CHAPTER 9

AUXILIARY SYSTEMS

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

TABLE OF CONTENTS (Continued)

LIST OF TABLES

LIST OF FIGURES

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.

Add the following subsection after DCD Subsection 9.1.4.3.7.

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.

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

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

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

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

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 tests to monitor changes in physical properties of the absorber material, including neutron attenuation and thickness measurements.

9.2 WATER SYSTEMS

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

9.2.1.2.1 General Description

Replace the third paragraph of DCD subsection 9.2.1.2.1 with the following information.

BLN DEP 9.2-1 A small portion of the service water system (SWS) flow is normally diverted to the waste water system. This blowdown is used to control levels of solids concentration in the SWS. See Figure 9.2-202.

9.2.1.2.2 Component Description

Add the following paragraph at the end of DCD Subsection 9.2.1.2.2, Component Description, Cooling Tower subsection.

BLN SUP 9.2-3 The SWS Cooling Tower is 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.

9.2.5.2.1 General Description

Replace the first and third sentences of the second paragraph of DCD Subsection 9.2.5.2.1 with the following information.

BLN COL 9.2-1 The source of water for the potable water system is the local municipal water supply system. This water supply meets or exceeds the quality requirements in DCD Subsection 9.2.5.1 and the capacity and pressure requirements in DCD Subsection 9.2.5.1.2.

9.2.5.3 System Operation

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

BLN COL 9.2-1 The municipal water supply system provides filtered and disinfected water to the potable water distribution system. The municipal water supply system maintains the required pressure throughout the water distribution system.

9.2.6.2.1 General Description

Replace the final paragraph at the end of DCD Subsection 9.2.6.2.1.

BLN SUP 9.2-1 There is no on-site waste treatment. The waste treatment plant is the local municipal waste treatment plant. Waste is transferred there through the municipal sewer system.

9.2.6.2.2 Component Description

Replace the text under Trunk Line in DCD Subsection 9.2.6.2.2 (to remove the reference to the "site" treatment plant) with:

BLN SUP 9.2-1 The trunk line is the primary line that the sanitary drainage system piping connects into for transport of the sanitary drainage to the treatment plant.

Replace the last sentence under Manholes in DCD Subsection 9.2.6.2.2 (to remove the reference to the "site specific") with:

BLN SUP 9.2-1 Quantity and locations of the manholes are determined by these criteria.

Replace the last sentence under Lift Stations in DCD Subsection 9.2.6.2.2 (to remove the reference to the "site specific") with:

BLN SUP 9.2-1 Quantity and locations of the lift stations are determined by these criteria.

9.2.6.4 Test and Inspection

Replace the paragraph in DCD Subsection 9.2.6.4 (to remove the reference to the "site" specific governing codes) with:

BLN SUP 9.2-1 The sanitary drainage system is tested by water or air and established to be watertight in accordance with the 2006 International Plumbing Code. System inspection is performed in compliance with the 2006 International Plumbing Code.

9.2.6.5 Instrument Application

Replace the text under DCD Subsection 9.2.6.5 (to remove the reference to the "site" treatment plant) with:

BLN SUP 9.2-1 Sufficient instrumentation for operation is provided to monitor and control the transfer to the treatment plant.

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

BLN 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 either the circulating water system or the raw 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.

BLN 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 or raw 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.

BLN CDI The heat sink for the turbine building closed cooling water system is the circulating water system or raw water system. The heat is transferred to the circulating water or raw 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 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

BLN 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. If the circulating water is not in the operation, the TCS can be aligned to reject heat to the raw water system.

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 a 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 bank 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.

BLN CDI The heat exchangers are plate type heat exchangers. Turbine building closed cooling water circulates through one side of the heat exchangers while circulating water or raw water flows through the other side. During system operation, the turbine building closed cooling water in the heat exchangers is maintained at a higher pressure than the circulating water or raw water so leakage of circulating water or raw 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 exchanger 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 may also 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

BLN CDI The turbine building closed cooling water system is placed in operation during the plant startup sequence after cooling water flow from the CWS, or RWS when applicable, is established 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 in the Waste Water Retention Basin portion of DCD Subsection 9.2.9.2.2 with the following text.

BLN COL 9.2-2 The waste water retention basin (WWRB) is located to the southwest of the main plant area, as shown on Figure 1.1-202. The basin is a pond sized such that its contents, dissolved or suspended, do not leach into the ground. The size of the basin provides retention time for settling of solids larger than 10 microns that may be suspended in the waste water stream. The overflow from the retention basin cascades through a series of ponds before being discharged into Town Creek.

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

9.2.11 RAW WATER SYSTEM

BLN SUP 9.2-2 The RWS provides raw strained river water from the Guntersville Reservoir for makeup to the circulating water system (CWS) natural draft cooling tower basins and reservoir treated water to the Standby Service Water mechanical draft cooling tower basins and to the demineralized water treatment system (DTS). The RWS also provides an alternate supply of treated reservoir makeup water to the primary and secondary fire protection system (FPS) water storage tanks. The RWS pumps provide an alternate supply of strained water to the Turbine Building Closed Cooling Water (TCS) Heat Exchangers and dilution flow for liquid radwaste blowdown requirements.

9.2.11.1 Design Bases

9.2.11.1.1 Safety Design Bases

The RWS does not serve a 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. Potential flooding due to failure of the RWS is bounded by the failure of the interfacing systems analyzed in the DCD and the FSAR and does not result in detrimental effects on SSCs important to safety.

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 pumps provide a continuous supply of strained river water from the Guntersville Reservoir for the following service with two of three RWS pumps in service:

- CWS cooling tower basin fill, makeup, and blowdown;
- Provide water for the main raw water pump discharge strainer backwashes and for the screen back wash pump suctions.

The ancillary RWS pumps provide a continuous supply of treated river water from the Guntersville Reservoir for the following services with one of two pumps in service:

- SWS cooling tower basin fill, makeup, and blowdown;
- DTS feed;
- Water for the ancillary water pump granular media filter backwashes; and
- An alternate supply of water for screen back wash pump operation.

RWS piping provides:

- Piping connection to the municipal water supply for normal filling and makeup to the fire protection system (FPS) primary and secondary fire water storage tanks.
- Piping to provide an alternate makeup supply of treated river water to the FPS primary and secondary fire water storage tanks.

The ancillary RWS pumps provide inventory and SWS make-up flow to support normal plant cooldown.

9.2.11.1.2.2 Outage Mode Operation

During plant outages; one RWS pump may be left in service to provide alternate cooling to the Turbine Building Closed Cooling Water System (TCS) Heat Exchanger and provide an alternate dilution source for radwaste discharge when the CWS is not available.

9.2.11.2 System Description

The RWS is shown in Figure 9.2-201. Classification of components and equipment for the RWS is given in Section 3.2.

The water source for the RWS is TVA Guntersville Reservoir fed by the Tennessee River.

Water is drawn through an intake channel which extends from the river to an intake structure (Raw Water Intake Pumping Station). The intake channel is protected by a floating boom to prevent large floating debris from reaching the intake structure. The intake structure is divided into two independent sections for Unit 3 and Unit 4. For reliability, each section has two independent basins, “Basin A” and “Basin B”, from which water is drawn. The intake structure is equipped with trash rakes and traveling screens. Refer to Subsection 2.4.1.2.3.2 for additional details pertinent to the Raw Water Intake Pumping Station.

The RWS equipment located at the raw water pumping station for each unit consists of three RWS pumps and automatic strainers and their drivers, two diesel-backed ancillary water pumps and filters with their drivers, screen wash pumps and their drivers for the traveling screens, electrical power feed equipment, and appropriate instrumentation and controls for the system. Basin A contains two RWS pumps and one ancillary RWS pump and Basin B contains one RWS pump and an ancillary RWS pump. Each RWS pump has sufficient capacity to provide 50% of the maximum raw water demand for a single unit. The RWS pumps can also be used during outages to provide alternate dilution flow for Liquid Radwaste (WLS) discharge if dilution flow requirements are high. The ancillary pumps are sized to provide maximum design flow to support all modes of plant operation. Anti-siphon protection is provided to prevent draining the SWS cooling tower basins through the ancillary RWS supply piping.

The underground RWS piping is designed to ASME Standard B31.1 requirements and is protected from external corrosion.

The flow path for the functions described in the power generation design basis is from the Guntersville Reservoir, through trash rakes, intake screens and into the basins where the water is available for distribution. The RWS pumps discharge through strainers into a common distribution header for each unit. The ancillary RWS pumps discharge into a common header to a multi-unit media filter through an ultraviolet (UV)/oxidation subsystem and activated charcoal bed to a distribution header for each unit. A bypass is provided for the multi-media filter, UV/oxidation subsystem, and activated charcoal bed.

The RWS water is treated, as necessary, to provide source water of suitable quality to the Demineralized Water Treatment System and the Standby Service Water System. This water has suspended solids less than 1000 ppb and a pH between 5.8 to 7.5. Additionally, the RWS provides strained water for makeup to the Circulating Water System.

The RWS provides a piping connection to the municipal water supply for filling and makeup to the primary and secondary fire water storage tanks. A normally closed connection provides a backup supply for filling the fire water storage tanks with raw filtered river water by the ancillary RWS pumps.

SWS has investment protection short-term availability controls as described in DCD Table 16.3-2, which are applicable in MODE 5 with the RCS pressure boundary open and in MODE 6 with the upper internals in place or cavity level less than full. Under these conditions, SWS is directly providing active core cooling and meets the RTNSS criteria. Unlike SWS, RWS does not directly provide core cooling, does not meet the RTNSS criteria and does not require investment protection short-term availability controls. Ancillary RWS provides makeup water to the SWS basins.

9.2.11.2.1 Component Description

Intake

The raw water intake structure supports the pumps and related equipment (i.e. intake screens, screen wash pumps, etc) for the RWS. The intake structure has 2 basins for each unit, Basin A has two RWS pumps and an ancillary RWS pump and Basin B has one RWS pump and one ancillary RWS pump. Each basin is equipped with a traveling screen and trash rake.

Trash Rake

A rake is located at the entrance to each of the two basins downstream from the boom and upstream of the traveling screens. The rake is to prevent debris from entering the basins. The rakes are constructed in sections that are removable for washing, inspection and repair.

Traveling Screen

Traveling screens are located at the inlet of the basins downstream of the rakes and provide screening of floating and suspended solids that may be present in the river water. Additionally, the screens minimize aquatic life in the water entering the basin area. The screens are sized so that the through screen velocity is less than 0.5 feet per second to reduce impingement mortality of aquatic biota. Buildup of debris on the screens is washed off with low pressure spray water sluiced back to the reservoir. Each traveling screen is powered by an electric motor fed from normal ac power with backup power feed from diesel generators.

RWS Pumps

Three 50% capacity RWS pumps draw water from the Guntersville Reservoir to supply the required flow for the services and functions listed in Subsection 9.2.11.1.2. The pumps are vertical, centrifugal, constant speed electric motor driven pumps. They are powered from the normal ac power system. The length of each pump barrel is sized to meet minimum submergence and net positive suction head requirements during low and high reservoir level conditions. The standby RWS pump is normally isolated from the discharge header by a motor-operated valve. On a loss of normal ac power, the motor-operated valves are equipment with a handwheel for manual positioning, if required. Each pump is equipped with a pressure switch on the discharge piping that alarms on low pressure. A pressure switch on the discharge header automatically starts the standby pump on low discharge header pressure.

Ancillary RWS Pumps

Two 100% capacity ancillary RWS pumps are provided to draw water from the Guntersville Reservoir. One pump provides normal makeup requirements for the services and functions listed in Subsection 9.2.11.1.2 during normal plant operations. One ancillary RWS pump is on standby. The ancillary RWS pumps are vertical, centrifugal, constant speed electric motor driven pumps. They are powered from the normal ac power system. Non-safety related diesel generators provide backup power for these pumps and their discharge valves and other required support equipment. The length of each pump barrel is sized to meet the minimum submergence and net positive suction head requirements during low and high reservoir level conditions. The standby ancillary RWS pump is normally isolated from the discharge header by a motor-operated valve. On a loss of normal ac power, the motor-operated valves are equipment with a handwheel for manual positioning. Each pump is equipped with a pressure switch on the discharge piping that alarms on low pressure. A pressure switch on the discharge header automatically starts the standby pump on low discharge header pressure.

Screen Wash Pumps

Two screen wash pumps per unit draw strained water from the RWS pump discharge flow and provide spray water to remove debris and fish from the traveling screens. The screen wash pumps are powered by electric motors fed from the normal ac power system with backup power from the diesel generators. An alternate supply of water is provided by the ancillary RWS pumps during a loss of normal ac power.

Automatic Strainers

Three 50% rotary basket type strainers are located in the RWS pump discharge lines. Automatic valves facilitate cleaning the strainers by backwashing the basket and flushing the strainer. The wash water from the cleaning sequence is discharged to the reservoir. The strainer baskets are rotated by electric motors powered from the normal ac power system.

Granular Media Filters

Multiple granular media filter units are located upstream of the supply feeds to the SWS cooling towers, and the DTS in the common discharge header for the ancillary RWS pumps. The filter consists of multiple units, with a minimum of one unit in backwash mode or on standby. The filters are periodically backwashed and the wash water is discharged to the reservoir. A bypass is provided around the filter for operational flexibility.

Ultraviolet (UV)/Oxidation Subsystem

In-line ultraviolet light sources are located downstream of the granular media filters where low turbidity conditions exist to achieve highly effective UV irradiation of bacteria. This UV light treatment is augmented with the use of hydrogen peroxide to further assist in elimination of bacteriological material, and also to eradicate any larval stage Zebra mussel clams and other biota which may be present in the raw water.

Activated Charcoal Beds

Activated charcoal filters are located downstream of the UV/oxidation subsystem in order to remove any organic compounds from the raw water. In addition, activated charcoal reduces the levels of residual peroxide. The charcoal filters are periodically backwashed and the wash water discharged to the reservoir.

Piping

The discharges of the RWS pumps and ancillary RWS pumps are routed to separate headers. Discharge check valves on the RWS pumps and ancillary RWS pumps limit reverse flow in the piping if pumps are tripped and restarted. 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. The system is designed so that high points do not lead to the formation of vapor voids upon loss of system pumping. Air release valves are provided in the piping at the pump discharges to vent air on pump start.

Valves

Motor operated valves are located on the discharge of each RWS and ancillary raw water pump. They are supplied from the normal ac power system in each unit. The pump discharge valves are motor-operated and are designed to fail "as-is" during a loss of normal ac power condition. The discharge valves for the ancillary raw water pumps have backup power feed from diesel generators. Air operated valves are designed to close on a loss of normal ac power. Handwheels on valve operators allow repositioning of the valves locally on loss of power.

9.2.11.3 System Operation

The RWS operates during normal modes of plant operation, including startup, power operation (full and partial loads), cooldown, shutdown and refueling. Makeup flow to the CWS is not normally required after the plant is shutdown. The RWS pumps are not available during a loss of normal ac power, but the ancillary RWS pumps have a backup power supply from the non-safety related diesel generators to provide SWS makeup requirements. The RWS pumps are used to fill the CWS cooling tower basin, and the ancillary RWS pumps fill the SWS cooling tower basins following an outage, if required.

9.2.11.3.1 Plant Startup

During plant startup, one RWS pump supplies strained water to the CWS cooling tower basin to fill the CWS piping and to replace evaporative losses as the CWS cooling tower is placed into operation. The ancillary RWS pump provides river water to the media filters for treatment before being directed to the SWS cooling tower basins.

9.2.11.3.2 Power Operation

During normal operation, two RWS pumps normally supply strained water to the CWS cooling tower basin. A third pump remains in standby. One ancillary RWS pump provides filtered water to the SWS cooling tower basins and makeup to the DTS. One ancillary RWS pump remains in standby.

9.2.11.3.3 Plant Cooldown/Shutdown

The plant cooldown/shutdown operation uses the same system alignment as with normal power operation. As the plant approaches cold shutdown and the heat rejection from the CWS cooling tower decreases, one RWS pump will be stopped and placed in standby. The remaining RWS pump will continue in operation to support normal cooldown and may be used as an alternate source of cooling water to the TCS.

The ancillary RWS pumps will be used as necessary to provide SWS cooling water to support normal cooldown of the unit, in Mode 5 with the RCS pressure boundary open and in Mode 6 with the upper internals in place or cavity level less than full, and other cooldown requirements.

9.2.11.3.4 Refueling

Normally, RWS pumps are not used during refueling. One ancillary RWS pump provides the required RWS supply of filtered water with one ancillary RWS pump in standby. A RWS pump may be used for dilution of WLS discharge if the dilution capacity requirement is high and a discharge is required.

9.2.11.3.5 Loss of Normal AC Power Operation

In the event of a loss of normal ac power, the ancillary RWS pumps, valves, filters, backwash pumps, traveling screens, and the instrumentation associated with pump discharge pressure, intake bay level, and screen wash pump discharge pressure are loaded onto their assigned non-safety related diesel buses. The pumps, filters, and traveling screens are restarted locally. The flow control valve on the ancillary RWS make-up line to the service water cooling tower basins isolates on a loss of normal ac power and will be manually opened. The major piping runs are underground which, together with the check valves on the discharge of the ancillary RWS pumps prevents the formation of voids in the make-up line and transient water hammer conditions when the pumps are restarted providing makeup flow to the SWS cooling tower basins. Administrative procedures will govern the restarting of the ancillary RWS pumps in a loss of normal ac power condition.

9.2.11.4 Safety Evaluation

The RWS does not have a safety-related function and, therefore, does not require a nuclear safety evaluation. The RWS does not have the potential to be a flow path for radioactive fluids. The RWS operates at a higher system pressure than those systems with which it directly interfaces (at the point of interface) and, therefore, in-leakage is not feasible. The WLS discharge effluent is connected to the CWS cooling tower blowdown line. Per DCD 11.2.3.3, the WLS effluent is released offsite through a dilution flow stream. Dilution flow is available from RWS to the CWS cooling tower makeup during normal power and shutdown conditions.

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 are demonstrated by operation of the system, monitoring of system parameters such as flow and pressure, and visual inspection. Administrative procedures provide direction for operation of the system under all modes of required operation.

Vendor information, with consideration of industry and actual system operating experience, is used to determine preventive maintenance testing requirements.

9.2.11.6 Instrumentation Applications

Basin level indications are provided to alert operators of system problems with the traveling screens or stop logs. Trouble alarms are used by the operators to identify component failures and initiate actions. Power actuated valves in the RWS are provided with valve position indication. Pump discharge pressure instrumentation is provided and pressure switches automatically start the standby RWS pump on low header pressure.

STD DEP 1.1-1

9.2.12 COMBINED LICENSE INFORMATION

9.2.12.1 Potable Water

BLN COL 9.2-1

This COL item is addressed in Subsections 9.2.5.2.1 and 9.2.5.3.

9.2.12.2 Waste Water Retention Basins

BLN COL 9.2-2

This COL item is addressed in Subsection 9.2.9.2.2.

STD DEP 1.1-1

9.2.13 REFERENCES

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

STD COL 9.4-1a Add the following text at the end of DCD subsection 9.4.1.4.

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.

9.4.7.4 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.

BLN 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

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201. ASME/ANSI AG-1a-2000, Addenda to ASME AG-1-1997 Code on Nuclear Air and Gas Treatment, Section HA, “Housings.”

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.

BLN SUP 9.5-2 The fire water tanks are sampled if river water is used as makeup to the fire water tanks. Appropriate actions such as chemical treatment or system flushing are taken to prevent or control bio-fouling and microbiologically-induced corrosion of the fire water system.

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

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

b. 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.

c. Designing and selecting equipment related to fire protection.

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

e. 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.

f. Developing and conducting the fire extinguisher training program.

g. 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.

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

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

j. 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.

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

l. 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.

m. 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.

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

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

The responsibilities of the engineer in charge of fire protection and his staff are discussed in Subsection 13.1.2.1.2.9.

9.5.1.8.2 Fire Brigade

9.5.1.8.2.1 General

The organization of the fire brigade is discussed in Subsection 13.1.2.1.5.

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 Reference 9.5.5.2) 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

STD 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 13.1.2.1.2.9.

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.

9.5.1.9 Combined License Information

STD DEP 1.1-1

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.

9.5.1.9.2 Fire Protection Analysis Information

BLN COL 9.5-2

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 subsections at the end of DCD Subsection 9.5.2.2.3.

9.5.2.2.3.1 Off-site Interfaces

BLN COL 9.5-9 The off-site communications network is used to communicate with federal, state, and other supporting agencies. Access to these agencies is provided through several redundant and diverse routes. This diversity is achieved by off-site routing through more than one type of facility. These facilities include, but are not limited to:

- Commercial facilities such as central office trunks.
- Tie lines and digital services.
- Privately-owned and maintained microwave and fiber optic systems.

The off-site telecommunications network is designed to facilitate traffic in the most fail-safe manner to the emergency response organizations.

Telecommunications services are provided between the following locations in a redundant and diverse manner:

- Central Emergency Control Center (CECC) to State Emergency Management Agencies.
- CECC to other nuclear sites in the TVA system.
- State Emergency Management Agencies to County Emergency Management Agencies.

In addition to the above-listed emergency response organizations, the following emergency centers are also equipped with public telephone lines:

- Joint Information Centers
- Field Coordination Centers

Emergency Off-site Communications, which include Emergency Notification System (ENS) and Health Physics Network (HPN), are described in Subsection 9.5.2.2.3.2.

The installation of the ENS, if it is connected through a local telephone company switch, requires a station package. The station package is designed, installed, and maintained at the site. The design provides a functional ENS from the site to the NRC Operations Center in the event of a loss of off-site power at the site and is in compliance with the requirements of NRC Bulletin 80-15 for the ENS.

The ENS and HPN are the primary systems for communication with the NRC. The emergency communication links between the facility and the NRC headquarters are tested monthly per the following matrix:

From	To NRC Headquarters
Control Room	ENS only
Technical Support Center	ENS and HPN
Emergency Operations Facility	ENS and HPN

The communications between the site and the appropriate Regional NRC office is completed through the NRC Headquarters Operations Center. Testing of the communications link between the NRC Headquarters Operations Center and the Regional office is the responsibility of the NRC.

9.5.2.2.3.2 Emergency Off-site Communications

BLN COL 9.5-10 The Technical Support Center (TSC) is the primary on-site communication center for the communications to the control room, the Operations Support Center

(OSC), the Emergency Operations Facility (EOF), and the NRC. In addition, provisions for communication with state and local operations centers also are provided in the TSC to initiate early notification and recommendations to off-site authorities prior to activation of the EOF.

The communication interfaces to off-site locations consist of dedicated telephone lines and emergency radios. This design conforms with NUREG-0696, “Functional Criteria for Emergency Response Facilities” and the recommendations of Regulatory Issue Summary RIS 2000-11, “NRC Emergency Telecommunications System”. The relationship of these interfaces is shown in Figure 9.5-201.

9.5.2.2.3.2.1 Dedicated Telephone Lines

The following dedicated telephone system links are provided for essential communication functions:

a. NRC Emergency Telecommunications System - The system consists of the following dedicated Federal Telephone System circuits (NRC FTS 2100 System) to provide direct communication with the NRC Operations Center:

    1. ENS is used to provide initial notification to, and ongoing communication with the NRC personnel in an emergency. The ENS is available in the control room, TSC and EOF.

    2. HPN is used to provide radiological and meteorological information to the NRC in an emergency. The HPN is available in the TSC and EOF.

    3. Reactor safety counterpart link (RSCL) is used by the NRC site team and the NRC base team to conduct internal NRC discussions on plant parameters without interfering with exchange of information between the nuclear plant and the NRC. The RSCL is available in the TSC and EOF.

    4. Protective measures counterpart link (PMCL) may be used by the NRC site team and the NRC base team to conduct internal discussions on radiological releases and meteorological conditions, and the need for protective actions without interfering with exchange of information between the nuclear plant and the NRC. The PMCL is available in the TSC and EOF.

    5. Management Counterpart Link (MCL) may be used for any internal discussions between the NRC Executive Team Director and the NRC Director of site operations. The MCL is available in the TSC and EOF.

6. Emergency response data system (ERDS) may be used to transmit reactor process variables and radiological and site meteorological data from the nuclear plant computer systems to the NRC operations center. The ERDS is activated by the nuclear plant at an 'Alert or higher' declaration. The ERDS is available in the control room.

7. Operations center local area network (OCL) access may be used by the NRC base team and the NRC site team to access products and services provided on the NRC operations center's local area network. The OCL is available in the TSC and EOF.

b. ERDS and OCL links are analog phone lines.

1. The operational hot line connects to the facilities listed in Table 9.5-203. The operational hot line is used for initial notification and ongoing communications to the locations listed in Table 9.5-203 for the duration of the emergency. Utilization of the line by the plant activates the emergency response network by notifying each location simultaneously.

2. The ENS has the capability to notify emergency response and backup personnel that an event has occurred, and to respond in accordance with the emergency response procedures. The system is secure in order to prevent inadvertent operation, and the system can be activated for any emergency classification at the points of control of the emergency.

The computerized emergency notification system is located in the EOF. In the event of loss of normal power, the notification system is powered from an emergency diesel generator located at the EOF.

9.5.2.2.3.2.2 VHF Radio System (Crisis Management Radio System)

The emergency radio communication system serves as an alternate means of communications to notify local authorities of an emergency at the nuclear plant. Radios connect the following facilities:

- Control Room/TSC/EOF (See Table 9.5-203)
- Local Authorities (See Emergency Plan)

The emergency radio communications system connects on-site and off-site monitoring teams with the OSC and EOF respectively.

Radios are issued to OSC emergency response teams to connect them to the OSC.

9.5.2.5 Combined License Information

9.5.2.5.1 Offsite Interfaces

BLN COL 9.5-9 This COL Item is addressed in Subsection 9.5.2.2.3.1

9.5.2.5.2 Emergency Offsite Communications

BLN COL 9.5-10 This COL Item is addressed in Subsection 9.5.2.2.3.2

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 4176. In addition, kinetic 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

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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.

STD COL 9.5-3
STD COL 9.5-4

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			
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.
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, 13.1.2.1.2.9 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. Prefire planning.	C.1.a(3)	C	Comply. Subsection 13.1.2.1.2.9 addresses this requirement.

STD COL 9.5-3
STD COL 9.5-4

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
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, 13.1.2.1.2.9, 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 13.1.2.1.2.9 addresses this requirement.
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.

STD COL 9.5-3
STD COL 9.5-4

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
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.
Fire Protection Analysis				
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.

STD COL 9.5-3
STD COL 9.5-4

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
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.
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. Subsection 9.5.1.8.2.2 and 13.1.2.1.5 address this requirement.
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 Subsection 6.4.3.1 address these requirements
34.	Recommendations for the fire brigade training program.	C.3.d	C	Comply. Subsection 9.5.1.8.2.2 addresses this requirement.

STD COL 9.5-3
STD COL 9.5-4

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
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.
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.

STD COL 9.5-3
STD COL 9.5-4

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
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				
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, and DCD Subsections 9.5.2 and 9.5.2.2.1 address this requirement.
Water Sprinkler and Hose Standpipe Systems				
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				
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.

STD COL 9.5-3
STD COL 9.5-4

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
Cooling Towers				
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.

STD COL 9.5-4

TABLE 9.5-202[a]
EXCEPTIONS TO NFPA STANDARD REQUIREMENTS

Requirement	AP1000 Exception or Clarification
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. The intake structure is non-combustible construction, does not provide any safety function, and does not contain any equipment important to safety. Automatic sprinkler protection is not warranted and is not provided.

a) This table supplements DCD Table 9.5.1-3.

BLN COL 9.5-10

TABLE 9.5-203
OPERATIONAL HOT LINE

LOCATION	CONTACT	ALTERNATE CONTACT
Control Room	Control Room Communicator	Control Room Operator
Technical Support Center	TSC Communicator	Alt. TSC Communicator
Emergency Operations Facility	EOF Communicator	Alt. EOF Communicator

APPENDIX 9A
FIRE PROTECTION ANALYSIS

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

9A.2.1 Fire Area Description

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

BLN DEP 18.8-1 Figure 9A-201 replaces DCD Figure 9A-3 (Sheet 1) to reflect the relocation of the Operations Support Center.

9A.3.3 Yard Area and Outlying Buildings

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

BLN 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 intake structure is non-safety-related, does not contain any safety-related equipment, and is remotely located from safety-related structures, systems and components. 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. Water-based fire suppression systems are supplied by a branch line from the underground yard loop.

The cooling tower is not used as the ultimate heat sink or for fire protection purposes. Therefore, the guidance specified in BTP CMEB 9.5-1 is not applicable. The cooling tower serves no safety function and has no safety design basis. The cooling tower does not contain any equipment capable of releasing radioactivity to the atmosphere. The cooling tower fill is a PVC material with a flame spread rating of 25 or less. There are limited combustibles located in the circulating water pump house. The combustible loading is estimated to be less than one hour, the major contributor being cable insulation. In accordance with DCD Appendix 9A.2.4, for a combustible loading of up to 80,000 BTU/ft^2 (≤ one hour), manual suppression and fire detection are required. A fire in the pump house is detected by a fire detection system which produces an audible alarm locally and both visual and audible alarms in the main control room and the security central alarm station. Portable extinguishers are provided in the pump house for manual suppression. The cooling tower is 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

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.
