to accommodate thermal expansion and contraction of the fluid due to temperature changes in the system.

One of the turbine building closed cooling system pumps or heat exchangers may be unavailable for operation or isolated for maintenance without impairing the function of the system.

The turbine building closed cooling water pumps are provided ac power from the 6900V switchgear bus. The pumps are not required during a loss of normal ac power.

9.2.8.2 System Description

9.2.8.2.1 General Description

PTN CDI Classification of equipment and components is given in Section 3.2. The system consists of two 100-percent capacity pumps, three 50-percent capacity heat exchangers (connected in parallel), one surge tank, one chemical addition tank, and associated piping, valves, controls, and instrumentation. Heat is removed from the turbine building closed cooling water system by the circulating water system via the heat exchangers.

DCD The pumps take suction from a single return header. Either of the two pumps can operate in conjunction with any two of the three heat exchangers. Discharge flows from the heat exchangers combine into a single supply header. Branch lines then distribute the cooling water to the various coolers in the turbine building. The flow rates to the individual coolers are controlled either by flow restricting orifices or by control valves, according to the requirements of the cooled systems. Individual coolers can be locally isolated, where required, to permit maintenance of the cooler while supplying the remaining components with cooling water. A bypass line with a manual valve is provided around the turbine building closed cooling water system heat exchangers to help avoid overcooling of components during startup/low-load conditions or cold weather operation.

The system is kept full of demineralized water by a surge tank which is located at the highest point in the system. The surge tank connects to the system return header upstream of the pumps. The surge tank accommodates thermal expansion and contraction of cooling water resulting from temperature changes in the system. It also accommodates minor leakage into or out of the system. Water makeup to the surge tank, for initial system filling or to accommodate leakage from the system, is provided by the demineralized water transfer and storage system. The surge tank is vented to the atmosphere.

A line from the pump discharge header back to the pump suction header contains valves and a chemical addition tank to facilitate mixing chemicals into the closed loop system to inhibit corrosion in piping and components.

A turbine building closed cooling water sample is periodically taken and analyzed to verify that water quality is maintained.

9.2.8.2.2 Component Description

Surge Tank

A surge tank accommodates changes in the cooling water volume due to changes in operating temperature. The tank also temporarily accommodates leakage into or out of the system. The tank is constructed of carbon steel.

Chemical Addition Tank

The chemical addition tank is constructed of carbon steel. The tank is normally isolated from the system and is provided with a hinged closure for addition of chemicals.

Pumps

Two pumps are provided. Either pump provides the pumping capacity for circulation of cooling water throughout the system. The pumps are single stage, horizontal, centrifugal pumps, are constructed of carbon steel, and have flanged suction and discharge nozzles. Each pump is driven by an ac powered induction motor.

Heat Exchangers

Three heat exchangers are arranged in a parallel configuration. Two of the heat exchangers are in use during normal power operation and turbine building closed cooling water flow divides between them.

PTN CDI

The heat exchangers are plate type heat exchangers. Turbine building closed cooling water circulates through one side of the heat exchanger while circulating water flows through the other side. During system operation, the turbine building closed cooling water in the heat exchanger is maintained at a higher pressure than the circulating water so leakage of circulating water into the closed cooling water system does not occur. The heat exchangers are constructed of titanium plates with a carbon steel frame.

Valves

DCD Manual isolation valves are provided upstream and downstream of each pump. The pump isolation valves are normally open but may be closed to isolate the non-operating pump and allow maintenance during system operation. Manual isolation valves are provided upstream and downstream of each turbine building closed cooling water heat exchanger. One heat exchanger is isolated from system flow during normal power operation. A manual bypass valve can be opened to bypass flow around the turbine building closed cooling water heat exchangers when necessary to avoid low cooling water supply temperatures.

Flow control valves are provided to restrict or shut off cooling water flow to those cooled components whose function could be impaired by overcooling. The flow control valves are air operated and fail open upon loss of control air or electrical power. An air operated valve is provided to control demineralized makeup water to the surge tank for system filling and for accommodating leakage from the system. The makeup valve fails closed upon loss of control air or electrical power.

A TCS heat exchanger can be taken out of service by closing the inlet isolation valve. Water chemistry in the isolated heat exchanger train is maintained by a continuous flow of circulating water through a small bypass valve around the inlet isolation valve.

Backwashable strainers are provided upstream of each TCS heat exchanger. They are actuated by a timer and have a backup starting sequence initiated by a high differential pressure across each individual strainer. The backwash can be manually activated.

Piping

System piping is made of carbon steel. Piping joints and connections are welded, except where flanged connections are used for accessibility and maintenance of components. Nonmetallic piping also may be used.

9.2.8.2.3 System Operation

The turbine building closed cooling water system operates during normal power operation. The system does not operate with a loss of normal ac power.

Startup

PTN CDI

The turbine building closed cooling water system is placed in operation during the plant startup sequence after the circulating water system is in operation but prior to the operation of systems that require turbine building closed cooling water flow. The system is filled by the demineralized water transfer and storage system through a fill line to the surge tank. The system is placed in operation by starting one of the pumps.

DCD

Normal Operation

During normal operation, one turbine building closed cooling water system pump and two heat exchangers provide cooling to the components listed in Table 9.2.8-1. The other pump is on standby and aligned to start automatically upon low discharge header pressure.

During normal operation, leakage from the system will be replaced by makeup from the demineralized water transfer and storage system through the automatic makeup valve. Makeup can be controlled either manually or automatically upon reaching low level in the surge tank.

Shutdown

The system is taken out of service during plant shutdown when no longer needed by the components being cooled. The standby pump is taken out of automatic control, and the operating pump is stopped.

9.2.8.3 Safety Evaluation

The turbine building closed cooling water system has no safety-related function and therefore requires no nuclear safety evaluation.

9.2.8.4 Tests and Inspections

Pre-operational testing is described in Chapter 14. The performance, structural, and leaktight integrity of system components is demonstrated by operation of the system.

9.2.8.5 Instrument Applications

Parameters important to system operation are monitored in the main control room. Flow indication is provided for individual cooled components as well as for the total system flow.

Temperature indication is provided for locations upstream and downstream of the turbine building closed cooling water system heat exchangers. High temperature of the cooling water supply alarms in the main control room. Temperature test points are provided at locations to facilitate thermal performance testing.

Pressure indication is provided for the pump suction and discharge headers. Low pressure at the discharge header automatically starts the standby pump.

Level instrumentation on the surge tank provides level indication and both low- and high-level alarms in the main control room. On low tank level, a valve in the makeup water line automatically actuates to provide makeup flow from the demineralized water transfer and storage system.

9.2.9.2.2 Component Description

Replace the paragraph under the heading Waste Water Retention Basin in DCD Subsection 9.2.9.2.2 with the following text.

PTN COL 9.2-2 The wastewater retention basin, located west of the turbine building for each unit, is a lined basin with two compartments constructed such that its contents (dissolved or suspended), do not penetrate the liner and leach into the ground. Either of these compartments can receive waste streams for holdup or, if required, for treatment to meet specific environmental discharge requirements.

The configuration and size of the wastewater retention basin allows settling of solids larger than 10 microns which may be suspended in the wastewater stream.

Wastewater can be sampled before it is discharged from the wastewater retention basin.

Basin Transfer Pumps

Two 100-percent capacity submersible type pumps, one per basin compartment, send the wastewater from the retention basin to the blowdown sump. Each pump is sized to meet the maximum expected influent flow to prevent overflow of the basin. In the event of oily waste leakage into the retention basin, a recirculation line is provided to recycle the oil/water waste from the basin to the oil separator in the turbine building. In the event of radioactive contamination, this same line can be used to send the contents of the basin to the liquid radwaste system (WLS). Controls are provided for automatic or manual operation of the pumps based on the level of the retention basin.

Add the following text at the end of DCD Subsection 9.2.9.2.2.

PTN SUP 9.2-4 Blowdown Sump

The blowdown sump is a lined concrete structure common to Units 6 & 7 that receives wastewater from the wastewater retention basins of both units, circulating water system (CWS) blowdown from both units, and effluent from the sanitary treatment facility. The blowdown sump is located southeast of the units near the makeup water reservoir. In the absence of CWS blowdown, dilution flow can be supplied to the blowdown sump from the raw water system (reclaimed water or saltwater sources). The waste stream from the blowdown sump is pumped to the deep injection wells. The pumps, downstream piping, and injection wells are part of the deep well injection system (DIS) described in Subsection 9.2.12. The blowdown sump, injection pumping station and associated piping to the injection wells is sized with adequate capacity to accommodate the highest expected influent flow rate to the blowdown sump without overflowing of the sump.

9.2.9.5 Instrumentation Applications

Add the following after the first paragraph of DCD Subsection 9.2.9.5.

PTN COL 9.2-2 Level instrumentation is provided at the wastewater retention basin and is used to control operation of the basin transfer pumps. High-level alarms indicate the basin level where operator action is required.

PTN SUP 9.2-5 Level instrumentation is provided at the blowdown sump and is used to control operation of the pumps discharging to the deep injection wells. A high level alarm indicates the sump level where operator action is required.

STD DEP 1.1-1 Add the following subsections after DCD Subsection 9.2.10. DCD Subsections 9.2.11 and 9.2.12 are renumbered as Subsections 9.2.13 and 9.2.14, respectively.

9.2.11 RAW WATER SYSTEM

PTN SUP 9.2-2 The raw water system (RWS) provides makeup to the circulating water mechanical draft cooling tower basins, demineralized water treatment system, raw water storage tank, the fire protection system fire water storage tanks, and service water cooling tower basins.

9.2.11.1 Design Basis

9.2.11.1.1 Safety Design Basis

The RWS has no safety-related function and therefore has no nuclear safety design basis.

Failure of the RWS or its components does not affect the ability of safety-related systems to perform their intended function.

The RWS does not have the potential to be a flow path for radioactive fluids.

9.2.11.1.2 Power Generation Design Basis

9.2.11.1.2.1 Normal Operation

The RWS provides a continuous supply of makeup water from 3 separate sources to the following services: (Figure 9.2-201 shows which sources supply which services).

- Circulating water system fill and makeup (sources: reclaimed water and/or saltwater)
- SWS fill and makeup (source: potable water)
- Demineralized water treatment system feed (source: potable water)

In addition, the RWS performs the following functions (Figure 9.2-201 shows which sources supply which functions):

- Filling the fire protection system fire water storage tanks (source: potable water)
- Providing the water for miscellaneous plant uses such as strainer backwash and media filter backwashes (source: potable water)
- Providing dilution flow required for liquid radwaste discharge (sources: reclaimed water and/or saltwater)

9.2.11.1.2.2 Outage Mode Operation

During plant outages, the RWS provides water to the same services as during normal operation with the exception of circulating water system makeup.

9.2.11.2 System Description

9.2.11.2.1 General Description

The RWS is shown in Figure 9.2-201 (Sheets 1–3). Classification of components and equipment for the RWS is given in Section 3.2.

9.2.11.2.1.1 Reclaimed Water

One of the sources of makeup water for the circulating water system is reclaimed water supplied to the FPL reclaimed water treatment facility from the MDWASD. From the FPL reclaimed water treatment facility, the reclaimed water is stored in the makeup water reservoir before being pumped to the circulating water system cooling tower basins. This arrangement is shown on Figure 9.2-201, Sheet 1 of 3.

9.2.11.2.1.2 Saltwater

The other source available for makeup water to the circulating water system is saltwater supplied from substratum radial collector wells. These wells pump saltwater that recharges from the marine environment (Biscayne Bay). Saltwater is used when a sufficient quantity and/or quality of treated reclaimed water is unavailable. This arrangement is shown in Figure 9.2-201, Sheet 2 of 3.

9.2.11.2.1.3 Potable Water

The MDWASD potable water supply provides water to the raw water storage tank. The raw water storage tank provides makeup water for the service water cooling towers. Additionally, the raw water storage tank also provides water for the fire protection system, demineralized water treatment system and other miscellaneous users. This arrangement is shown on Figure 9.2-201, Sheet 3 of 3.

9.2.11.2.2 Component Description

9.2.11.2.2.1 Components Handling Reclaimed Water

FPL Reclaimed Water Treatment Facility

The FPL reclaimed water treatment facility is designed to remove constituents from the sewage wastewater treatment plant in order to use it in the circulating water system. The FPL reclaimed water treatment facility includes pumps, trickling filters, clarifiers, deep bed filters, and solids handling equipment to reduce the levels of iron, magnesium, oil and grease, total suspended solids, nutrients, and silica to usable levels for the circulating water system.

Makeup Water Reservoir

The makeup water reservoir is used to store cooling water from the FPL reclaimed water treatment facility to be used as makeup to the circulating water system.

Reclaimed Makeup Water Pumps

Three 50-percent reclaimed makeup water pumps per unit are provided to supply reclaimed water from the makeup water reservoir for the services and functions listed in Subsection 9.2.11.1.2. They are powered from the normal ac power system.

Piping

The piping is designed to accommodate transient effects that may be generated by normal starting and stopping of pumps, opening and closing of valves, or other normal operating events. Air release valves are provided in the reclaimed makeup water pump discharge piping to vent air on pump start.

Screens

Coarse and fine screens are installed on the inlet to each reclaimed makeup water pump to prevent debris in the makeup water reservoir from entering the pump bay.

9.2.11.2.2.2 Components Handling Saltwater

Radial Collector Wells

Saltwater is supplied by four radial collector wells for the two units. A radial collector well consists of a central reinforced concrete caisson extending below ground level. Screens extend from the caisson laterally below Biscayne Bay. The wells are designed and sited to induce recharge from Biscayne Bay.

Saltwater Makeup Pumps

Four 33 1/3-percent saltwater makeup pumps per unit are provided to supply saltwater for the services and functions listed in Subsection 9.2.11.1.2. Each pump discharge line has a motor-operated valve located between the pump discharge and the output header to permit isolation of the pump. Two pumps are provided in each of the four radial collector wells for the two units. The pumps are powered from the normal ac power system.

Piping and Valves

The piping is designed to accommodate transient effects that may be generated by normal starting and stopping of pumps, opening and closing of valves, or other normal operating events. Air release valves are provided in the saltwater makeup pump discharge piping to vent air on pump start. Motor-operated valves are provided to direct the flow as required.

9.2.11.2.2.3 Components Handling Potable Water

Raw Water Storage Tank

A raw water storage tank is provided for Units 6 & 7. This tank receives water from the MDWASD potable water supply. The tank includes features to prevent contamination of the potable water supply by the tank contents. Should the potable water supply to the storage tank be interrupted, the volume of water in the tank (a minimum of two million gallons) provides sufficient time to facilitate a temporary supply of water to the service water cooling tower basins from another on-site water source, such as water from the makeup water reservoir (MWR). The

MWR has a capacity well in excess of that needed to support cooldown to cold shutdown conditions and maintain the station in Mode 5 for greater than 7 days.

Raw Water Ancillary Pumps

Two 100-percent raw water ancillary pumps per unit draw water from the raw water storage tank to supply the required flow for the services and functions listed in Subsection 9.2.11.1.2. They are powered from the normal ac power system. The raw water ancillary pumps can be manually loaded onto the standby diesel generators to provide makeup to the service water cooling tower basins, if necessary, following a loss of normal ac power.

Piping

The piping is designed to accommodate transient effects that may be generated by normal starting and stopping of pumps, opening and closing of valves, or other normal operating events. Air release valves are provided in the raw water ancillary pump discharge piping to vent air on pump start.

9.2.11.3 System Operation

The RWS operates during normal modes of operation, including startup, power operation, cooldown, shutdown, and refueling.

Reclaimed water from the MDWASD supplies makeup water for the circulating water system of Units 6 & 7. Saltwater, from radial collector wells, also provides makeup water to the cooling tower basins. The circulating water system is designed to accommodate 100-percent supply from reclaimed water, saltwater, or a combination of the two sources. The ratio of water supplied by the two makeup water sources varies based on the availability of reclaimed water from the MDWASD.

Makeup water for the service water system makeup is supplied by the MDWASD potable water supply to the raw water storage tank. This water is also the source for demineralized water, fire protection, and miscellaneous water users.

9.2.11.4 Safety Evaluation

The RWS has no safety-related function and therefore requires no nuclear safety evaluation.

The RWS does not have the potential to be a flow path for radioactive fluids. The RWS has no direct interconnection with any system that contains licensed radioactive fluids. The liquid radwaste effluent interface is at a point in the DIS that prevents the effluent from entering the RWS.

9.2.11.5 Tests and Inspections

Initial test requirements for the RWS are described in Subsection 14.2.9.4.24.

System performance and structural and pressure integrity of system components is demonstrated by operation of the system, monitoring of system parameters such as flow and pressure, and visual inspections.

9.2.11.6 Instrumentation Applications

Pressure indication, with low and high alarms, is provided on the discharges of the raw water pumps. A low discharge pressure signal automatically starts the designated standby pump. Pressure indication, alarms, and controls for pumps included in the FPL reclaimed water treatment facility ensure the required pressure and flow of the raw water supply from the FPL reclaimed water treatment facility.

Level instrumentation is provided at the raw water storage tank to allow the tank level to be monitored and to control the flow of the MDWASD supplied potable water to the tank. Abnormally high or low water levels in the tank will be alarmed in the control room.

Level instrumentation on the fire water tanks automatically opens the fill valve on low tank level and closes on high level.

Instrumentation requirements for makeup to the SWS and CWS cooling tower basins are described in DCD Subsection 9.2.1 and FSAR Subsection 10.4.5, respectively.

STD DEP 1.1-1

9.2.12 DEEP WELL INJECTION SYSTEM

PTN SUP 9.2-2

The DIS provides underground disposal of plant wastewater, including CWS blowdown and liquid radwaste, into the Boulder Zone. The system consists of 12 deep injection wells, 6 dual-zone monitoring wells, piping, valving, pumps, and instrumentation for system operational monitoring.

Dilution of the liquid radwaste is initiated as the radwaste enters the DIS in the discharge stream from the blowdown sump. The content of the blowdown sump is a combination of waste streams largely comprised of reclaimed water or saltwater from circulating water system blowdown during plant operation or from the alternate dilution flow paths when circulating water system blowdown is not sufficient or available for dilution. The DIS is shown in Figure 9.2-203.

The alternate dilution flow, when using reclaimed water as the cooling water makeup source, is reclaimed water supplied from the makeup water reservoir. The makeup water reservoir is a concrete structure that contains between 275 and 300 million gallons of reclaimed water that is available for use as makeup for the cooling tower evaporative, drift, and blowdown losses and the alternate dilution flow to achieve a DCD-referenced nominal 12,000 gpm dilution flow. The reservoir contains approximately 5 days of makeup water to supply both units' cooling towers operating at full power.

9.2.12.1 Design Basis

9.2.12.1.1 Safety Design Basis

The DIS has no safety-related function and therefore has no nuclear safety design basis.

Failure of the DIS does not affect the ability of safety-related systems to perform their intended function. The DIS functions to dispose and confine plant wastewater in the Boulder Zone.

The DIS is a flow path for liquid radwaste and liquid nonradioactive waste discharge.

9.2.12.1.2 Power Generation Design Basis

9.2.12.1.2.1 Normal Operation

DIS operations maintain the required minimum dilution factor to control the concentrations of liquid radwaste discharges arising from the release of WLS monitor tank contents. The activity concentration of the radwaste portion of the effluent is controlled to 10 CFR Part 20, Appendix B, effluent concentration limits (ECLs) by specifying and maintaining flow rates at the blowdown sump discharge corresponding to at least the minimum dilution factor (DF). The required minimum DF is calculated and applied before the release of liquid radwaste (batch is the only release mode anticipated) to ensure the activity concentration of the mixture complies with 10 CFR Part 20, Appendix B, ECLs. Implementation of the liquid radwaste effluent control program is in accordance with the Turkey Point Units 6 & 7 Offsite Dose Calculation Manual (ODCM), an operational program identified in Table 13.4-201.

9.2.12.1.2.1.1 Reclaimed Water

The deep well injection flow rate when 100 percent reclaimed water is in use for cooling is nominally approximately 12,500 gallons per minute (gpm) (normal) and 13,000 gpm (maximum) for both units. The liquid radwaste component of this flow rate is 3 gpm (normal) and 150 gpm (maximum) for both units. Three deep injection wells are sufficient for reclaimed water—two active and one as a backup.

9.2.12.1.2.1.2 Saltwater

The deep well injection flow rate when 100 percent saltwater is in use for cooling is nominally approximately 58,000 gpm (normal) and 59,000 gpm (maximum) for both units. The liquid radwaste component of this flow rate is 3 gpm (nominal) and 150 gpm (maximum) for both units. Eleven deep injection wells are sufficient for saltwater—nine active and two as backup.

9.2.12.1.2.2 Outage Mode Operation

Refer to Subsection 9.2.12.1.2.1.

9.2.12.2 System Description

The following system and component descriptions are typical. The actual system and components may vary.

9.2.12.2.1 General Description

The proposed locations of the deep injection wells and dual zone monitoring wells are depicted in Figure 9.2-202. The liquid waste stream collection and disposal schematic is shown in Figure 9.2-203. Classification of components and equipment for the DIS is given in Section 3.2. The operation of the DIS is identical for both reclaimed and saltwater—only the number of deep injection wells used differs. Additional valving and system monitoring is required for the system when saltwater is used as a makeup water since more deep injection wells are required because of the higher flow rates.

9.2.12.2.2 Component Description

Deep Injection Wells

Each of the deep injection wells is constructed with concentric steel casings to isolate and protect groundwater from injected fluid. Each injection well is constructed with new and unused 64- (or greater), 54-, 44-, 34-, and 24-inch-outside-diameter steel casings designed to last for the life expectancy of the well. The 64- (or greater), 54-, 44-, and 34-inch-diameter casings have a minimum wall thickness of 0.375 inches and conform to American Society for Testing and Material (ASTM) 139, Grade B specifications. The final 24-inch-diameter casing has a 0.5-inch wall thickness, is seamless, and conforms to American Petroleum Institute (API) 5L specifications or ASTM 153 specifications. The well casings are selected to provide protection against casing failure during cementing operations, protect against failure during operation of the well and subsequent pressure tests, and provide sufficient corrosion protection. The 54-, 44-, and 34-inch-diameter casings are encased in cement on both the outside and the inside of the casing to protect against exposure to groundwater. The outside of the 24-inch-diameter casing is encased in cement to protect against exposure to groundwater. A nominal 18-inch-diameter fiberglass reinforced plastic (FRP) injection tubing with a wall thickness of 0.76 inches is installed inside the 24-inch-diameter casing to protect the 24-inch-diameter casing from exposure to injected fluids and subsequent corrosion. The annular space between the 24-inch-diameter casing and the FRP injection tubing will be filled with a nonhazardous corrosion inhibitor and sealed at the base and top to create a pressure-tight annular space. Figure 9.2-204 depicts a typical deep injection well. This schematic is based on actual conditions observed at Deep Injection Well DIW-1.

Dual Zone Monitoring Wells

Each of the dual zone monitor wells is constructed with concentric steel casings and a final FRP casing. Each monitor well is constructed with new and unused 44-, 34-, 24-, 16-, and 6.625-inch-diameter casings/tubings designed to last for the life expectancy of the well. The 44-, 34-, and 24-inch-diameter casings are made of steel with a minimum wall thickness of 0.375 inches and conform to ASTM 139, Grade B specifications. The 16-inch-diameter casing is made of steel and has a 0.5-inch wall thickness, is seamless, and conforms to API 5L specifications or ASTM 153 specifications. The well casings are selected to provide protection against casing failure during cementing operations and provide sufficient corrosion protection for the life of the well. The 34- and 24-inch-diameter casings are encased in cement on both the outside and the inside of the casing to protect against exposure to groundwater. The outside of the 16-inch-diameter casing is encased in cement to protect against exposure to groundwater. A nominal 6.625-inch-diameter FRP casing with a wall thickness of 0.27 inches serves as the final casing of the well and is selected due to its corrosion resistance. Figure 9.2-205 depicts a typical dual zone monitoring well.

The typical sampling system and associated equipment used for the dual zone monitoring wells are described below. The upper monitor zone sampling system is equipped with a surface-mounted centrifugal pump and the pump for the lower monitoring zone sampling system is a submersible turbine pump installed inside the lower monitor zone casing via a drop pipe. The pumps are connected to purge piping and have a totalizing flowmeter on each purge piping line. The totalizing flowmeters allow measurement of the volume of water that has been purged from the monitoring zones for each sampling event. A separate purge piping line and totalizing flowmeter is used for each monitoring zone to ensure against comingling of monitoring zone fluids. The purge water holding tank is located near the dual-zone monitoring well or on the containment pad of one of its two associated injection wells. The purge piping is buried as it leaves the monitoring well containment pad and either leads to the existing cooling canal system where it is released or it leads to a purge water holding tank. The upper zone and lower zone purge lines flow into the holding tank when the monitoring zones are being purged in preparation for sample collection. The holding tank is equipped with a pump and water level regulating system to ensure that the holding tank capacity is not exceeded. A pump is used to pump water from the holding tank to one of the associated deep injection wells, where it is pumped down the injection well and into the injection zone. The purge piping for each monitor zone is also connected to a sample collection sink that is located either on the monitor well containment pad or on the containment pad of one of the associated injection wells.

Considering the large depth of confining strata present above the injection zone (approximately 985 feet for DIW-1), it is highly unlikely that plant-derived radioactive contamination would be found in water produced in either monitor zone of the dual-zone monitor well. However, if plant-derived radioactive contamination is detected, the affected water will be pumped to a purge water holding tank and then pumped down one of the injection wells.

Piping

Piping from the blowdown sump dilution connection point is routed to the deep injection wells and distributed in two branches; one branch is oriented in a northsouth direction and located to the east of Unit 6. The second branch is oriented in the east-west direction and located to the south of Units 6 & 7.

The injectate piping connecting the pump station to the deep injection wells consists of a main line from the pump station that passes near each injection well and injectate feeder lines that connect the main line to each deep injection well. The piping is constructed of steel. The pipe diameter closest to the blowdown sump is approximately 60 inches in diameter and the pipe diameter at the last well in a branch is approximately 24 inches in diameter.

Valves

There are multiple valves on each deep injection well. This valving consists of an 18-inch-diameter gate valve located on the wellhead approximately 3 feet above where the injection well exits the ground, and an 18-inch-diameter butterfly valve located on the horizontal run of surface pipe on the concrete well pad. Air/vacuum release valves are provided at the appropriate location on each branch of the blowdown sump discharge piping.

The air/vacuum release valves are designed for the specific application and the level of service expected during operation. The injection lines on the operating wells remain full of water during operation, minimizing the number of times the valves are required to change position. Operating procedures provide the appropriate instructions to ensure actions are implemented correctly to limit or avoid pressure surges in the system. The valves are included in the preventive maintenance program to ensure the valves are checked periodically and maintained within acceptable parameters.

Redundant isolation valves are installed on the injectate main line to allow isolation of the main line in case of damage or failure to this line. Each injectate feeder line is equipped with redundant isolation valves where the injectate feeder lines connect to the main line to allow for the isolation of each individual injectate feeder line. Electronic remotely operated valves will isolate deep injection wells.

Vent valves are installed at required locations on each branch line. Vent valves are included to remove air either coming out of solution or air introduced by the air/vacuum release valves in the event that air is not swept out of the line during system startup. During normal operation, the vent lines are capped and the vent valves locked closed to prevent inadvertent operation. The vents are manually operated as needed for pump startup.

9.2.12.3 System Operation

The DIS operates during normal modes of operation, including startup, power operation, cooldown, shutdown, and refueling.

Dilution water is available during all modes of plant operation to maintain a minimum 6000 gpm dilution rate for each unit discharging liquid radwaste. The DIS is designed to accommodate the blowdown sump discharge flow rates for either source of CWS makeup water—reclaimed water or saltwater. The blowdown flow rate is determined by the number of deep injection wells used.

9.2.12.4 Safety Evaluation

The DIS has no safety-related function and therefore requires no nuclear safety evaluation.

The deep well injection system is the flow path for liquid radwaste discharges. Valving is provided to prevent or minimize the potential for radioactive fluid release to the environment due to damage to the above grade piping or operational issues with the deep injection wells. Section 11.2 describes the potential releases to the environment and includes the evaluation of these postulated releases.

9.2.12.5 Tests and Inspections

Initial test requirements for the DIS are described in Subsection 14.2.9.4.28.

System performance and structural and pressure integrity of system components is demonstrated by operation of the system, monitoring of system parameters such as flow and pressure, and visual inspections.

9.2.12.6 Instrumentation Applications

Continuous injection rate and injection pressure monitoring is performed at each deep injection well in service. Continuous monitoring of the water level of both monitor zones of the dual zone monitor wells is also performed. The data is transmitted to each control room where it is continuously monitored.

Radiological and chemical monitoring is also performed at each operational deep injection well and dual zone monitor well to assess system performance and to monitor confinement in the subsurface. Sections 11.2 and 11.5 describe the radiation monitoring controls governing the discharge to the deep well injection system.

STD DEP 1.1-1

9.2.13 COMBINED LICENSE INFORMATION

9.2.13.1 Potable Water

PTN COL 9.2-1

This COL item is addressed in Subsections 9.2.5.2.1 and 9.2.5.3.

9.2.13.2 Wastewater Retention Basins

PTN COL 9.2-2

This COL item is addressed in Subsections 9.2.9.2.2 and 9.2.9.5.

STD DEP 1.1-1

9.2.14 REFERENCES

PTN DEP 2.0-2

Table 9.2.7-1R
COMPONENT DATA — CENTRAL CHILLED WATER SYSTEM

High Capacity Subsystem	
Water Cooled Chillers	
Capacity (nominal tons)	1700
Compressor type	Centrifugal
Maximum power input (kW)	1700
Entering water temperature (°F)	56
Leaving water temperature (°F)	40
Cooling water flowrate (gpm)	3500 (max)
Air-Cooled Chillers	
Capacity (nominal tons)	~~300~~ 400
Compressor type	Reciprocating, Screw
Maximum power input (kW)	~~375~~ 500
Entering water temperature (°F)	56
Leaving water temperature (°F)	40
Low Capacity Subsystem	
Air-Cooled Chillers	
Capacity (nominal tons)	300
Compressor type	Reciprocating, Screw
Maximum power input (kW)	375
Entering water temperature (°F)	56
Leaving water temperature (°F)	40
Coil	**Flow (gpm)**
VBS MY C01 A/B	138
VBS MY C02 A/C	108
VBS MY C02 B/D	84
VAS MY C07 A/B	24
VAS MY C12 A/B	15
VAS MY C06 A/B	15

Figure 9.2-201 Raw Water System Flow Diagram (Sheet 1 of 3)

PTN SUP 9.2-2

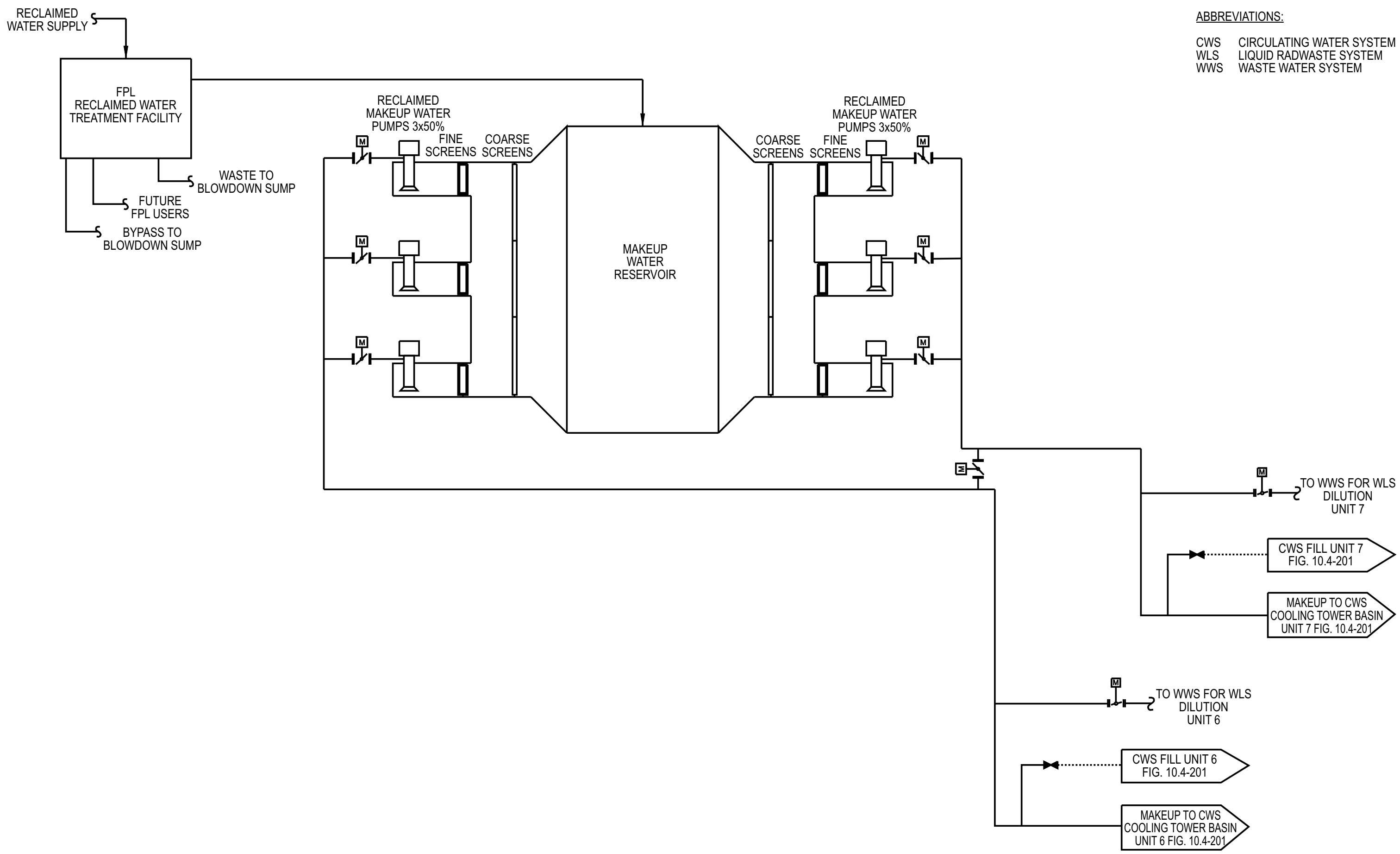


Figure 9.2-201 Raw Water System Flow Diagram (Sheet 2 of 3)

PTN SUP 9.2-2

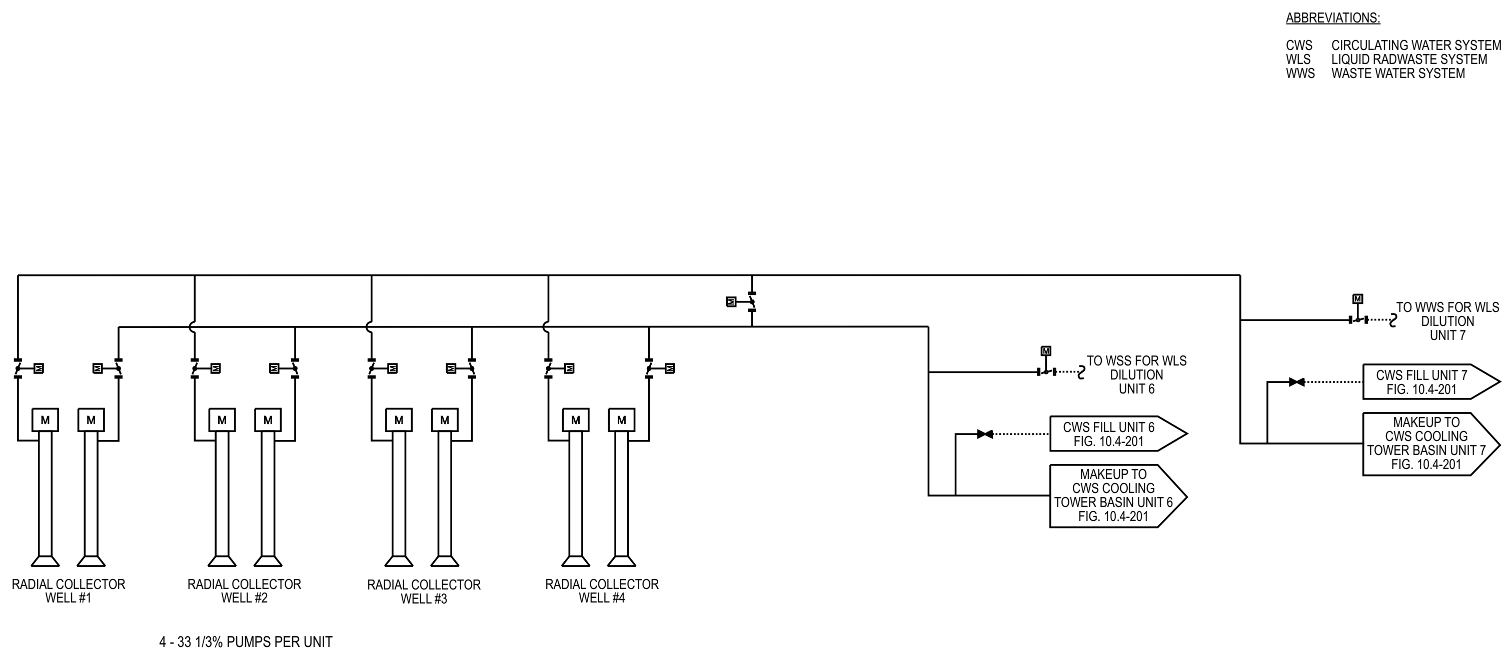


Figure 9.2-201 Raw Water System Flow Diagram (Sheet 3 of 3)

PTN SUP 9.2-2

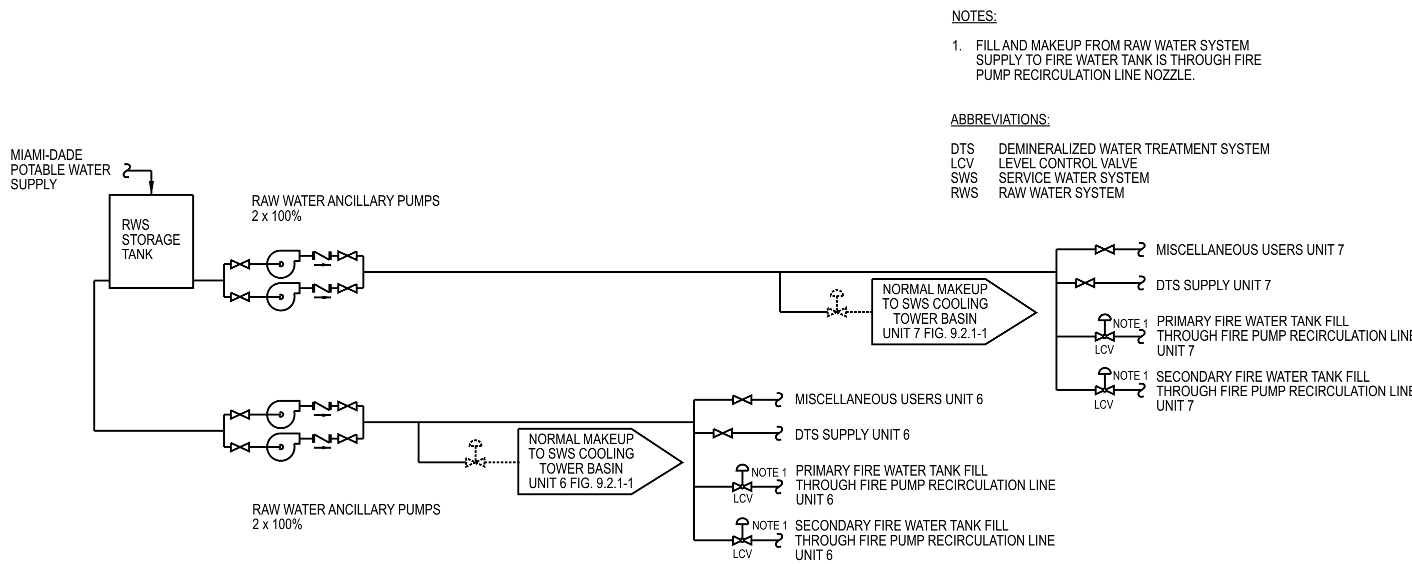


Figure 9.2-202 Deep Well Injection and Dual Zone Monitoring Well Locations

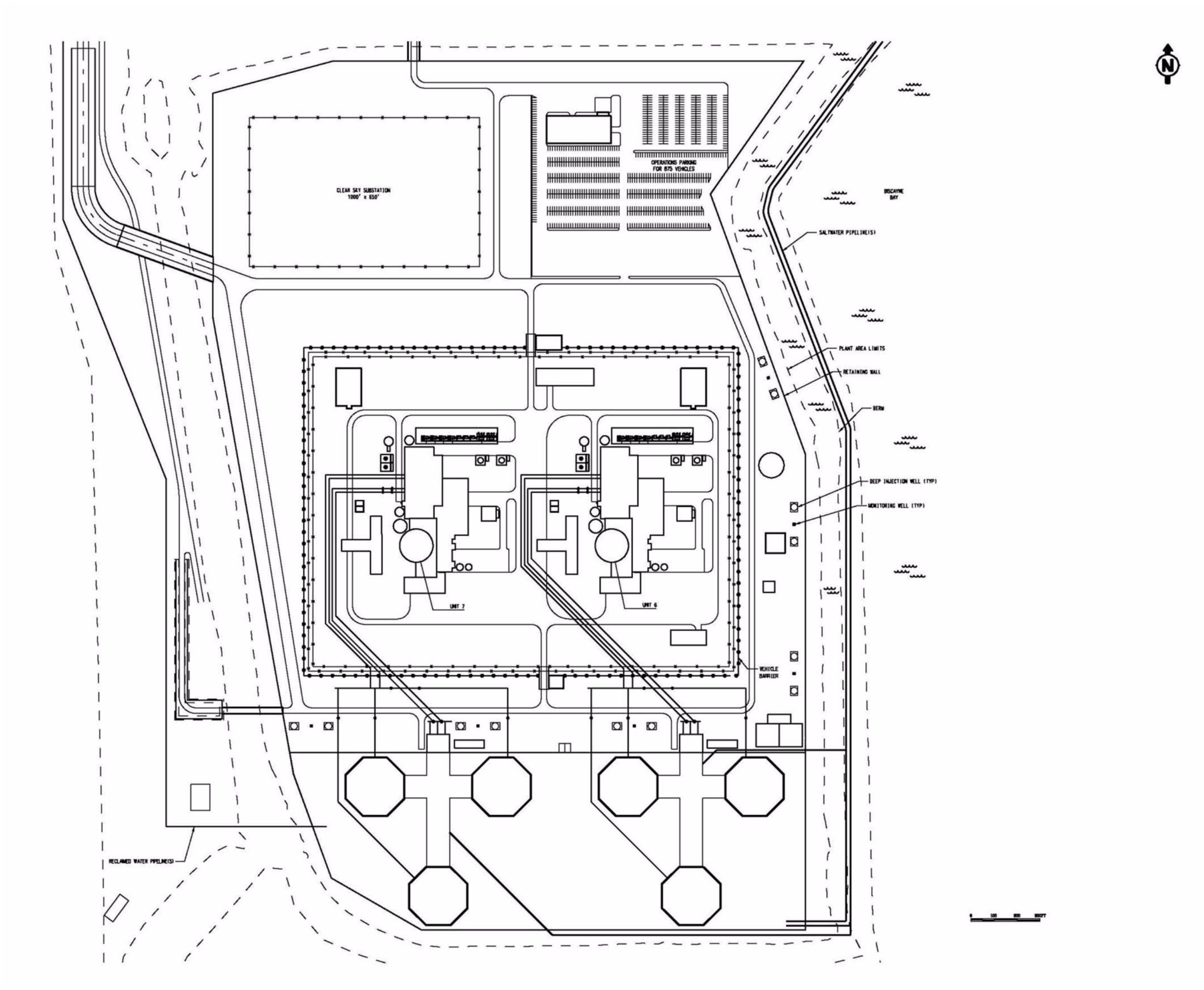


Figure 9.2-203 Liquid Waste Stream Collection and Disposal Schematic (Typical)

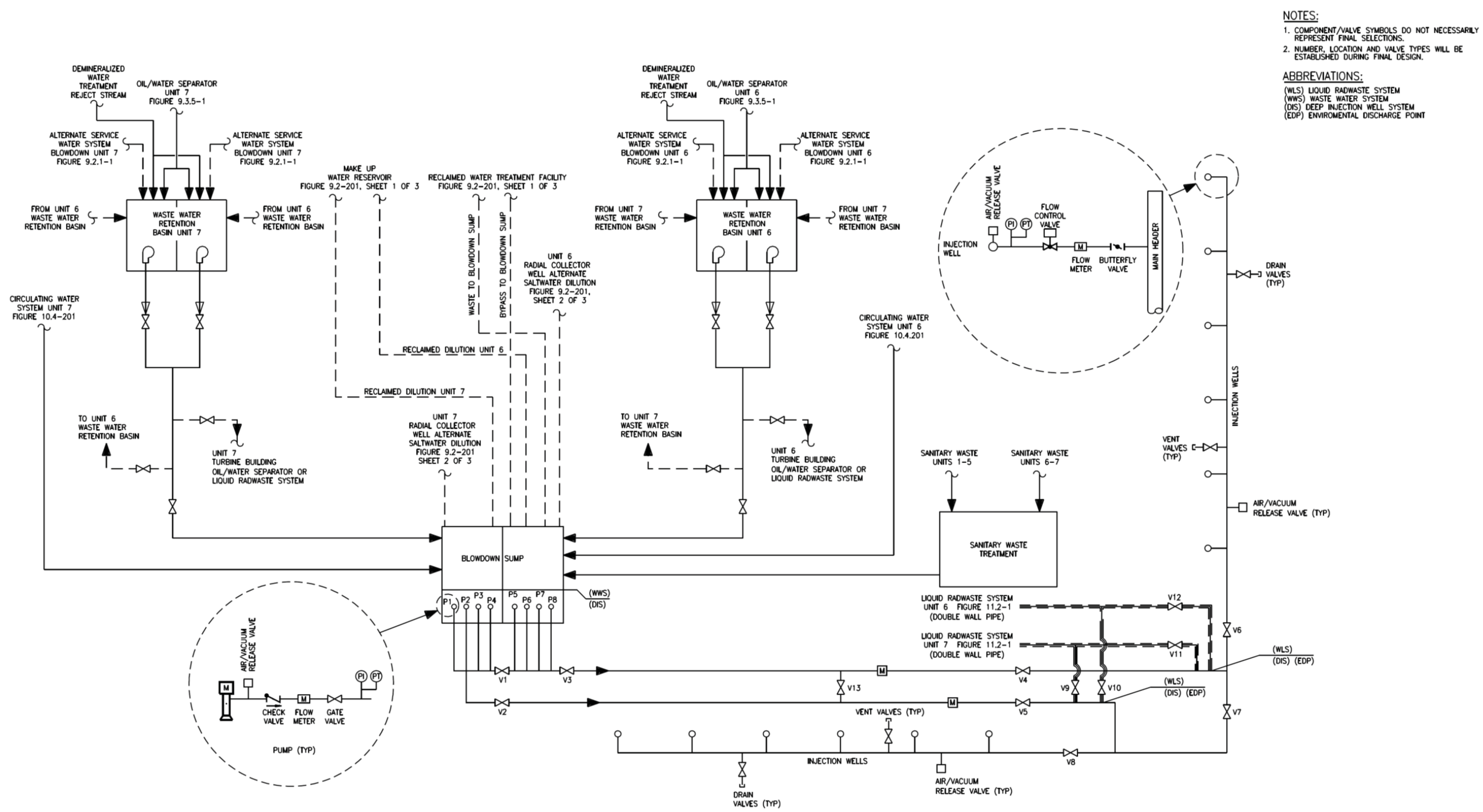


Figure 9.2-204 Deep Injection Well (Typical)

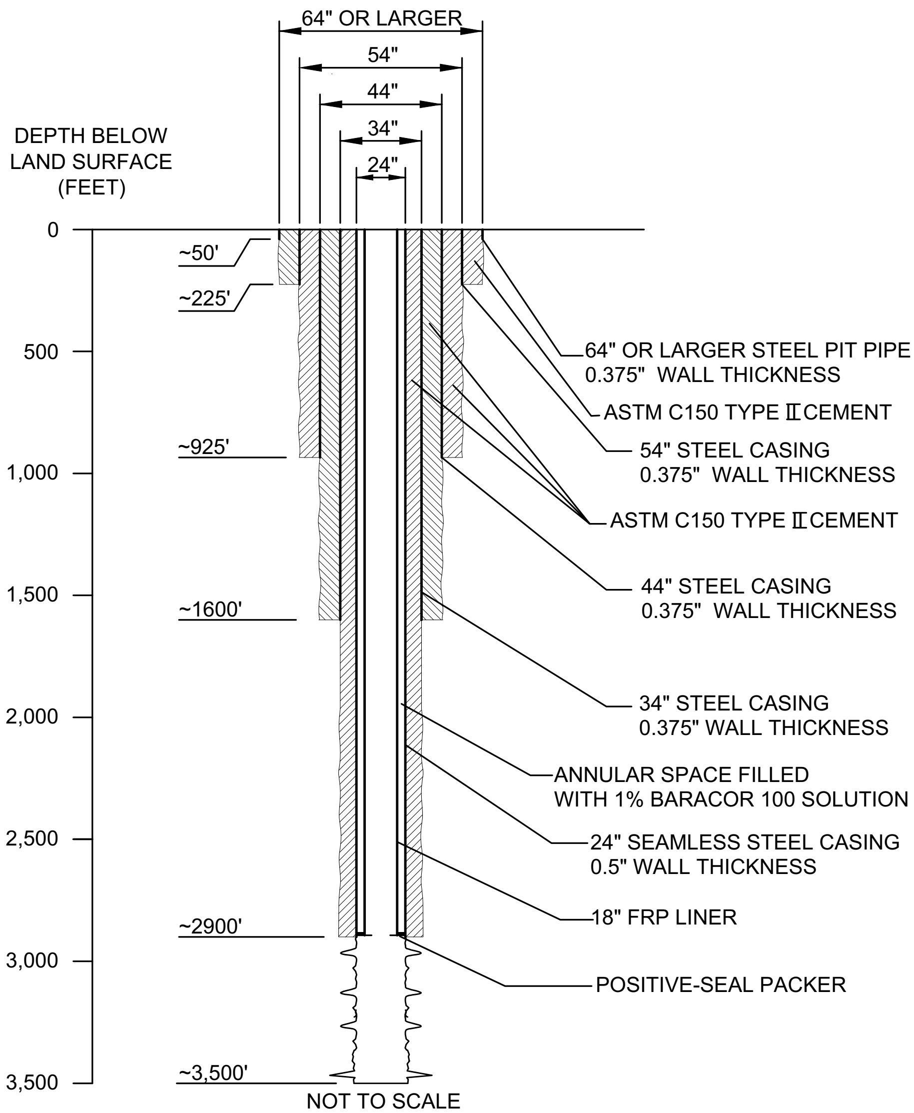
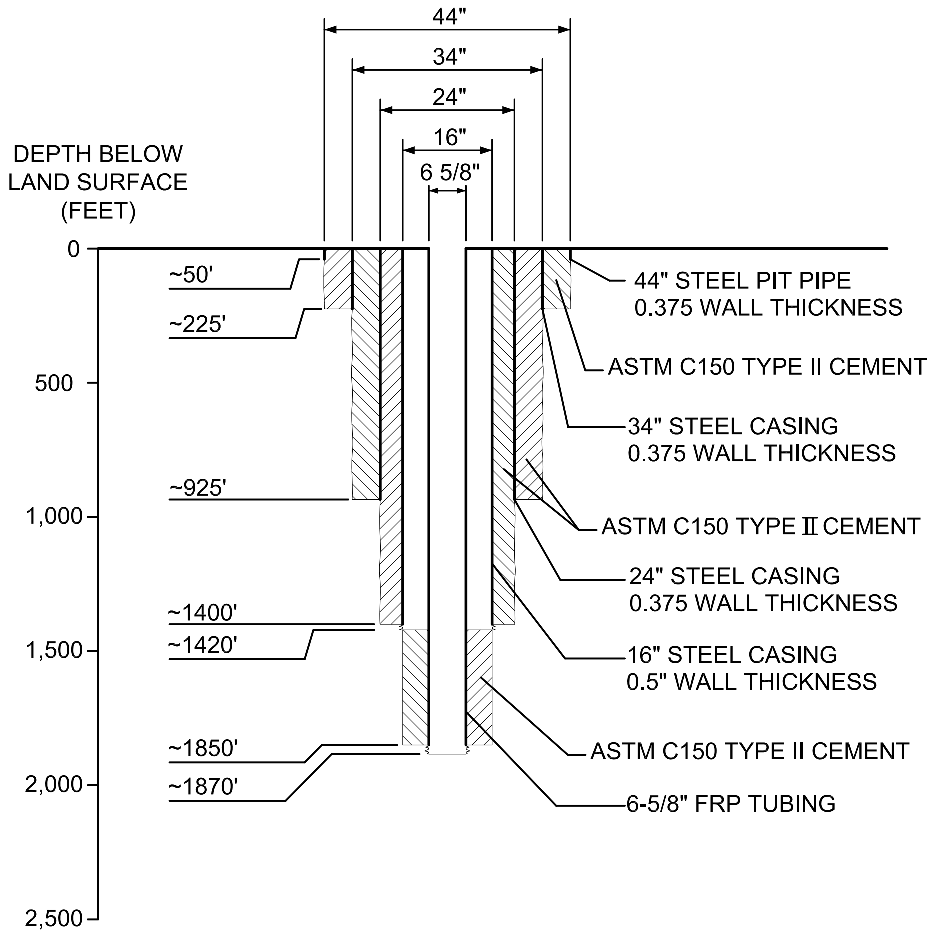


Figure 9.2-205 Dual Zone Monitoring Well (Typical)



NOT TO SCALE

9.3 PROCESS AUXILIARIES

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

9.3.7 COMBINED LICENSE INFORMATION

STD COL 9.3-1 This COL Item is addressed below.

Generic Issue 43, and the concerns of Generic Letter 88-14 and NUREG-1275 regarding degradation or malfunction of instrument air supply and safety-related valve failure, are addressed by the training and procedures for operations and maintenance of the instrument air subsystem and air-operated valves.

Plant systems, including the compressed and instrument air system, are maintained in accordance with procedures. Maintenance procedures are discussed in Subsection 13.5.2.2.6. The instrument air supply subsystem components are maintained and tested in accordance with manufacturers' recommendations and procedures. The safety-related air-operated valves are maintained in accordance with manufacturers' recommendations and tested in accordance with plant procedures to allow proper function on loss of air. The instrument air is periodically sampled and tested for compliance with the quality requirements of ANSI/ISA-S7.3-1981.

Operators are provided training on loss of instrument air in accordance with abnormal operating procedures. Plant systems, including the compressed and instrument air system, are operated in accordance with system operating procedures, abnormal operating procedures, and alarm response procedures which are written in accordance with Subsection 13.5.2. The training program for operations and maintenance personnel is discussed in Section 13.2.

9.4 AIR-CONDITIONING, HEATING, COOLING, AND VENTILATION SYSTEM

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

9.4.1.4 Tests and Inspection

Add the following text at the end of DCD Subsection 9.4.1.4.

STD COL 9.4-1a The main control room / control support area HVAC subsystem of the nuclear island nonradioactive ventilation system (VBS) is tested and inspected in accordance with ASME/ANSI AG-1-1997 and Addenda AG-1a-2000 (Reference 201), ASME N509-1989, ASME N510-1989, and Regulatory Guide 1.140.

The VBS is tested as separate components and as an integrated system. Surveillance tests are performed to monitor the condition of the system. Testing methods include:

- Visual inspection
- Duct and housing leak tests
- Airflow capacity and distribution tests
- Air-aerosol mixing uniformity test
- HEPA filter bank and adsorber bank in-place leak tests
- Duct damper bypass tests
- System bypass tests
- Air heater performance tests
- Laboratory testing of adsorbers
- Ductwork inleakage test

Testing is performed at the frequency provided in Table 1 of ASME N510-1989.

9.4.2.2 System Description

Replace the second sentence of the first paragraph of DCD Subsection 9.4.2.2.1.1 with the following sentence.

PTN DEP 18.8-1 These areas include the men's and women's change and toilet rooms, the ALARA briefing room, offices, corridors, men's and women's rest rooms, conference rooms, and office areas.

9.4.7.4 Tests and Inspections

Add the following text at the end of DCD Subsection 9.4.7.4.

STD COL 9.4-1a The exhaust subsystem of the containment air filtration system (VFS) is tested and inspected in accordance with ASME/ANSI AG-1-1997 and Addenda AG-1a-2000 (Reference 201), ASME N509-1989, ASME N510-1989, and Regulatory Guide 1.140.

The VFS is tested as separate components and as an integrated system. Surveillance tests are performed to monitor the condition of the system. Testing methods include:

- Visual inspection
- Airflow capacity and distribution tests
- HEPA filter bank and adsorber bank in-place leak tests
- System bypass tests
- Air heater performance tests
- Laboratory testing of adsorbers

- Ductwork inleakage test

Testing is performed at the frequency provided in Table 1 of ASME N510-1989.

9.4.12 COMBINED LICENSE INFORMATION

STD COL 9.4-1a This COL Item is addressed in Subsections 9.4.1.4 and 9.4.7.4.

PTN COL 9.4-1b Section 6.4 does not identify any toxic emergencies that require the main control room/control support area HVAC to enter recirculation mode.

9.4.13 REFERENCES

201. American Society of Mechanical Engineers/American National Standards Institute, *Code on Nuclear Air and Gas Treatment*, Section HA, Housings, ASME/ANSI AG-1a-2000, Addenda to ASME AG-1-1997.

9.5 OTHER AUXILIARY SYSTEMS

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

9.5.1.2.1.3 Fire Water Supply System

STD SUP 9.5-1

Add the following paragraphs at the end of DCD Subsection 9.5.1.2.1.3.

Threads compatible with those used by the off-site fire department are provided on all hydrants, hose couplings and standpipe risers, or a sufficient number of thread adapters compatible with the off-site fire department are provided.

9.5.1.6 Personnel Qualification and Training

STD COL 9.5-1

Add the following paragraph at the end of DCD Subsection 9.5.1.6.

Subsections 9.5.1.8.2 and 9.5.1.8.7 summarize the qualification and training programs that are established and implemented for the Fire Protection Program.

STD DEP 1.1-1

Insert the following subsections after DCD Subsection 9.5.1.7. DCD Subsection 9.5.1.8 is renumbered as Subsection 9.5.1.9.

9.5.1.8 Fire Protection Program

STD COL 9.5-1

The fire protection program is established such that a fire does not prevent safe shutdown of the plant and does not endanger the health and safety of the public. Fire protection at the plant uses a defense-in-depth concept that includes fire prevention, detection, control and extinguishing systems and equipment, administrative controls and procedures, and trained personnel. These defense-in-depth principles are achieved by meeting the following objectives:

- Prevent fires from starting.
- Detect rapidly, control, and extinguish promptly those fires that do occur.
- Provide protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by the fire suppression activities does not prevent the safe shutdown of the plant.
- Minimize the potential for radiological releases.

9.5.1.8.1 Fire Protection Program Implementation

As indicated in Table 13.4-201, the required elements of the fire protection program are fully operational prior to receipt of new fuel for buildings storing new fuel and adjacent fire areas that could affect the fuel storage area in that reactor unit. Other required elements of the fire protection program described in this section are fully operational prior to initial fuel loading in that reactor unit.

Elements of the fire protection program are reviewed on a frequency established by procedures and updated as necessary.

9.5.1.8.1.1 Fire Protection Program Criteria

STD COL 9.5-4
STD COL 9.5-3

The fire protection program is based on the criteria of several industry and regulatory documents referenced in FSAR Subsection 9.5.5 and DCD Subsection 9.5.5, and also based on the guidance provided in Regulatory Guide 1.189. DCD Tables 9.5.1-1 and FSAR Table 9.5-201 provide a cross-reference to information addressing compliance with BTP CMEB 9.5-1. Exceptions to the National Fire Protection Association (NFPA) Standards beyond those included in DCD Table 9.5.1-3, and exceptions taken to the NFPA Standards listed in FSAR Subsection 9.5.5, are identified in FSAR Table 9.5-202.

9.5.1.8.1.2 Organization and Responsibilities

STD COL 9.5-1

The organizational structure of the fire protection personnel is discussed in Subsection 13.1.1.2.10.

The site executive in charge of the fire protection program, through the engineer in charge of fire protection, is responsible for the following:

a. Programs and periodic inspections are implemented to:

1. Minimize the amount of combustibles in safety-related areas.

2. Determine the effectiveness of housekeeping practices.

3. Provide for availability and acceptability of the following:

i. Fire protection system and components.

ii. Manual fire fighting equipment.

iii. Emergency breathing apparatus.

iv. Emergency lighting.

v. Portable communication equipment.

STD COL 9.5-8
STD COL 9.5-1

vi. Fire barriers including fire rated walls, floors and ceilings, fire rated doors, dampers, etc., fire stops and wraps, and fire retardant coating. Procedures address the administrative controls in place, including fire watches, when a fire area is breached for maintenance.

STD COL 9.5-1

b. Confirm prompt and effective corrective actions are taken to correct conditions adverse to fire protection and preclude their recurrence.

c. Conducting periodic maintenance and testing of fire protection systems, components, and manual fire fighting equipment, evaluating test results, and determining the acceptability of systems under test in accordance with established plant procedures.

d. Designing and selecting equipment related to fire protection.

e. Reviewing and evaluating proposed work activities to identify potential transient fire loads.

f. Managing the plant fire brigade, including:

    1. Developing, implementing and administering the fire brigade training program.

    2. Scheduling and conducting fire brigade drills.

    3. Critiquing fire drills to determine if training objectives are met.

    4. Performing a periodic review of the fire brigade roster and initiating changes as needed.

    5. Maintaining the fire training program records for members of the fire brigade and other personnel.

    6. Maintaining a sufficient number of qualified fire brigade personnel to respond to fire emergencies for each shift.

g. Developing and conducting the fire extinguisher training program.

h. Implementing a program for indoctrination of personnel gaining unescorted access to the protected area in appropriate procedures which implement the fire protection program, such as fire prevention and fire reporting procedures, plant emergency alarms, including evacuation.

i. Implementing a program for instruction of personnel on the proper handling of accidental events such as leaks or spills of flammable materials.

j. Preparing procedures to meet possible fire situations in the plant and for assuring assistance is available for fighting fires in radiological areas.

k. Implementing a program that utilizes a permit system that controls and documents inoperability of fire protection systems and equipment. This program initiates proper notifications and compensatory actions, such as fire watches, when inoperability of any fire protection system or component is identified.

l. Developing and implementing preventive maintenance, corrective maintenance, and surveillance test fire protection procedures.

m. Confirming that plant modifications, new procedures and revisions to procedures associated with fire protection equipment and systems that have significant impact on the fire protection program are reviewed by an individual who possesses the qualifications of a fire protection engineer.

n. Continuing evaluation of fire hazards during construction or modification of other units on the site. Special considerations, such as fire barriers, fire protection capability and administrative controls are provided as necessary to protect the operating unit(s) from construction or modification activities.

o. Establishing a fire prevention surveillance plan and training plant personnel on that plan.

p. Developing pre-fire plans and making them available to the fire brigade and control room.

PTN COL 9.5-1 The responsibilities of the engineer in charge of fire protection and his staff are described in Subsection 13.1.2.1.3.9.

STD COL 9.5-1

9.5.1.8.2 Fire Brigade

9.5.1.8.2.1 General

PTN COL 9.5-1 The organization of the fire brigade is described in Subsection 13.1.2.1.6.

STD COL 9.5-1 To qualify as a member of the fire brigade, an individual must meet the following criteria:

a. Has attended the required training sessions for the position occupied on the fire brigade.

b. Has passed an annual physical exam including demonstrating the ability for performing strenuous activity and the use of respiratory protection.

9.5.1.8.2.2 Fire Brigade Training

A training program is established so that the capability to fight fires is developed and documented. The program consists of classroom instruction supplemented with periodic classroom retraining, practice in fire fighting, and fire drills. Classroom instruction and training is conducted by qualified individuals knowledgeable in fighting the types of fires that could occur within the plant and its environs and using on-site fire fighting equipment. Individual records of training provided to each fire brigade member, including drill critiques, are maintained as part of the permanent plant files for at least three years to document that each member receives the required training.

The fire brigade leader and at least two brigade members per shift have sufficient training and knowledge of plant safety-related systems to understand the effects of fire and fire suppressants on safe shutdown capability. The brigade leader is competent to assess the potential safety consequences of a fire and advise control room personnel. Such competence by the brigade leader may be evidenced by possession of an operator's license or equivalent knowledge of plant systems.

Personnel assigned as fire brigade members receive formal training prior to assuming brigade duties. The course subject matter is selected to satisfy the requirements of Regulatory Guide 1.189. Course material selection also includes guidance from NFPA 600 (Reference 204) and 1500 (Reference 210) as appropriate. Additional training may also include material selected from NFPA 1404 (Reference 208) and 1410 (Reference 209).

The minimum equipment provided for the fire brigade consists of personal protective equipment such as turnout coats, boots, gloves, hard hats, emergency communications equipment, portable lights, portable ventilation equipment and portable extinguishers. Self-contained breathing apparatus (SCBA) approved by NIOSH, using full face positive pressure masks, and providing an operating life of at least 30 minutes, are provided for selected fire brigade, emergency repair and control room personnel. At least ten masks are provided for fire brigade personnel. At least two extra air bottles, each with at least 30 minutes of operating life, are located on site for each SCBA. An additional on-site 6-hour supply of reserve air is provided to permit quick and complete replenishment of exhausted supply air bottles. DCD Subsection 6.4.2.3 discusses the portable breathing apparatus for control room personnel. Additional SCBAs are provided near the personnel containment entrance for the exclusive use of the fire brigade. The fire brigade leader has ready access to keys for any locked fire doors.

The on-duty shift manager has responsibility for taking certain actions based on an assessment of the magnitude of the fire emergency. These actions include safely shutting down the plant, making recommendations for implementing the Emergency Plan, notification of emergency personnel and requesting assistance from off-duty personnel, if necessary. Emergency Plan consideration of fire emergencies includes the guidance of Regulatory Guide 1.101.

9.5.1.8.2.2.1 Classroom Instruction

Fire brigade members receive classroom instruction in fire protection and fire fighting techniques prior to qualifying as members of the fire brigade. This instruction includes:

a. Identification of the types of fire hazards along with their location within the plant and its environs.

b. Identification of the types of fires that could occur within the plant and its environs.

c. Identification of the location of on-site fire fighting equipment and familiarization with the layout of the plant including ingress and egress routes to each area.

d. The proper use of on-site fire fighting equipment and the correct method of fighting various types of fires including at least the following:

— fires involving radioactive materials

— fires in energized electrical equipment

— fires in cables and cable trays

— fires involving hydrogen

— fires involving flammable and combustible liquids or hazardous process chemicals

— fires resulting from construction or modifications (welding)

— fires involving record files.

e. Review of each individual's responsibilities under the Fire Protection Program.

f. Proper use of communication, lighting, ventilation, and emergency breathing equipment.

g. Fire brigade leader direction and coordination of fire fighting activities.

h. Toxic and radiological characteristics of expected combustion products.

i. Proper methods of fighting fires inside buildings and confined spaces.

j. Detailed review of fire fighting strategies, procedures and procedure changes.

k. Indoctrination of the plant fire fighting plans, identification of each individual's responsibilities, and review of changes in the fire fighting plans resulting from fire protection-related plant modifications.

l. Coordination between the fire brigade and off-site fire departments that have agreed to assist during a major fire on-site is provided to establish responsibilities and duties. Educating the off-site organization in operational precautions when fighting fires on nuclear power plant sites, and awareness of special hazards and the need of radiological protection of personnel.

9.5.1.8.2.2.2 Retraining

Classroom refresher training is scheduled on a biennial basis to supplement retention of the initial training. These sessions may be concurrent with the regular planned meetings.

9.5.1.8.2.2.3 Practice

Practice sessions are held for each fire brigade and for each fire brigade member on the proper method of fighting various types of fires which might occur in the plant. These sessions are scheduled on an annual basis and provide brigade members with team experience in actual fire fighting and the use of emergency breathing apparatus under strenuous conditions encountered in fire fighting.

9.5.1.8.2.2.4 Drills

Fire brigade drills are conducted at least once per calendar quarter for each shift. Each fire brigade member participates in at least two drills annually. Drills are either announced or unannounced. At least one unannounced drill is held annually for each shift fire brigade. At least one drill is performed annually on a “back shift” for each shift’s fire brigade. The drills provide for off-site fire department participation at least annually. Triennially, a randomly selected, unannounced drill shall be conducted and critiqued by qualified individuals independent of the plant staff. Training objectives are established prior to each drill and reviewed by plant management. Drills are critiqued on the following points:

a. Assessment of fire alarm effectiveness.

b. Assessment of time required to notify and assemble the fire brigade.

c. Assessment of the selection, placement and use of equipment.

d. Assessment of the fire brigade leader’s effectiveness in directing the fire fighting effort.

e. Assessment of each fire brigade member’s knowledge of fire fighting strategy, procedures and simulated use of equipment.

f. Assessment of the fire brigade’s performance as a team.

Performance deficiencies identified, based on these assessments, are used as the basis for additional training and repeat drills. Unsatisfactory drill performance is followed by a repeat drill within 30 days.

9.5.1.8.2.2.5 Meetings

Regular planned meetings are held at least quarterly for the fire brigade members to review changes in the Fire Protection Program and other subjects as necessary.

9.5.1.8.3 Administrative Controls

Administrative controls for the Fire Protection Program are implemented through plant administrative procedures. Applicable industry publications are used as guidance in developing those procedures.

Administrative controls include procedures to:

a. Control actions to be taken by an individual discovering a fire, such as notification of the control room, attempting to extinguish the fire, and actuation of local fire suppression systems.

b. Control actions to be taken by the control room operator, such as sounding fire alarms, and notifying the shift manager of the type, size and location of the fire.

c. Control actions to be taken by the fire brigade after notification of a fire, including location to assemble, directions given by the fire brigade leader, the responsibilities of brigade members, such as selection of fire fighting and protective equipment, and use of preplanned strategies for fighting fires in specific areas.

d. Control actions to be taken by the security force upon notification of a fire.

e. Define the strategies established for fighting fires in safety-related areas and areas presenting a hazard to safety-related equipment, including the designation of the:

    1. Fire hazards in each plant area/zone covered by a fire fighting procedure (pre-fire plan). Pre-fire plans utilize the guidance of NFPA 1620 (Reference 205).

    2. Fire extinguishers best suited for controlling fires with the combustible loadings of each zone and the nearest location of these extinguishers.

    3. Most favorable direction from which to attack a fire in each area in view of the ventilation direction, access hallways, stairs, and doors that are most likely to be free of fire, and the best station or elevation for fighting the fire. Access and egress routes that involve locked doors are specifically identified in the procedure with the appropriate precautions and methods for access specified.

4. Plant systems that should be managed to reduce the damage potential during a local fire and the location of local and remote controls for such management (e.g., any hydraulic or electrical system in the zone covered by the specific fire fighting procedure that could increase the hazards in the area because of overpressurization or electrical hazards).

5. Vital heat-sensitive system components that need to be kept cool while fighting a local fire. Particularly hazardous combustibles that need cooling are designated.

6. Potential radiological and toxic hazards in fire zones.

7. Ventilation system operation that provides desired plant air distribution when the ventilation flow is modified for fire containment or smoke clearing operations.

8. Operations requiring control room and shift manager coordination or authorization.

9. Instructions for plant operators and other plant personnel during a fire.

f. Organize the fire brigade and assign special duties according to job title so that the fire fighting functions are covered for each shift by personnel trained and qualified to perform these functions. These duties include command control of the brigade, transporting fire suppression and support equipment to the fire scenes, applying the extinguishing agent to the fire, communication with the control room, and coordination with off-site fire departments.

9.5.1.8.4 Control of Combustible Materials, Hazardous Materials and Ignition Sources

The control of combustible materials is defined by administrative procedures. These procedures impose the following controls:

a. Prohibit the storage of combustible materials (including unused ion exchange resins) in areas that contain or expose safety-related equipment.

b. Govern the handling of and limit transient fire loads such as flammable liquids, wood and plastic materials in buildings containing safety-related systems or equipment.

c. Assign responsibility to the appropriate supervisor for reviewing work activities to identify transient fire loads.

d. Govern the use of ignition sources by use of a flame permit system to control welding, flame cutting, grinding, brazing and soldering operations, and temporary electrical power cables. A separate permit is issued for each area where such work is done. If work continues over more than one shift, the permit is valid for not more than 24 hours when the plant is operating or for the duration of a particular job during plant shutdown. NFPA 51B (Reference 202) and 241 (Reference 203) are used as guidance.

e. Minimize waste, debris, scrap, and oil spills or other combustibles resulting from a work activity in the safety-related area while work is in progress and remove the same upon completion of the activity or at the end of each work shift.

f. Govern periodic inspections for accumulation of combustibles for continued compliance with these administrative controls.

g. Prohibit the storage of acetylene-oxygen and other compressed gasses in areas that contain or expose safety-related equipment or the fire protection system that serves those areas. A permit system is required to control the use of this equipment in safety-related areas of the plant.

h. Govern the use and storage of hazardous chemicals in areas that contain or expose safety-related equipment.

i. Control the use of specific combustibles in safety-related areas. Wood used in safety-related areas during maintenance, modification, or refueling operation (such as lay-down blocks or scaffolding) is treated with a flame retardant in accordance with NFPA 703 (Reference 207). Use of wood inside buildings containing systems or equipment important to safety is only permitted when suitable noncombustible substitutes are not available. Equipment or supplies (such as new fuel) shipped in untreated combustible packing containers are unpacked in safety-related areas if required for valid operating reasons. However, combustible materials are removed from the area immediately following unpacking. Such transient combustible material, unless stored in approved containers, is not left unattended during lunch breaks, shift changes, or other similar periods. Loose combustible packing material, such as wood or paper excelsior, or polyethylene sheeting, is placed in metal containers with tight-fitting self-closing metal covers. Only noncombustible panels or flame-retardant tarpaulins or approved materials of equivalent fire-retardant characteristics are used. Any other fabrics or plastic films used are certified to conform to the large-scale fire test described in NFPA 701 (Reference 206).

j. Govern the control of electrical appliances in areas that contain or expose safety-related equipment.

9.5.1.8.5 Control of Radioactive Materials

The plant is designed with provisions for sampling of liquids resulting from fire emergencies that may contain radioactivity and may be released to the environment. Plant operating procedures require such liquids to be collected, sampled, and analyzed prior to discharge. Liquid discharges are required to be below activity limits prior to discharge.

9.5.1.8.6 Testing and Inspection

Testing and inspection requirements are imposed through administrative procedures. Maintenance or modifications to the fire protection system are subject to inspection for conformation to design requirements. Procedures governing the inspection, testing, and maintenance of fire protection alarm and detection systems, and water-based suppression and supply systems, utilize the guidance of NFPA 72 (DCD Subsection 9.5.5, Reference 2) and NFPA 25 (Reference 212). Installation of portions of the system where performance cannot be verified through pre-operational tests, such as penetration seals, fire retardant coatings, cable routing, and fire barriers are inspected. Inspections are performed by individuals knowledgeable of fire protection design and installation requirements. Open flame or combustion-generated smoke is not used for leak testing or similar procedures such as air flow determination. Inspection and testing procedures address the identification of items to be tested or inspected, responsible organizations for the activity, acceptance criteria, documentation requirements and sign-off requirements.

Fire protection materials subject to degradation (such as fire stops, seals and fire retardant coatings are visually inspected periodically for degradation or damage.

Fire hoses are hydrostatically tested in accordance with NFPA 1962 (Reference 201). Hoses stored in outside hose stations are tested annually and interior standpipe hoses are tested every three years.

The fire protection system is periodically tested in accordance with plant procedures. Testing includes periodic operational tests and visual verification of damper and valve positions. Fire doors and their closing and latching mechanisms are also included in these procedures.

STD COL 9.5-6 The preoperational testing program describes the procedures for confirming that the as-installed configuration of fire barriers matches the tested configurations. The procedures describe the process for identifying and dispositioning deviations.

9.5.1.8.7 Personnel Qualification and Training

PTN COL 9.5-1 The engineer in charge of fire protection is responsible for the formulation and implementation of the fire protection program and meets the qualification requirements listed in FSAR Subsection 13.1.2.1.3.9.

STD COL 9.5-1 Qualification and training of other plant personnel involved in the fire protection program is governed by plant qualification procedures and is conducted by personnel qualified by training and experience in these areas. These classifications include training personnel, maintenance personnel assigned to work on the fire protection system, and operations personnel assigned to system operation and testing.

9.5.1.8.8 Fire Doors

STD COL 9.5-3 Fire doors separating safety-related areas are self-closing or provided with closing mechanisms and are inspected semiannually to verify that the automatic hold open, release and closing mechanisms and latches are operable. Watertight and missile resistant doors are not provided with closing mechanisms. Fire doors with automatic hold open and release mechanisms are inspected daily to verify that the doorways are free of obstructions.

Fire doors separating safety-related areas are normally closed and latched. Fire doors that are locked closed are inspected weekly to verify position. Fire doors that are closed and latched are inspected daily to assure that they are in the closed position. Fire doors that are closed and electrically supervised at a continuously manned location are not inspected.

9.5.1.8.9 Emergency Planning

Emergency planning is described in Section 13.3.

STD DEP 1.1-1

9.5.1.9 Combined License Information

9.5.1.9.1 Qualification Requirements for Fire Protection Program

STD COL 9.5-1

This COL Item is addressed as follows:

Qualification requirements for individuals responsible for development of the Fire Protection Program are discussed in Subsections 9.5.1.6 and 9.5.1.8.7.

Training of firefighting personnel is discussed in Subsections 9.5.1.8, 9.5.1.8.2, and 9.5.1.8.7.

Administrative procedures and controls governing the Fire Protection Program during plant operation are discussed in Subsections 9.5.1.8.1.2, 9.5.1.8.3, 9.5.1.8.4, 9.5.1.8.5, and 9.5.1.8.6.

Fire protection system maintenance is discussed in Subsection 9.5.1.8.6.

PTN COL 9.5-2

9.5.1.9.2 Fire Protection Analysis Information

This COL Item is addressed in Subsection 9A.3.3.

9.5.1.9.3 Regulatory Conformance

STD COL 9.5-3

This COL Item is addressed in Subsections 9.5.1.8.1.1, 9.5.1.8.8, and 9.5.1.8.9, and in Table 9.5-201.

9.5.1.9.4 NFPA Exceptions

STD COL 9.5-4 This COL item is addressed in Subsection 9.5.1.8.1.1.

9.5.1.9.6 Verification of Field Installed Fire Barriers

STD COL 9.5-6 This COL Item is addressed in Subsection 9.5.1.8.6.

9.5.1.9.7 Establishment of Procedures to Minimize Risk for Fire Areas Breached During Maintenance

STD COL 9.5-8 This COL item is addressed in Subsection 9.5.1.8.1.2.

Add the following subsection at the end of DCD Subsection 9.5.2.2.4.

9.5.2.2.5 Offsite Interfaces and Emergency Offsite Communications

PTN COL 9.5-9
PTN COL 9.5-10
Offsite interfaces and emergency offsite communications are described in the Emergency Plan.

9.5.2.5 Combined License Information

9.5.2.5.1 Offsite Interfaces

PTN COL 9.5-9 This COL Item is addressed in Subsection 9.5.2.2.5.

9.5.2.5.2 Emergency Offsite Communications

PTN COL 9.5-10 This COL Item is addressed in Subsection 9.5.2.2.5.

9.5.2.5.3 Security Communications

STD COL 9.5-11 This COL Item is addressed in the Physical Security Plan.

Add the following subsection after DCD Subsection 9.5.4.5.1.

9.5.4.5.2 Fuel Oil Quality

STD COL 9.5-13 The diesel fuel oil testing program requires testing both new fuel oil and stored fuel oil. High fuel oil quality is provided by specifying the use of ASTM Grade 2D fuel oil with a sulfur content as specified by the engine manufacturer.

A fuel sample is analyzed prior to addition of ASTM Grade 2D fuel oil to the storage tanks. The sample moisture content and particulate or color is verified per ASTM D4176. In addition, kinematic viscosity is tested to be within the limits specified in Table 1 of ASTM D975. The remaining critical parameters per Table 1 of ASTM D975 are verified compliant within 7 days.

Fuel oil quality is verified by sample every 92 days to meet ASTM Grade 2D fuel oil criteria. The addition of fuel stabilizers and other conditioners is based on sample results.

The fuel oil storage tanks are inspected on a monthly basis for the presence of water. Any accumulated water is to be removed.

9.5.4.7 Combined License Information

9.5.4.7.2 Fuel Degradation Protection

STD COL 9.5-13 This COL Item is addressed in Subsection 9.5.4.5.2.

9.5.5 REFERENCES

201. National Fire Protection Association, *Standard for Inspection, Care, and Use of Fire Hose Couplings, and Nozzles and the Service Testing of Fire Hose*, NFPA 1962, 2003.

202. National Fire Protection Association, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*, NFPA 51B, 2003.

203. National Fire Protection Association, *Standard for Safeguarding Construction, Alteration, and Demolition Operations*, NFPA 241, 2004.

204. National Fire Protection Association, *Standard on Industrial Fire Brigades*, NFPA 600, 2005.

205. National Fire Protection Association, *Recommended Practice for Pre-Incident Planning*, NFPA 1620, 2003.

206. National Fire Protection Association, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*, NFPA 701, 2004.

207. National Fire Protection Association, *Standard for Fire-Retardant Treated Wood and Fire-Retardant Coatings for Building Materials*, NFPA 703, 2006.

208. National Fire Protection Association, *Standard for Fire Service Respiratory Protection Training*, NFPA 1404, 2006.

209. National Fire Protection Association, *Standard on Training for Initial Emergency Scene Operations*, NFPA 1410, 2005.

210. National Fire Protection Association, *Standard on Fire Department Occupational Safety and Health Program*, NFPA 1500, 2007.

211. National Fire Protection Association, *Standard for Fire Protection for Advanced Light Water Reactor Electric Generating Plants*, NFPA 804, 2001.

212. National Fire Protection Association, *Standard for the Inspection, Testing, and Maintenance of Water-based Fire Protection Systems*, NFPA 25, 2008.

Table 9.5-201[a] (Sheet 1 of 7)
AP1000 Fire Protection Program Compliance with BTP CMEB 9.5-1

		BTP CMEB 9.5-1 Guideline	Paragraph	Comp	Remarks
	Fire Protection Program				
STD COL 9.5-3 STD COL 9.5-4	1.	Direction of fire protection program; availability of personnel.	C.1.a(1)	C	Comply. Subsections 9.5.1.8.1.2 and 13.1.1.2.10 address this requirement.
	2.	Defense-in-depth concept; objective of fire protection program.	C.1.a(2)	C	Comply. Subsections 9.5.1.8 and 9.5.1.8.1 address this requirement.
PTN COL 9.5-3 PTN COL 9.5-4	3.	Management responsibility for overall fire protection program; delegation of responsibility to staff.	C.1.a(3)	C	Comply. Subsections 9.5.1.8.1.2, 13.1.2.1.3.9, and 13.1.1.2.10.
	4.	The staff should be responsible for: a. Fire protection program requirements. b. Post-fire shutdown capability. c. Design, maintenance, surveillance, and quality assurance of fire protection features. d. Fire prevention activities. e. Fire brigade organization and training. f. Pre-fire planning.	C.1.a(3)	C	Comply. Subsection 13.1.2.1.3.9 addresses this requirement.

Table 9.5-201[a] (Sheet 2 of 7)
AP1000 Fire Protection Program Compliance with BTP CMEB 9.5-1

		BTP CMEB 9.5-1 Guideline	Paragraph	Comp	Remarks
PTN COL 9.5-3 PTN COL 9.5-4	5.	The organizational responsibilities and lines of communication pertaining to fire protection should be defined through the use of organizational charts and functional descriptions.	C.1.a(4)	C	Comply. Organization and lines of communication are addressed in Figure 13.1-201. Functional descriptions are addressed in Subsections 13.1.1.2.10, 13.1.1.3.1.3, 13.1.2.1.3.9, and 13.1.2.1.5.
	6.	Personnel qualification requirements for fire protection engineer, reporting to the position responsible for formulation and implementation of the fire protection program.	C.1.a(5)(a)	C	Comply. Subsection 13.1.2.1.3.9 addresses this requirement.
STD COL 9.5-3 STD COL 9.5-4	7.	The fire brigade members' qualifications should include a physical examination for performing strenuous activity, and the training described in Position C.3.d.	C.1.a(5)(b)	C	Comply. Subsections 9.5.1.8.2.1 and 9.5.1.8.2.2 addresses this requirement.
	8.	The personnel responsible for the maintenance and testing of the fire protection systems should be qualified by training and experience for such work.	C.1.a(5)(c)	C	Comply. Subsection 9.5.1.8.7 addresses this requirement.
	9.	The personnel responsible for the training of the fire brigade should be qualified by training and experience for such work.	C.1.a(5)(d)	C	Comply. Subsection 9.5.1.8.2.2 addresses this requirement.
	10.	The following NFPA publications should be used for guidance to develop the fire protection program: No. 4, No. 4A, No. 6, No. 7, No. 8, and No. 27.	C.1.a(6)	C	Alternate Compliance. The NFPA codes cited in BTP CMEB 9.5-1 are historical. Current NFPA codes are referenced for guidance for the fire protection program. Subsection 9.5.1.8.1.1 addresses this requirement.

Table 9.5-201[a] (Sheet 3 of 7)
AP1000 Fire Protection Program Compliance with BTP CMEB 9.5-1

	BTP CMEB 9.5-1 Guideline		Paragraph	Comp	Remarks
PTN COL 9.5-3 PTN COL 9.5-4	11.	On sites where there is an operating reactor, and construction or modification of other units is underway, the superintendent of the operating plant should have a lead responsibility for site fire protection.	C.1.a(7)	C	Comply. Subsection 13.1.1.2.10 addresses this requirement. Units 6 & 7 are sufficiently separated from Units 3 & 4.
	Fire Protection Analysis				
STD COL 9.5-3 STD COL 9.5-4	14.	Fires involving facilities shared between units should be considered.	C.1.b	C	Comply. The FHA demonstrates the plant's ability to perform safe shutdown functions and minimize radioactive releases to the environment. Postulated fires in shared facilities that do not contain SSCs important to safety and do not contain radioactive materials do not affect these functions.
	15.	Fires due to man-made site-related events that have a reasonable probability of occurring and affecting more than one reactor unit should be considered.	C.1.b	C	Comply. Subsections 2.2.3 and 3.5 establish that these events are not credible.
	Fire Suppression System Design Basis				
	22.	Fire protection systems should retain their original design capability for potential man-made, site-related events that have a reasonable probability of occurring at a specific plant site.	C.1.c(4)	C	Comply. Subsections 2.2.3 and 3.5 establish that these events are not credible.
	Fire Protection Program Implementation				
	26.	The fire protection program for buildings storing new reactor fuel and for adjacent fire areas that could affect the fuel storage area should be fully operational before fuel is received at the site.	C.1.e(1)	C	Comply. Subsection 9.5.1.8.1 addresses this requirement.

Table 9.5-201[(a)] (Sheet 4 of 7)
AP1000 Fire Protection Program Compliance with BTP CMEB 9.5-1

		BTP CMEB 9.5-1 Guideline	Paragraph	Comp	Remarks
STD COL 9.5-3 STD COL 9.5-4	27.	The fire protection program for an entire reactor unit should be fully operational prior to initial fuel loading in that unit.	C.1.e(2)	C	Comply. Subsection 9.5.1.8.1 addresses this requirement.
	28.	Special considerations for the fire protection program on reactor sites where there is an operating reactor and construction or modification of other units is under way.	C.1.e(3)	C	Comply. Subsection 9.5.1.8.1.2. m addresses this requirement.
	29.	Establishing administrative controls to maintain the performance of the fire protection system and personnel.	C.2	C	Comply. Subsection 9.5.1.8.1.2 addresses this requirement.
	Fire Brigade				
	30.	The guidance in Regulatory Guide 1.101 should be followed as applicable.	C.3.a	C	Comply. Subsection 9.5.1.8.2.2 addresses this requirement.
PTN COL 9.5-3 PTN COL 9.5-4	31.	Establishing site brigade: minimum number of fire brigade members on each shift; qualification of fire brigade members; competence of brigade leader.	C.3.b	C	Comply. Subsections 9.5.1.8.1.2 and 13.1.2.1.5 address this requirement.
STD COL 9.5-3 STD COL 9.5-4	32.	The minimum equipment provided for the brigade should consist of turnout coats, boots, gloves, hard hats, emergency communications equipment, portable ventilation equipment, and portable extinguishers.	C.3.c	C	Comply. Subsection 9.5.1.8.2.2 addresses this requirement.
	33.	Recommendations for breathing apparatus for fire brigade, damage control, and control room personnel.	C.3.c	C	Comply. Subsection 9.5.1.8.2.2 and DCD Subsections 6.4.2.3 and 6.4.4 address these requirements

Table 9.5-201[a] (Sheet 5 of 7)
AP1000 Fire Protection Program Compliance with BTP CMEB 9.5-1

		BTP CMEB 9.5-1 Guideline	Paragraph	Comp	Remarks
STD COL 9.5-3 STD COL 9.5-4	34.	Recommendations for the fire brigade training program.	C.3.d	C	Comply. Subsection 9.5.1.8.2.2 addresses this requirement.
	Quality Assurance Program				
	35.	Establishing quality assurance (QA) programs by applicants and contractors for the fire protection systems for safety-related areas; identification of specific criteria for quality assurance programs.	C.4	C	Comply. DCD Subsection 9.5.1.7 and Chapter 17 address this requirement.
	Building Design				
	50.	Fire doors should be inspected semiannually to verify that automatic hold-open, release, and closing mechanisms and latches are operable.	C.5.a (5)	C	Comply. Subsection 9.5.1.8.8 addresses this requirement.
	51.	Alternative means for verifying that fire doors protect the door opening as required in case of fire.	C.5.a (5)	C	Comply. Subsection 9.5.1.8.8 addresses this requirement.
	52.	The fire brigade leader should have ready access to keys for any locked fire doors.	C.5.a (5)	C	Comply. Subsection 9.5.1.8.2.2 addresses this requirement.
	55.	Stairwells serving as escape routes, access routes for firefighting, or access routes to areas containing equipment necessary for safe shutdown should be enclosed in masonry or concrete towers with a minimum fire resistance rating of 2 hours and self-closing Class B fire doors.	C.5.A (6)	C	Comply. Subsection 9A.3.3 addresses this requirement for miscellaneous buildings located in the yard.
	56.	Fire exit routes should be clearly marked.	C.5.a (7)	C	Comply. DCD Subsection 9.5.1.2.1.1 addresses this requirement.

Table 9.5-201[(a)] (Sheet 6 of 7)
AP1000 Fire Protection Program Compliance with BTP CMEB 9.5-1

	BTP CMEB 9.5-1 Guideline		Paragraph	Comp	Remarks
STD COL 9.5-3 STD COL 9.5-4	71.	Water drainage from areas that may contain radioactivity should be collected, sampled, and analyzed before discharge to the environment.	C.5.a(14)	C	Comply. Capability is provided. Subsection 9.5.1.8.5 addresses this requirement.
	Control of Combustibles				
	80.	Use of compressed gases inside buildings should be controlled.	C.5.d (2)	C	Comply. Subsection 9.5.1.8.4.g addresses this requirement.
	Lighting and Communication				
PTN COL 9.5-3 PTN COL 9.5-4	111.	A portable radio communications system should be provided for use by the fire brigade and other operations personnel required to achieve safe plant shutdown.	C.5.g (4)	C	Comply. Subsections 9.5.1.8.1.2. a.3.v, 9.5.1.8.2.2, 9.5.2.2.5, and DCD Subsections 9.5.2 and 9.5.2.2.1 address this requirement.
	Water Sprinkler and Hose Standpipe Systems				
STD COL 9.5-3 STD COL 9.5-4	149.	All valves in the fire protection system should be periodically checked to verify position.	C.6.c (2)	C	Comply. Subsection 9.5.1.8.6 addresses this requirement.
	157.	The fire hose should be hydrostatically tested in accordance with NFPA 1962. Hoses stored in outside hose houses should be tested annually. The interior standpipe hose should be tested every 3 years.	C.6.c (6)	C	Comply. Subsection 9.5.1.8.6 addresses this requirement.
	Primary and Secondary Containment				
	174.	Self-contained breathing apparatus should be provided near the containment entrances for fire fighting and damage control personnel. These units should be independent of any breathing apparatus provided for general plant activities.	C.7.a (2)	C	Comply. Subsection 9.5.1.8.2.2 addresses this requirement.
	Main Control Room Complex				

Table 9.5-201[a] (Sheet 7 of 7)
AP1000 Fire Protection Program Compliance with BTP CMEB 9.5-1

	BTP CMEB 9.5-1 Guideline	Paragraph	Comp	Remarks
180.	Breathing apparatus for main control room operators should be readily available.	C.7.b	C	Comply. DCD Subsection 6.4.2.3 addresses this requirement.
Cooling Towers				
STD COL 9.5-3 STD COL 9.5-4 225.	Cooling towers should be of noncombustible construction or so located and protected that a fire will not adversely affect any safety-related systems or equipment.	C.7.q	C	Comply. Subsection 9A.3.3 addresses this requirement.
Storage of Acetylene-Oxygen Fuel Gases				
228.	Gas cylinder storage locations should not be in areas that contain or expose safety-related equipment or the fire protection systems that serve those safety-related areas.	C.8.a	C	Comply. Subsection 9.5.1.8.4.g addresses this requirement.
229.	A permit system should be required to use this equipment in safety-related areas of the plant.	C.8.a	C	Comply. Subsection 9.5.1.8.4.g addresses this requirement.
Storage Areas for Ion Exchange Resins				
230.	Unused ion exchange resins should not be stored in areas that contain or expose safety-related equipment.	C.8.b	C	Comply. Subsection 9.5.1.8.4.a addresses this requirement.
Hazardous Chemicals				
231.	Hazardous chemicals should not be stored in areas that contain or expose safety-related equipment.	C.8.c	C	Comply. Subsection 9.5.1.8.4.h addresses this requirement.

(a) This table supplements DCD Table 9.5.1-1.

Table 9.5-202[a]
Exceptions to NFPA Standard Requirements

	Requirement	AP1000 Exception or Clarification
PTN COL 9.5-4	NFPA 804 (Reference 211) contains requirements specific to light water reactors.	Compliance with portions of this standard is as identified within DCD Section 9.5.1 and WCAP-15871.

(a) This table supplements DCD Table 9.5.1-3.

APPENDIX 9A FIRE PROTECTION ANALYSIS

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

9A.2 FIRE PROTECTION ANALYSIS METHODOLOGY

9A.3 FIRE AREA DESCRIPTION

Add the following information at the end of the first paragraph in DCD Subsection 9A.2.1:

PTN DEP 18.8-1 DCD Figure 9A-3 (Sheet 1 of 3) is modified to reflect the relocation of the Operations Support Center by changing the description of room number 40318 from “ALARA BRIEFING RM AND OPERATIONAL SUPPORT CENTER” to “ALARA BRIEFING RM.”

9A.3.3 YARD AREA AND OUTLYING BUILDINGS

Replace the second sentence of DCD Subsection 9A.3.3 with the following information.

PTN COL 9.5-2 Miscellaneous yard areas do not contain safety-related components or systems, do not contain radioactive materials, and are located such that a fire or effects of a fire, including smoke, do not adversely affect any safety-related systems or equipment. Miscellaneous areas include such structures, for example, as maintenance shops, warehouses, the administrative building, training/office centers, and flammable and combustible material storage tanks. The miscellaneous areas are located outside of the nuclear island, which is separated from the other yard areas by 3-hour fire rated barriers. Fire detection and suppression are provided as determined by the fire hazards analysis and applicable building codes and insurance company loss prevention standards.

The cooling towers are not used as the ultimate heat sink or for fire protection purposes. Therefore, the guidance specified by BTP CMEB 9.5-1 is not applicable, except the cooling towers comply with guidance specified by BTP

CMEB 9.5-1 in that they are so located that a fire will not adversely affect any safety-related systems or equipment (Table 9.5-201, Item 225). The cooling tower serves no safety-related function and has no nuclear safety design basis. The cooling tower does not contain any equipment capable of releasing radioactivity to the atmosphere. The cooling towers, with their circulating water pump structure, are remotely located from HVAC air intakes such that smoke and products of combustion do not affect any safety-related plant areas.

STD COL 9.5-3 Stairwells in miscellaneous buildings located in the yard serving as escape routes or access routes for firefighting, are enclosed in masonry or concrete towers with a minimum fire resistance rating of 2 hours and self-closing Class B fire doors. The two-hour fire-resistance rating for the masonry or concrete material is based on testing conducted in accordance with ASTM E119 (Reference 201) and NFPA 251 (Reference 202).

9A.4 REFERENCES

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201. American Society of Mechanical Engineers, *Standard Test Methods for Fire Tests of Building Construction and Materials*, ASTM E119-08a.

202. National Fire Protection Association, *Standard Methods of Tests of Fire Endurance of Building Construction and Materials*, NFPA 251, 2006.
