

NFPA 805 Chapter 3 – 10 CFR 50.48(c)(2)(vii) (LAR Attachment L) Requests

Summary of NFPA 805 sections recommend rulemaking to allow performance based approaches:

- Section 3.2.3 Procedures: This includes sections (1) through (6)
- Section 3.3 Prevention all sections: Combustible controls, hot work, Structural and fire barrier integrity, Interior finishes, insulation, control of ignition sources, electrical, roofing, bulk storage, etc.
- Section 3.5 Water Supply
- Section 3.6 Standpipe and Hose Stations
- Section 3.7 Fire Extinguishers

Those sections below are currently allowed to be performance based:

- Section 3.8 Fire Alarm and detection Systems
- Section 3.9 Automatic and Manual Water Based Fire Suppression Systems
- Section 3.10 Gaseous Fire Suppression Systems
- Section 3.11 Passive Fire Protection Features

Summary of NFPA 805, Chapter 3 Related, 10 CFR 50.48(c)(2)(vii) (LAR Attachment L) Requests

Chapter 3 Fundamental Fire Protection Program and Design Elements	Att. L Requests	Performance based approach previously approved by NRC? (yes/no)	Recommendation to allow PB approach?
<p>3.1* General. This chapter contains the fundamental elements of the fire protection program and specifies the minimum design requirements for fire protection systems and features. These fire protection program elements and minimum design requirements shall not be subject to the performance-based methods permitted elsewhere in this standard. Previously approved alternatives from the fundamental protection program attributes of this chapter by the AHJ take precedence over the requirements contained herein.</p>	None	No	No
<p>3.2 Fire Protection Plan. 3.2.1 Intent. A site-wide fire protection plan shall be established. This plan shall document management policy and program direction and shall define the responsibilities of those individuals responsible for the plan's implementation. This section establishes the criteria for an integrated combination of components, procedures, and personnel to implement all fire protection program activities.</p>	None	No	No
<p>3.2.2* Management Policy Direction and Responsibility. A policy document shall be prepared that defines management authority and responsibilities and establishes the general policy for the site fire protection</p>	None	No	No

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program.			
3.2.2.1* The policy document shall designate the senior management position with immediate authority and responsibility for the fire protection program.	None	No	No
3.2.2.2* The policy document shall designate a position responsible for the daily administration and coordination of the fire protection program and its implementation.	None	No	No
3.2.2.3* The policy document shall define the fire protection interfaces with other organizations and assign responsibilities for the coordination of activities. In addition, this policy document shall identify the various plant positions having the authority for implementing the various areas of the fire protection program.	None	No	No
3.2.2.4* The policy document shall identify the appropriate AHJ for the various areas of the fire protection program.	None	No	No
3.2.3* Procedures. Procedures shall be established for implementation of the fire protection program. In addition to procedures that could be required by other sections of the standard, the procedures to accomplish the following shall be established: (1) * Inspection, testing, and maintenance for fire protection systems and features credited by the fire protection program (2) * Compensatory actions implemented when fire protection systems and other systems credited by the fire protection program and this standard cannot perform their intended function and limits on impairment duration (3) * Reviews of fire protection program — related performance and trends (4) Reviews of physical plant modifications and procedure changes for impact on the fire protection program (5) Long-term maintenance and configuration of the fire protection program (6) Emergency response procedures for the plant industrial fire brigade.	Brunswick - 3.2.3(1) Callaway - 3.2.3(1) Cooper - 3.2.3(1) DC Cook - 3.2.3(1) Duane Arnold - 3.2.3(1) Farley - 3.2.3(1) Nine Mile Point 1 - 3.2.3(1) Palisades - 3.2.3(1) Turkey Point - 3.2.3(1) VC Summer – 3.2.3(1) ANO-1 - 3.2.3(1)	Yes	Yes

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	Browns Ferry - 3.2.3(1) Calvert Cliffs - 3.2.3(1) Catawba - 3.2.3(1) Diablo Canyon - 3.2.3(1) McGuire - 3.2.3(1) Point Beach - 3.2.3(1) Robinson - 3.2.3(1) St. Lucie - 3.2.3(1)		
<p>3.3 Prevention. A fire prevention program with the goal of preventing a fire from starting shall be established, documented, and implemented as part of the fire protection program. The two basic components of the fire prevention program shall consist of both of the following:</p> <p>(1) Prevention of fires and fire spread by controls on operational activities (2) Design controls that restrict the use of combustible materials</p> <p>The design control requirements listed in the remainder of this section shall be provided as described.</p>	None	No	Yes, Section 3.3
<p>3.3.1 Fire Prevention for Operational Activities. The fire prevention program activities shall consist of the necessary elements to address the control of ignition sources and the use of transient combustible materials during all aspects of plant operations. The fire prevention program shall focus on the human and programmatic elements necessary to prevent fires from starting or, should a fire start, to keep the fire as small as possible.</p>	None	No	Yes, Section 3.3
<p>3.3.1.1 General Fire Prevention Activities. The fire prevention activities shall include but not be limited to the following program elements:</p> <p>(1) Training on fire safety information for all employees and contractors including, as a minimum, familiarization with plant fire prevention procedures, fire reporting, and plant emergency alarms</p>	None	No	Yes, Section 3.3

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<p>(2) * Documented plant inspections including provisions for corrective actions for conditions where unanalyzed fire hazards are identified</p> <p>(3) * Administrative controls addressing the review of plant modifications and maintenance to ensure that both fire hazards and the impact on plant fire protection systems and features are minimized.</p>			
<p>3.3.1.2* Control of Combustible Materials. Procedures for the control of general housekeeping practices and the control of transient combustibles shall be developed and implemented. These procedures shall include but not be limited to the following program elements:</p> <p>(1) * Wood used within the power block shall be listed pressure-impregnated or coated with a listed fire-retardant application. Exception: Cribbing timbers 6 in. by 6 in. (15.2 cm by 15.2 cm) or larger shall not be required to be fire-retardant treated.</p> <p>(2) Plastic sheeting materials used in the power block shall be fire-retardant types that have passed NFPA 701, Standard Methods of Fire Tests for Flame Propagation of Textiles and Films, large-scale tests, or equivalent.</p> <p>(3) Waste, debris, scrap, packing materials, or other combustibles shall be removed from an area immediately following the completion of work or at the end of the shift, whichever comes first.</p> <p>(4) * Combustible storage or staging areas shall be designated, and limits shall be established on the types and quantities of stored materials.</p> <p>(5) * Controls on use and storage of flammable and combustible liquids shall be in accordance with NFPA 30, Flammable and Combustible Liquids Code, or other applicable NFPA standards.</p> <p>(6) * Controls on use and storage of flammable gases shall be in accordance with applicable NFPA standards.</p>	<p>Cooper – 3.3.1.2(1) Fort Calhoun – 3.3.1.2(1) & 3.3.1.2(3) Oconee – 3.3.1.2(1) Palisades – 3.3.1.2(2) & 3.3.1.2(3) VC Summer – 3.3.1.2(1)</p>	<p>Yes, Note that Fort Calhoun determined that 3.3.1.2(3) complies based on RAI responses. This item ins not PB</p>	<p>Yes, Section 3.3</p>
<p>3.3.1.3 Control of Ignition Sources. 3.3.1.3.1* A hot work safety procedure shall be developed, implemented, and periodically updated as necessary in accordance with NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, and NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.</p>	<p>Palisades Calvert Cliffs Waterford</p>	<p>Yes, Note that Palisades describes a Hot Work Procedure. Not sure why they are not stating complies.</p>	<p>Yes, Section 3.3</p>
<p>3.3.1.3.2 Smoking and other possible sources of ignition shall be restricted to properly designated and supervised safe areas of the plant.</p>	<p>None</p>	<p>No</p>	<p>Yes, Section 3.3</p>
<p>3.3.1.3.3</p>	<p>None</p>	<p>No</p>	<p>Yes, Section 3.3</p>

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Open flames or combustion-generated smoke shall not be permitted for leak or air flow testing.			
3.3.1.3.4* Plant administrative procedure shall control the use of portable electrical heaters in the plant. Portable fuel-fired heaters shall not be permitted in plant areas containing equipment important to nuclear safety or where there is a potential for radiological releases resulting from a fire.	Ginna	No, Two fuel fired heaters used to keep traveling screens warm	Yes, Section 3.3
3.3.2 Structural. Walls, floors, and components required to maintain structural integrity shall be of noncombustible construction, as defined in NFPA 220, Standard on Types of Building Construction.	None	No	Yes, Section 3.3
3.3.3 Interior Finishes. Interior wall or ceiling finish classification shall be in accordance with NFPA 101®, Life Safety Code®, requirements for Class A materials. Interior floor finishes shall be in accordance with NFPA 101 requirements for Class I interior floor finishes.	ANO-2 Cooper Duane Arnold Palisades Turkey Point ANO-1 Browns Ferry Point Beach St. Lucie	Yes - Epoxy floor coatings - Epoxy floor coatings were reviewed under CR 2007-25587 and determined to meet the requirements contained in GL 86-10 (no more than 1/8" thick with flame spread of 50 or less). This is not the same as the requirements from NFPA 805.	Yes, Section 3.3
3.3.4 Insulation Materials. Thermal insulation materials, radiation shielding materials, ventilation duct materials, and soundproofing materials shall be noncombustible or limited combustible.	None	No	Yes, Section 3.3
3.3.5 Electrical. 3.3.5.1 Wiring above suspended ceiling shall be kept to a minimum. Where installed, electrical wiring shall be listed for plenum use, routed in armored cable, routed in metallic conduit, or routed in cable trays with solid metal top and bottom covers.	ANO-2 Callaway Cooper Farley Fort Calhoun Nine Mile Point 1 Oconee Palisades VC Summer Turkey Point ANO-1 Beaver Valley	Yes video/communication/data cables above any of the suspended ceiling that were field routed Cable trays above the suspended ceiling in the Control Room are not solid bottom and do not have tray covers except	Yes, Section 3.3

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	Browns Ferry Calvert Cliffs Catawba Diablo Canyon Ginna McGuire Point Beach Robinson St. Lucie Waterford	for low level signal cables which have solid bottoms and solid tray covers. 120VAC or 125 VDC	
<p>3.3.5.2 Only metal tray and metal conduits shall be used for electrical raceways. Thin wall metallic tubing shall not be used for power, instrumentation, or control cables. Flexible metallic conduits shall only be used in short lengths to connect components.</p>	ANO-2 Cooper Duane Arnold Palisades Turkey Point ANO-1 Catawba Diablo Canyon McGuire Point Beach Robinson St. Lucie Waterford	Yes	Yes, Section 3.3
<p>3.3.5.3* Electric cable construction shall comply with a flame propagation test as acceptable to the AHJ.</p> <p>Exception: Existing cable in place prior to the adoption of this standard shall be permitted to remain as is.</p>	Oconee Palisades Ginna Waterford	Yes	Yes, Section 3.3
<p>3.3.6 Roofs. Metal roof deck construction shall be designed and installed so the roofing system will not sustain a self-propagating fire on the underside of the deck when the deck is heated by a fire inside the building. Roof coverings shall be Class A as determined by tests described in NFPA 256, Standard Methods of Fire Tests of Roof Coverings.</p>	None	No	Yes, Section 3.3
<p>3.3.7 Bulk Flammable Gas Storage.</p>	None	No	Yes, Section 3.3

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Bulk compressed or cryogenic flammable gas storage shall not be permitted inside structures housing systems, equipment, or components important to nuclear safety.			
3.3.7.1 Storage of flammable gas shall be located outdoors, or in separate detached buildings, so that a fire or explosion will not adversely impact systems, equipment, or components important to nuclear safety. NFPA 50A, Standard for Gaseous Hydrogen Systems at Consumer Sites, shall be followed for hydrogen storage.	Oconee Point Beach	Yes	Yes, Section 3.3
3.3.7.2 Outdoor high-pressure flammable gas storage containers shall be located so that the long axis is not pointed at buildings.	Cooper Palisades VC Summer Calvert Cliffs Diablo Canyon	Yes	Yes, Section 3.3
3.3.7.3 Flammable gas storage cylinders not required for normal operation shall be isolated from the system.	None		Yes, Section 3.3
3.3.8 Bulk Storage of Flammable and Combustible Liquids. Bulk storage of flammable and combustible liquids shall not be permitted inside structures containing systems, equipment, or components important to nuclear safety. As a minimum, storage and use shall comply with NFPA 30, Flammable and Combustible Liquids Code.	Turkey Point Diablo Canyon	Yes	Yes, Section 3.3
3.3.9* Transformers. Where provided, transformer oil collection basins and drain paths shall be periodically inspected to ensure that they are free of debris and capable of performing their design function.	None	No	Yes, Section 3.3
3.3.10* Hot Pipes and Surfaces. Combustible liquids, including high flashpoint lubricating oils, shall be kept from coming in contact with hot pipes and surfaces, including insulated pipes and surfaces. Administrative controls shall require the prompt cleanup of oil on insulation.	None	No	Yes, Section 3.3
3.3.11 Electrical Equipment Adequate clearance, free of combustible material, shall be maintained around energized electrical equipment.	None	No	Yes, Section 3.3

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<p>3.3.12* Reactor Coolant Pumps. For facilities with non-inerted containments, reactor coolant pumps with an external lubrication system shall be provided with an oil collection system. The oil collection system shall be designed and installed such that leakage from the oil system is safely contained for off normal conditions such as accident conditions or earthquakes. All of the following shall apply.</p> <p>(1) The oil collection system for each reactor coolant pump shall be capable of collecting lubricating oil from all potential pressurized and nonpressurized leakage sites in each reactor coolant pump oil system.</p> <p>(2) Leakage shall be collected and drained to a vented closed container that can hold the inventory of the reactor coolant pump lubricating oil system.</p> <p>(3) A flame arrestor is required in the vent if the flash point characteristics of the oil present the hazard of a fire flashback.</p> <p>(4) Leakage points on a reactor coolant pump motor to be protected shall include but not be limited to the lift pump and piping, overflow lines, oil cooler, oil fill and drain lines and plugs, flanged connections on oil lines, and the oil reservoirs, where such features exist on the reactor coolant pumps.</p> <p>(5) The collection basin drain line to the collection tank shall be large enough to accommodate the largest potential oil leak such that oil leakage does not overflow the basin.</p>	ANO-2 - 3.3.12(1) Farley - 3.3.12(1) Oconee - 3.3.12(1) Turkey Point - 3.3.12(1) VC Summer – 3.3.12(1) ANO-1 - 3.3.12(1) Beaver Valley - 3.3.12(1) & 3.3.12(4) Catawba – 3.3.12(1) Ginna - 3.3.12(1) McGuire - 3.3.12(1) St. Lucie - 3.3.12(1) Waterford - 3.3.12(1), 3.3.12(2), and 3.3.12(4)	Yes - 3.3.12(1) Concern is from oil mist and is normal operation and is not leakage it is normal motor oil consumption. (ANO-2)	Yes, Section 3.3
<p>3.4 Industrial Fire Brigade. 3.4.1 On-Site Fire-Fighting Capability. All of the following requirements shall apply.</p> <p>(a) A fully staffed, trained, and equipped fire-fighting force shall be available at all times to control and extinguish all fires on site. This force shall have a minimum complement of five persons on duty and shall conform with the following NFPA standards as applicable:</p> <p>(1) NFPA 600, Standard on Industrial Fire Brigades (interior structural fire fighting)</p> <p>(2) NFPA 1500, Standard on Fire Department Occupational Safety and Health Program</p> <p>(3) NFPA 1582, Standard on Medical Requirements for Fire Fighters and Information for Fire Department Physicians</p> <p>(b) * Industrial fire brigade members shall have no other assigned normal</p>	Palisades – 3.4.1(c)	No, Palisades had an RAI (FPE RAI 05) that stated they comply with this section. SE page 53.	No, Section 3.4

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<p>plant duties that would prevent immediate response to a fire or other emergency as required.</p> <p>(c) During every shift, the brigade leader and at least two brigade members shall have sufficient training and knowledge of nuclear safety systems to understand the effects of fire and fire suppressants on nuclear safety performance</p> <p>Exception: Sufficient training and knowledge shall be permitted to be provided by an operations advisor dedicated to industrial fire brigade support criteria.</p> <p>(d) * The industrial fire brigade shall be notified immediately upon verification of a fire.</p> <p>(e) Each industrial fire brigade member shall pass an annual physical examination to determine that he or she can perform the strenuous activity required during manual fire-fighting operations. The physical examination shall determine the ability of each member to use respiratory protection equipment.</p>			
<p>3.4.2* Pre-Fire Plans. Current and detailed pre-fire plans shall be available to the industrial fire brigade for all areas in which a fire could jeopardize the ability to meet the performance criteria described in Section 1.5.</p>	None	No	No, Section 3.4
<p>3.4.2.1* The plans shall detail the fire area configuration and fire hazards to be encountered in the fire area, along with any nuclear safety components and fire protection systems and features that are present.</p>	None	No	No, Section 3.4
<p>3.4.2.2 Pre-fire plans shall be reviewed and updated as necessary.</p>	None	No	No, Section 3.4
<p>3.4.2.3* Pre-fire plans shall be available in the control room and made available to the plant industrial fire brigade.</p>	None	No	No, Section 3.4
<p>3.4.2.4* Pre-fire plans shall address coordination with other plant groups during fire emergencies.</p>	Palisades	NO, Palisades provided explanation and updated pre-fire plans with Rad Release information.	No, Section 3.4
<p>3.4.3 Training and Drills. Industrial fire brigade members and other plant personnel who would respond to a fire in conjunction with the brigade shall be provided with training commensurate with their emergency responsibilities.</p>	Palisades – 3.4.3(a)(4)	NO, Palisades agreed to update procedures to ensure required written record are maintained -	No, Section 3.4

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<p>(a) Plant Industrial Fire Brigade Training. All of the following requirements shall apply.</p> <p>(1) Plant industrial fire brigade members shall receive training consistent with the requirements contained in NFPA 600, Standard on Industrial Fire Brigades, or NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, as appropriate.</p> <p>(2) Industrial fire brigade members shall be given quarterly training and practice in fire fighting, including radioactivity and health physics considerations, to ensure that each member is thoroughly familiar with the steps to be taken in the event of a fire.</p> <p>(3) A written program shall detail the industrial fire brigade training program.</p> <p>(4) Written records that include but are not limited to initial industrial fire brigade classroom and hands-on training, refresher training, special training schools attended, drill attendance records, and leadership training for industrial fire brigades shall be maintained for each industrial fire brigade member.</p> <p>(b) Training for Non-Industrial Fire Brigade Personnel. Plant personnel who respond with the industrial fire brigade shall be trained as to their responsibilities, potential hazards to be encountered, and interfacing with the industrial fire brigade.</p> <p>(c) * Drills. All of the following requirements shall apply.</p> <p>(1) Drills shall be conducted quarterly for each shift to test the response capability of the industrial fire brigade.</p> <p>(2) Industrial fire brigade drills shall be developed to test and challenge industrial fire brigade response, including brigade performance as a team, proper use of equipment, effective use of pre-fire plans, and coordination with other groups. These drills shall evaluate the industrial fire brigade's abilities to react, respond, and demonstrate proper fire-fighting techniques to control and extinguish the fire and smoke conditions being simulated by the drill scenario.</p> <p>(3) Industrial fire brigade drills shall be conducted in various plant areas, especially in those areas identified to be essential to plant operation and to contain significant fire hazards.</p> <p>(4) Drill records shall be maintained detailing the drill scenario, industrial fire brigade member response, and ability of the industrial fire brigade to perform as a team.</p> <p>(5) A critique shall be held and documented after each drill.</p>		implementation item.	
<p>3.4.4 Fire-Fighting Equipment. Protective clothing, respiratory protective equipment, radiation monitoring</p>	None	No	No, Section 3.4

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equipment, personal dosimeters, and fire suppression equipment such as hoses, nozzles, fire extinguishers, and other needed equipment shall be provided for the industrial fire brigade. This equipment shall conform with the applicable NFPA standards.			
3.4.5 Off-Site Fire Department Interface. 3.4.5.1 Mutual Aid Agreement. Off-site fire authorities shall be offered a plan for their interface during fires and related emergencies on site.	None	No	No, Section 3.4
3.4.5.2* Site-Specific Training. Fire fighters from the off-site fire authorities who are expected to respond to a fire at the plant shall be offered site-specific training and shall be invited to participate in a drill at least annually.	None	No	No, Section 3.4
3.4.5.3* Security and Radiation Protection. Plant security and radiation protection plans shall address off-site fire authority response.	None	No	No, Section 3.4
3.4.6* Communications. An effective emergency communications capability shall be provided for the industrial fire brigade.	None	No	No, Section 3.4
3.5 Water Supply. 3.5.1 A fire protection water supply of adequate reliability, quantity, and duration shall be provided by one of the two following methods. (a) Provide a fire protection water supply of not less than two separate 300,000-gal (1,135,500-L) supplies. (b) Calculate the fire flow rate for 2 hours. This fire flow rate shall be based on 500 gpm (1892.5 L/min) for manual hose streams plus the largest design demand of any sprinkler or fixed water spray system(s) in the power block as determined in accordance with NFPA 13, Standard for the Installation of Sprinkler Systems, or NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection. The fire water supply shall be capable of delivering this design demand with the hydraulically least demanding portion of fire main loop out of service.	Waterford	NO, Waterford RAI FPE 10 addressed concern with fire water system supply demand not meeting the least demanding portion of the main loop out of service.	Yes, Section 3.5 – 3.11
3.5.2* The tanks shall be interconnected such that fire pumps can take suction from	None	No	Yes, Section 3.5 – 3.11

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<p>either or both. A failure in one tank or its piping shall not allow both tanks to drain. The tanks shall be designed in accordance with NFPA 22, Standard for Water Tanks for Private Fire Protection.</p> <p>Exception No. 1: Water storage tanks shall not be required when fire pumps are able to take suction from a large body of water (such as a lake), provided each fire pump has its own suction and both suctions and pumps are adequately separated.</p> <p>Exception No. 2: Cooling tower basins shall be an acceptable water source for fire pumps when the volume is sufficient for both purposes and water quality is consistent with the demands of the fire service.</p>			
<p>3.5.3* Fire pumps, designed and installed in accordance with NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection, shall be provided to ensure that 100 percent of the required flow rate and pressure are available assuming failure of the largest pump or pump power source.</p>	<p>ANO-2 Cooper Oconee Fort Calhoun Oconee Palisades ANO-1 McGuire Point Beach Waterford</p>	<p>Yes Basically NFPA 20 requires elec fire pump to be UL listed. Also, batteries do not identify discharge rate for lead acid batteries. Also, deviation from remote manual stop - provided in CR (ANO & Cooper McG)</p>	<p>Yes, Section 3.5 – 3.11</p>
<p>3.5.4 At least one diesel engine-driven fire pump or two more seismic Category I Class IE electric motor-driven fire pumps connected to redundant Class IE emergency power buses capable of providing 100 percent of the required flow rate and pressure shall be provided.</p>	<p>Oconee</p>	<p>No, ONS does not have dedicated fire pumps, nor do they have diesel engine driven fire pump.</p>	<p>Yes, Section 3.5 – 3.11</p>
<p>3.5.5 Each pump and its driver and controls shall be separated from the remaining fire pumps and from the rest of the plant by rated fire barriers.</p>	<p>Turkey Point</p>	<p>No, Turkey Point LAR states that these fire pumps are not separated by fire barriers and need NRC approval. Spatial separation is basis and lack of ignition sources near pumps.</p>	<p>Yes, Section 3.5 – 3.11</p>
<p>3.5.6</p>	<p>Oconee</p>	<p>Yes, PB for auto start and</p>	<p>Yes, Section 3.5 –</p>

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Fire pumps shall be provided with automatic start and manual stop only.	Palisades Point Beach	manual stop from CR.	3.11
3.5.7 Individual fire pump connections to the yard fire main loop shall be provided and separated with sectionalizing valves between connections.	Oconee	No, ONS has unique system and cannot meet this requirement. Prior NRC approval was granted.	Yes, Section 3.5 – 3.11
3.5.8 A method of automatic pressure maintenance of the fire protection water system shall be provided independent of the fire pumps.	None	No	Yes, Section 3.5 – 3.11
3.5.9 Means shall be provided to immediately notify the control room, or other suitable constantly attended location, of operation of fire pumps.	None	No	Yes, Section 3.5 – 3.11
3.5.10 An underground yard fire main loop, designed and installed in accordance with NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances, shall be installed to furnish anticipated water requirements.	Oconee	No, Keowee does not have an underground loop	Yes, Section 3.5 – 3.11
3.5.11 Means shall be provided to isolate portions of the yard fire main loop for maintenance or repair without simultaneously shutting off the supply to both fixed fire suppression systems and fire hose stations provided for manual backup. Sprinkler systems and manual hose station standpipes shall be connected to the plant fire protection water main so that a single active failure or a crack to the water supply piping to these systems can be isolated so as not to impair both the primary and backup fire suppression systems.	Duane Arnold Beaver Valley	Yes	Yes, Section 3.5 – 3.11
3.5.12 Threads compatible with those used by local fire departments shall be provided on all hydrants, hose couplings, and standpipe risers. Exception: Fire departments shall be permitted to be provided with adapters that allow interconnection between plant equipment and the fire department equipment if adequate training and procedures are provided.	None	No	Yes, Section 3.5 – 3.11
3.5.13 Headers fed from each end shall be permitted inside buildings to supply both sprinkler and standpipe systems, provided steel piping and fittings meeting the requirements of ANSI B31.1, Code for Power Piping, are used for the headers	Point Beach	Point Beach requested Approval with clarification. Seems like they are pointing to several other	Yes, Section 3.5 – 3.11

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<p>(up to and including the first valve) supplying the sprinkler systems where such headers are part of the seismically analyzed hose standpipe system. Where provided, such headers shall be considered an extension of the yard main system. Each sprinkler and standpipe system shall be equipped with an outside screw and yoke (OS&Y) gate valve or other approved shutoff valve.</p>		<p>clarifications throughout the LAR, which justify meeting this rule. Not described as a “performance based” approach.</p>	
<p>3.5.14* All fire protection water supply and fire suppression system control valves shall be under a periodic inspection program and shall be supervised by one of the following methods. (a) Electrical supervision with audible and visual signals in the main control room or other suitable constantly attended location. (b) Locking valves in their normal position. Keys shall be made available only to authorized personnel. (c) Sealing valves in their normal positions. This option shall be utilized only where valves are located within fenced areas or under the direct control of the owner/operator.</p>	<p>Fort Calhoun Beaver Valley</p>	<p>Yes</p>	<p>Yes, Section 3.5 – 3.11</p>
<p>3.5.15 Hydrants shall be installed approximately every 250 ft (76 m) apart on the yard main system. A hose house equipped with hose and combination nozzle and other auxiliary equipment specified in NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances, shall be provided at intervals of not more than 1000 ft (305 m) along the yard main system. Exception: Mobile means of providing hose and associated equipment, such as hose carts or trucks, shall be permitted in lieu of hose houses. Where provided, such mobile equipment shall be equivalent to the equipment supplied by three hose houses.</p>	<p>Farley Oconee VC Summer</p>	<p>Yes</p>	<p>Yes, Section 3.5 – 3.11</p>
<p>3.5.16* The fire protection water supply system shall be dedicated for fire protection use only. Exception No. 1: Fire protection water supply systems shall be permitted to be used to provide backup to nuclear safety systems, provided the fire protection water supply systems are designed and maintained to deliver the combined fire and nuclear safety flow demands for the duration specified by the applicable analysis.</p>	<p>ANO-2 Brunswick Callaway DC Cook Farley Harris Oconee Palisades ANO-1</p>	<p>Yes</p>	<p>Yes, Section 3.5 – 3.11</p>

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Chapter 3 Fundamental Fire Protection Program and Design Elements	Att. L Requests	Performance based approach previously approved by NRC? (yes/no)	Recommendation to allow PB approach?
Exception No. 2: Fire protection water storage can be provided by plant systems serving other functions, provided the storage has a dedicated capacity capable of providing the maximum fire protection demand for the specified duration as determined in this section.	Ginna McGuire Point Beach Prairie Island Robinson Waterford		
<p>3.6 Standpipe and Hose Stations.</p> <p>3.6.1 For all power block buildings, Class III standpipe and hose systems shall be installed in accordance with NFPA 14, Standard for the Installation of Standpipe, Private Hydrant, and Hose Systems.</p>	Cooper Fort Calhoun Oconee Calvert Cliffs Point Beach	Yes	Yes, Section 3.5 – 3.11
<p>3.6.2 A capability shall be provided to ensure an adequate water flow rate and nozzle pressure for all hose stations. This capability includes the provision of hose station pressure reducers where necessary for the safety of plant industrial fire brigade members and off-site fire department personnel.</p>	Oconee Palisades	Yes	Yes, Section 3.5 – 3.11
<p>3.6.3 The proper type of hose nozzle to be supplied to each power block area shall be based on the area fire hazards. The usual combination spray/straight stream nozzle shall not be used in areas where the straight stream can cause unacceptable damage or present an electrical hazard to fire-fighting personnel. Listed electrically safe fixed fog nozzles shall be provided at locations where high-voltage shock hazards exist. All hose nozzles shall have shutoff capability and be able to control water flow from full open to full closed.</p>	None	No	Yes, Section 3.5 – 3.11
<p>3.6.4 Provisions shall be made to supply water at least to standpipes and hose stations for manual fire suppression in all areas containing systems and components needed to perform the nuclear safety functions in the event of a safe shutdown earthquake (SSE). Exception: For existing plants that are not capable of meeting this requirement, provisions to restore a water supply and distribution system for manual fire-fighting purposes shall be made. This provisional manual fire-fighting standpipe/hose station system shall be capable of providing manual fire-fighting protection to the various plant locations important to supporting and maintaining the nuclear safety function. The provisions for establishing this provisional system shall be preplanned and be capable of being implemented in a timely manner</p>	Palisades	No. Note: Exception not endorsed in 10 CFR 50.48c	Yes, Section 3.5 – 3.11

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Chapter 3 Fundamental Fire Protection Program and Design Elements	Att. L Requests	Performance based approach previously approved by NRC? (yes/no)	Recommendation to allow PB approach?
following an SSE.			
3.6.5 Where the seismic required hose stations are cross-connected to essential seismic non-fire protection water supply systems, the fire flow shall not degrade the essential water system requirement.	None	No	Yes, Section 3.5 – 3.11
3.7 Fire Extinguishers. Where provided, fire extinguishers of the appropriate number, size, and type shall be provided in accordance with NFPA 10, Standard for Portable Fire Extinguishers. Extinguishers shall be permitted to be positioned outside of fire areas due to radiological conditions.	Cooper	Yes	Yes, Section 3.5 – 3.11
3.8 Fire Alarm and Detection Systems. 3.8.1 Fire Alarm. Alarm initiating devices shall be installed in accordance with NFPA 72, National Fire Alarm Code®. Alarm annunciation shall allow the proprietary alarm system to transmit fire-related alarms, supervisory signals, and trouble signals to the control room or other constantly attended location from which required notifications and response can be initiated. Personnel assigned to the proprietary alarm station shall be permitted to have other duties. The following fire-related signals shall be transmitted: (1) Actuation of any fire detection device (2) Actuation of any fixed fire suppression system (3) Actuation of any manual fire alarm station (4) Starting of any fire pump (5) Actuation of any fire protection supervisory device (6) Indication of alarm system trouble condition	Turkey Point – 3.8.1(2)	Yes	Yes, Section 3.5 – 3.11
3.8.1.1 Means shall be provided to allow a person observing a fire at any location in the plant to quickly and reliably communicate to the control room or other suitable constantly attended location.	None	No	Yes, Section 3.5 – 3.11
3.8.1.2 Means shall be provided to promptly notify the following of any fire emergency in such a way as to allow them to determine an appropriate course of action: (1) General site population in all occupied areas (2) Members of the industrial fire brigade and other groups supporting fire emergency response (3) Off-site fire emergency response agencies. Two independent means shall	None	No	Yes, Section 3.5 – 3.11

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Chapter 3 Fundamental Fire Protection Program and Design Elements	Att. L Requests	Performance based approach previously approved by NRC? (yes/no)	Recommendation to allow PB approach?
be available (e.g., telephone and radio) for notification of off-site emergency services			
3.8.2 Detection. If automatic fire detection is required to meet the performance or deterministic requirements of Chapter 4, then these devices shall be installed in accordance with NFPA 72, National Fire Alarm Code, and its applicable appendixes.	Palisades	Yes	Yes, Section 3.5 – 3.11
3.9 Automatic and Manual Water-Based Fire Suppression Systems. 3.9.1* If an automatic or manual water-based fire suppression system is required to meet the performance or deterministic requirements of Chapter 4, then the system shall be installed in accordance with the appropriate NFPA standards including the following: (1) NFPA 13, Standard for the Installation of Sprinkler Systems (2) NFPA 15, Standard for Water Spray Fixed Systems for Fire Protection (3) NFPA 750, Standard on Water Mist Fire Protection Systems (4) NFPA 16, Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems	None	No	Yes, Section 3.5 – 3.11
3.9.2 Each system shall be equipped with a water flow alarm.	None	No	Yes, Section 3.5 – 3.11
3.9.3 All alarms from fire suppression systems shall annunciate in the control room or other suitable constantly attended location.	Turkey Point	Yes	Yes, Section 3.5 – 3.11
3.9.4 Diesel-driven fire pumps shall be protected by automatic sprinklers.	Turkey Point Browns Ferry	Yes	Yes, Section 3.5 – 3.11
3.9.5 Each system shall be equipped with an OS&Y gate valve or other approved shutoff valve.	None	No	Yes, Section 3.5 – 3.11
3.9.6 All valves controlling water-based fire suppression systems required to meet the performance or deterministic requirements of Chapter 4 shall be supervised as described in 3.5.14.	None	No	Yes, Section 3.5 – 3.11
3.10 Gaseous Fire Suppression Systems. 3.10.1 If an automatic total flooding and local application gaseous fire suppression	None	No	Yes, Section 3.5 – 3.11

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Chapter 3 Fundamental Fire Protection Program and Design Elements	Att. L Requests	Performance based approach previously approved by NRC? (yes/no)	Recommendation to allow PB approach?
<p>system is required to meet the performance or deterministic requirements of Chapter 4, then the system shall be designed and installed in accordance with the following applicable NFPA codes:</p> <p>(1) NFPA 12, Standard on Carbon Dioxide Extinguishing Systems (2) NFPA 12A, Standard on Halon 1301 Fire Extinguishing Systems (3) NFPA 2001, Standard on Clean Agent Fire Extinguishing Systems</p>			
<p>3.10.2 Operation of gaseous fire suppression systems shall annunciate and alarm in the control room or other constantly attended location identified.</p>	None	Yes (similar to 3.9.3)	Yes, Section 3.5 – 3.11
<p>3.10.3 Ventilation system design shall take into account prevention from over-pressurization during agent injection, adequate sealing to prevent loss of agent, and confinement of radioactive contaminants.</p>	None	No	Yes, Section 3.5 – 3.11
<p>3.10.4* In any area required to be protected by both primary and backup gaseous fire suppression systems, a single active failure or a crack in any pipe in the fire suppression system shall not impair both the primary and backup fire suppression capability.</p>	None	No	Yes, Section 3.5 – 3.11
<p>3.10.5 Provisions for locally disarming automatic gaseous suppression systems shall be secured and under strict administrative control.</p>	Cooper	Yes	Yes, Section 3.5 – 3.11
<p>3.10.6* Total flooding carbon dioxide systems shall not be used in normally occupied areas.</p>	None	No	Yes, Section 3.5 – 3.11
<p>3.10.7 Automatic total flooding carbon dioxide systems shall be equipped with an audible pre-discharge alarm and discharge delay sufficient to permit egress of personnel. The carbon dioxide system shall be provided with an odorizer.</p>	Cooper	Yes	Yes, Section 3.5 – 3.11
<p>3.10.8 Positive mechanical means shall be provided to lock out total flooding carbon dioxide systems during work in the protected space.</p>	None	No	Yes, Section 3.5 – 3.11
<p>3.10.9 The possibility of secondary thermal shock (cooling) damage shall be considered during the design of any gaseous fire suppression system, but particularly with</p>	None	No	Yes, Section 3.5 – 3.11

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carbon dioxide.			
3.10.10 Particular attention shall be given to corrosive characteristics of agent decomposition products on safety systems.	None	No	Yes, Section 3.5 – 3.11
3.11 Passive Fire Protection Features. This section shall be used to determine the design and installation requirements for passive protection features. Passive fire protection features include wall, ceiling, and floor assemblies, fire doors, fire dampers, and through fire barrier penetration seals. Passive fire protection features also include electrical raceway fire barrier systems (ERFBS) that are provided to protect cables and electrical components and equipment from the effects of fire.	None	No	Yes, Section 3.5 – 3.11
3.11.1 Building Separation. Each major building within the power block shall be separated from the others by barriers having a designated fire resistance rating of 3 hours or by open space of at least 50 ft (15.2 m) or space that meets the requirements of NFPA 80A, Recommended Practice for Protection of Buildings from Exterior Fire Exposures. <i>Exception: Where a performance-based analysis determines the adequacy of building separation, the requirements of 3.11.1 shall not apply.</i>	None	Already includes a Performance Based Approach exception	Yes, Section 3.5 – 3.11
3.11.2 Fire Barriers. Fire barriers required by Chapter 4 shall include a specific fire-resistance rating. Fire barriers shall be designed and installed to meet the specific fire resistance rating using assemblies qualified by fire tests. The qualification fire tests shall be in accordance with NFPA 251, Standard Methods of Tests of Fire Endurance of Building Construction and Materials, or ASTM E 119, Standard Test Methods for Fire Tests of Building Construction and Materials.	None	No	Yes, Section 3.5 – 3.11
3.11.3* Fire Barrier Penetrations. Penetrations in fire barriers shall be provided with listed fire-rated door assemblies or listed rated fire dampers having a fire resistance rating consistent with the designated fire resistance rating of the barrier as determined by the performance requirements established by Chapter 4. (See 3.11.3.4 for penetration seals for through penetration fire stops.) Passive fire protection devices such as doors and dampers shall conform with the following NFPA standards, as applicable: (1) NFPA 80, Standard for Fire Doors and Fire Windows (2) NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating	None	Already includes a Performance Based Approach exception	Yes, Section 3.5 – 3.11

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<p>Systems (3) NFPA 101, Life Safety Code</p> <p><i>Exception: Where fire area boundaries are not wall-to-wall, floor-to-ceiling boundaries with all penetrations sealed to the fire rating required of the boundaries, a performance-based analysis shall be required to assess the adequacy of fire barrier forming the fire boundary to determine if the barrier will withstand the fire effects of the hazards in the area. Openings in fire barriers shall be permitted to be protected by other means as acceptable to the AHJ.</i></p>			
<p>3.11.4* Through Penetration Fire Stops. Through penetration fire stops for penetrations such as pipes, conduits, bus ducts, cables, wires, pneumatic tubes and ducts, and similar building service equipment that pass through fire barriers shall be protected as follows.</p> <p>(a) The annular space between the penetrating item and the through opening in the fire barrier shall be filled with a qualified fire-resistive penetration seal assembly capable of maintaining the fire resistance of the fire barrier. The assembly shall be qualified by tests in accordance with a fire test protocol acceptable to the AHJ or be protected by a listed fire-rated device for the specified fire-resistive period.</p> <p>(b) Conduits shall be provided with an internal fire seal that has an equivalent fire-resistive rating to that of the fire barrier through opening fire stop and shall be permitted to be installed on either side of the barrier in a location that is as close to the barrier as possible.</p> <p>Exception: Openings inside conduit 4 in. (10.2 cm) or less in diameter shall be sealed at the fire barrier with a fire-rated internal seal unless the conduit extends greater than 5 ft (1.5 m) on each side of the fire barrier. In this case the conduit opening shall be provided with noncombustible material to prevent the passage of smoke and hot gases. The fill depth of the material packed to a depth of 2 in. (5.1 cm) shall constitute an acceptable smoke and hot gas seal in this application.</p>	Palisades – 3.11(4)(b)	Yes	Yes, Section 3.5 – 3.11
<p>3.11.5* Electrical Raceway Fire Barrier Systems (ERFBS). ERFBS required by Chapter 4 shall be capable of resisting the fire effects of the hazards in the area. ERFBS shall be tested in accordance with and shall meet the acceptance criteria of NRC Generic Letter 86-10, Supplement 1, “Fire Endurance Test Acceptance Criteria for Fire Barrier Systems Used to Separate Safe Shutdown Trains Within the Same Fire Area.” The ERFBS needs to adequately address the design requirements and limitations of supports and</p>	Fort Calhoun	Yes Note: NRC endorsed deletion of PB approach at Fort Calhoun because RAIs showed that they met exception 2.	Yes, Section 3.5 – 3.11

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<p>intervening items and their impact on the fire barrier system rating. The fire barrier system's ability to maintain the required nuclear safety circuits free of fire damage for a specific thermal exposure, barrier design, raceway size and type, cable size, fill, and type shall be demonstrated.</p> <p>Exception No. 1: When the temperatures inside the fire barrier system exceed the maximum temperature allowed by the acceptance criteria of Generic Letter 86-10, "Fire Endurance Acceptance Test Criteria for Fire Barrier Systems Used to Separate Redundant Safe Shutdown Training Within the Same Fire Area," Supplement 1, functionality of the cable at these elevated temperatures shall be demonstrated. Qualification demonstration of these cables shall be performed in accordance with the electrical testing requirements of Generic Letter 86-10, Supplement 1, Attachment 1, "Attachment Methods for Demonstrating Functionality of Cables Protected by Raceway Fire Barrier Systems During and After Fire Endurance Test Exposure."</p> <p>Exception No. 2: ERFBS systems employed prior to the issuance of Generic Letter 86-10, Supplement 1, are acceptable providing that the system successfully met the limiting end point temperature requirements as specified by the AHJ at the time of acceptance.</p>			