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ND-18-0593  
10 CFR 50.90  
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U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Southern Nuclear Operating Company  
Vogtle Electric Generating Plant Units 3 and 4  
Request for License Amendment and Exemption:  
Fire Protection System Non-Safety Cable Spray Removal (LAR-18-015)

Ladies and Gentlemen:

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC) requests an amendment to the combined licenses (COLs) for Vogtle Electric Generating Plant (VEGP) Units 3 and 4 (License Numbers NPF-91 and NPF-92, respectively). The requested amendment proposes to depart from Tier 2 information in the Updated Final Safety Analysis Report (UFSAR) (which includes the plant-specific Design Control Document (DCD) Tier 2 information) and involves related changes to plant-specific Tier 1 information, with corresponding changes to the associated COL Appendix C information. Pursuant to the provisions of 10 CFR 52.63(b)(1), an exemption from elements of the design as certified in the 10 CFR Part 52, Appendix D, design certification rule is also requested for the plant-specific DCD Tier 1 material departures.

The license amendment request (LAR) proposes to depart from Tier 2 information in UFSAR Subsections 9.5.1 and 19.59 and Appendix 9A by removing the fire protection system (FPS) non-safety related containment cable spray and installing passive fire stops and radiant energy shields. The requested amendment also involves related changes to plant-specific Tier 1 Figures 2.3.4-1 and 2.3.4-2, with corresponding changes to the associated COL Appendix C information.

Enclosure 1 provides the description, technical evaluation, regulatory evaluation (including the Significant Hazards Consideration Determination) and environmental considerations for the proposed changes.

Enclosure 2 provides the background and supporting basis for the requested exemption.

Enclosure 3 identifies the requested changes and provides markups depicting the requested changes to the VEGP Units 3 and 4 licensing basis documents.

This letter contains no regulatory commitments. This letter has been reviewed and determined not to contain security related information.

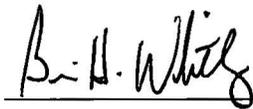
SNC presented overviews of this amendment request during public meetings with the NRC on September 14, 2017 and April 19, 2018. SNC requests NRC staff approval of the license amendment by October 15, 2018, to support installation of FPS piping inside containment. SNC expects to implement this proposed amendment within 30 days of approval of the requested changes.

In accordance with 10 CFR 50.91, SNC is notifying the State of Georgia of this LAR by transmitting a copy of this letter and its enclosures to the designated State Official.

Should you have any questions, please contact Mr. Adam Quarles at (205) 992-7031.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 27th of April 2018.

Respectfully submitted,



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Brian H. Whitley  
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Southern Nuclear Operating Company

- Enclosures
- 1) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Request for License Amendment Regarding Fire Protection System Non-Safety Cable Spray Removal (LAR-18-015)
  - 2) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Exemption Request: Fire Protection System Non-Safety Cable Spray Removal (LAR-18-015)
  - 3) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Proposed Changes to Licensing Basis Documents (LAR-18-015)

U.S. Nuclear Regulatory Commission

ND-18-0593

Page 3 of 4

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**Southern Nuclear Operating Company**

**ND-18-0593**

**Enclosure 1**

**Vogtle Electric Generating Plant (VEGP) Units 3 and 4**

**Request for License Amendment Regarding  
Fire Protection System Non-Safety Cable Spray Removal  
(LAR-18-015)**

(This Enclosure consists of 24 pages, including this cover page.)

ND-18-0593

Enclosure 1

Request for License Amendment Regarding Fire Protection System Non-Safety Cable Spray Removal (LAR-18-015)

### **Table of Contents**

1. SUMMARY DESCRIPTION
2. DETAILED DESCRIPTION
3. TECHNICAL EVALUATION
4. REGULATORY EVALUATION
  - 4.1. Applicable Regulatory Requirements/Criteria
  - 4.2. Precedent
  - 4.3. Significant Hazards Consideration
  - 4.4. Conclusions
5. ENVIRONMENTAL CONSIDERATIONS
6. REFERENCES

Pursuant to 10 CFR 52.98(c) and in accordance with 10 CFR 50.90, Southern Nuclear Operating Company (SNC) hereby requests an amendment to Combined License (COL) Nos. NPF-91 and NPF-92 for Vogtle Electric Generating Plant (VEGP) Units 3 and 4, respectively.

## 1. SUMMARY DESCRIPTION

The proposed change would revise the COLs by removing the cable tray spray system from Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Figures 2.3.4-1 and 2.3.4-2 of COL Appendix C.

The requested amendment proposes changes to plant-specific Design Control Document (DCD) Tier 2 information in the Updated Final Safety Analysis Report (UFSAR) that involve changes to COL Appendix C, and corresponding changes to plant-specific Tier 1 information. This enclosure requests approval of the license amendment necessary to implement the COL Appendix C and UFSAR changes. Enclosure 2 requests the exemption necessary to implement the involved changes to the plant-specific Tier 1 information.

## 2. DETAILED DESCRIPTION

COL Appendix C Subsection 2.3.4 contains ITAAC for the fire protection system (FPS). COL Appendix C Figure 2.3.4-1 (sheet 2) shows the FPS and Figure 2.3.4-2 shows the FPS piping which must remain functional following a safe shutdown earthquake (SSE). These two figures depict FPS piping to cable tray sprays in fire zone 1100 AF 11300B.

### Design Function Related to Activity

The FPS is a nonsafety-related, non-seismic system consisting of fire detection and alarm, fire water supply, and automatic and manual fire suppression to prevent fires and minimize consequences should a fire occur.

The design of the FPS meets the applicable requirements of NFPA 804, "Standard for Fire Protection for Advanced Light Water Reactor Electric Generating Plants," and NUREG-0800 Standard Review Plan (SRP), Section 9.5.1, "Fire Protection Program," Revision 3, July 1981 including Branch Technical Position (BTP) CMEB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants," Revision 2, July 1981. The fire protection program utilizes the guidance of various industry and regulatory documents including that provided in Revision 1 of Regulatory Guide 1.189, "Fire Protection for Nuclear Power Plants" (RG 1.189). RG 1.189 recognizes the use of passive fire stops in lieu of water spray systems.

In accordance with BTP CMEB 9.5-1, special seismic design requirements are applied to portions of the manual fire suppression standpipes system located in areas containing equipment required for safe shutdown following a safe shutdown earthquake (SSE). With the exception of the seismic standpipe system requirement to provide water to the fire hose valves in the service areas containing equipment required for safe shutdown following an SSE, the remaining portions of the FPS are not required to remain functional following an SSE.

The FPS also performs a single safety-related function of containment isolation during design basis accidents for the fire protection water supply line that penetrates containment.

The containment isolation valve and the portion of piping that maintain the integrity of the containment pressure boundary are seismic Category I, ASME Class 2.

As discussed in UFSAR Subsection 9.5.1, the AP1000 containment consists of a single fire area that is divided into several fire zones. The containment fire zone boundaries credit 1) structural barriers and distance that physically separate one fire zone from another and/or 2) distances that inhibit fire propagation from one zone to another.

Complete fire barrier separation cannot be provided in containment because of the need to maintain the circulation of containment atmosphere gases for purposes such as passive containment cooling. Therefore, the fire hazards analyses in containment is predicated on fire zone separation with the establishment of boundaries (structure and distance) that inhibit fire propagation from zone to zone. The location of safety-related equipment and the routing of Class 1E electrical cable in each fire zone are designed to enhance the separation of redundant safe shutdown components such that a fire which damages safe shutdown components in one fire zone does not propagate to the extent that it damages redundant safe shutdown components in another fire zone.

An open-nozzle water spray suppression system is provided for nonsafety-related electrical cables routed in open cable trays in fire zone 1100 AF 11300B (fire zone 11300B) which is part of room number 11300 whose floor is at elevation 107'-2". Safety-related cables (in room number 11300 and elsewhere) are routed in closed cable trays or conduit. Physical distance and structural barriers are credited for protection of the safety-related cables. Absent the ability to implement complete fire barrier separation of the nonsafety-related electrical cable trays, the purpose of the open nozzle water spray suppression system is to provide additional assurance that a fire will not propagate via the nonsafety-related electrical cable trays in fire zone 11300B to another fire zone. Actuation of the suppression system requires a manual operator action to open the outboard containment isolation valve. The outboard containment isolation valve is manually actuated to prevent spurious actuation.

The FPS open-nozzle suppression system that feeds into containment is used to spray nonsafety-related open cable trays. The FPS open-nozzle suppression system is designed to mitigate extensive burning of nonsafety-related cables that could propagate to another fire zone and adversely affect safe shutdown components in another fire zone during a fire event.

There is no credit taken for the FPS open-nozzle suppression system to operate following a seismic event, as there are no requirements to consider a fire event concurrent with any other plant accident including a seismic event.

#### Reason for Activity

Safety-related cables are routed in closed cable trays or conduit. For open cable trays, which represent the only significant in-situ combustibles in fire zone 11300B during power operations, an open-nozzle water spray suppression system is provided. The purpose of the water spray suppression system is to prevent a fire in the nonsafety-related electrical cables in open cable trays from propagating to another fire zone from fire zone 11300B.

The open-nozzle water spray suppression system control valves are initiated automatically upon receipt of a fire detection signal based on heat detectors located in the nonsafety-related cable tray. The initiation of water suppression spray relies on the operation of multiple active components such as the fire detection system. Upon initiation of a fire signal (heat detection) the fire detection system control panel sends a signal to activate the opening of FPS open-nozzle water spray motor control valves.

However, the open-nozzle water spray suppression system is not fully automatic and to preclude inadvertent actuation and unnecessary water deluge of the maintenance floor and adjacent areas in containment, manual operator action is required to open the outboard FPS containment isolation valve. There are no normally closed isolation/control valves downstream of the outboard FPS containment isolation valve. Water that enters the open-nozzle water spray suppression system after initiation of the heat detection and activation of the motor control valve will be discharged through the nozzles into the open nonsafety-related cable trays of fire zone 11300B.

The open-nozzle water spray suppression system requires more than 400 open nozzles and a substantial amount of piping and associated piping supports in order to accomplish its fire suppression function. These piping and supports involve complex design, construction, and maintenance issues and add to the congestion in the area of room number 11300.

Therefore, to reduce the need for manual valve manipulation outside the control room and to reduce the piping/support congestion and constructability issues in containment caused by the open-nozzle water spray suppression system, it is proposed to replace the open-nozzle water spray suppression system for open nonsafety-related cable trays in fire zone 11300B with passive fire stops. The passive fire stops will be placed in the open nonsafety-related cable trays at the point where the cable trays transition out of fire zone 11300B. The purpose of the passive fire stops is to prevent a fire in the open nonsafety-related electrical cable trays in fire zone 11300B from propagating to an adjacent fire zone.

#### Description of Activity

The passive fire stops that are proposed to replace the open-nozzle water spray suppression system in fire zone 11300B consist of an engineered and tested configuration that will be mounted in the nonsafety-related open cable trays. These passive fire stops will be placed in the nonsafety-related open cable trays near the boundary of fire zone 11300B prior to where the trays continue into adjacent fire zones. The purpose of the passive fire stops is to prevent a fire in the nonsafety-related open cable trays of fire zone 11300B from propagating to another fire zone.

As noted in UFSAR Subsection 9A.3.1.1, "Containment/Shield Building," fire zone 11300B (in Subsection 9A.3.1.1.8) is the maintenance floor (north half). As shown in UFSAR Figure 9A-1, Sheet 5 of 16, "Nuclear Island Fire Areas Plan at Elevation 100'-0" & 107'-2", room number 11300 is the maintenance floor at elevation 107'-2". Room 11300 is located to the plant north of the reactor cavity, continues east and south around the outside of the steam generator 2 enclosure and then west to the east wall of the refueling cavity. Room 11300 is divided into two fire zones: Fire Zone 1100 AF 11300A is the plant southeast area of Room 11300 and Fire Zone 1100 AF 11300B is the plant north area of room 11300. Except for the

circuitous arrangement of room number 11300 among the containment internal structures (reactor cavity and steam generator enclosures), there are no physical barriers between fire zones 1100 AF 11300A and 1100 AF 11300B at elevation 107'-2".

As discussed in UFSAR Subsection 9A.3.1.1.8, "Fire Zone 1100 AF 11300B," the combustible materials in this fire zone consist primarily of cable insulation in the termination boxes and open cable trays. As shown in Table 9A-3, "Fire Protection Summary," combustible loadings are conservatively increased in fire zone 11300B with the addition of unspecified trash and volatiles (only expected during refueling outage maintenance activities) such that along with the known cable insulation combustibles, the equivalent fire duration is calculated to be less than three hours.

As discussed in UFSAR Subsection 9A.3.1.1.8, "The quantity and arrangement of combustible materials in this fire zone, and the characteristics of the barriers that separate this zone from other fire zones are such that a fire which damages safe shutdown components in this fire zone does not propagate to the extent that it damages redundant safe shutdown components in another fire zone."

As stated in the UFSAR Subsection 9A.3.1.1.8, "...open-nozzle water spray suppression systems are provided for nonsafety-related electrical cables routed in open cable trays in fire zone 1100 AF 11300B, providing additional assurance that a fire will not propagate between these fire zones."

Fire barrier separation is not required within the containment fire area (including the middle and upper annulus zones of the shield building). Fire protection within the containment fire area is accomplished by minimizing the quantity of combustible materials, and by the use of spatial separation combined with appropriate fire detection and manual fire protection capabilities. Fire protection features are sufficient to ensure that one train of safe shutdown equipment will remain undamaged in the event of a fire inside containment.

From the standpoint of fire zone separation, fire zone 11300B is physically separated from fire zones at lower elevations by the maintenance floor, which has a concrete thickness of more than one foot, except for access stairways and hatches. Fire zone 11300B is separated from the operating deck above by a ceiling that has a concrete thickness of more than one foot, except for several openings (access stairway, elevator, etc.). The perimeter of fire zone 11300B consists of the steel containment vessel, the steel wall of the in-containment refueling water storage tank, the noncombustible enclosure for the division B and D penetrations and raceways (room number 11306, fire zone 1100 AF 11500), and the reactor cavity and steam generator enclosure walls (having a concrete thickness of more than one foot).

#### Issues with existing open-nozzle water spray suppression system

As shown in Combined License (COL) Appendix C Figure 2.3.4-2, "Boundaries of Fire Protection System Piping That Must Remain Functional Following a Safe Shutdown Earthquake," the current FPS open nozzle cable tray suppression system is configured in a five-branch manifold. The five branches consist of one larger system of approximately 145

nozzles and 4 smaller systems of approximately 70 nozzles each for a total of approximately 425 nozzles.

The current FPS open nozzle cable tray suppression system is mechanically complex with approximately 425 open nozzles and associated piping and supports. The suppression system relies on multiple active components (detection system functioning and control valves opening) and manual operator action (acknowledging a fire alarm and opening manual containment isolation valve) before fire suppression takes place in the nonsafety-related open cable trays. Failure of any of these steps would result in the system not functioning as designed.

The current open nozzle cable tray suppression system also requires an annual partial trip test to meet NFPA 25, "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems," which, if performed incorrectly, could result in inadvertent water spray and damage to equipment inside containment. Also, NFPA 25 requires a full flow test of the system every three years which is not feasible for the open nozzle system inside containment because of the water spray through the nozzles and subsequent damage to equipment inside containment.

The complexity of the open nozzle cable tray suppression system is in contrast to the relatively limited quantity of combustibles in fire zone 11300B. Because of administrative control of combustible material in containment, the only intervening combustibles during plant operation are the cable insulation in the terminal boxes and open cable trays and even this material is required to be fire retardant. As indicated in UFSAR Table 9A-3, "Fire Protection Summary," fire zone 11300B has a fire duration (including trash and volatiles that will be administratively controlled) of less than three hours.

The replacement of the current open nozzle cable tray suppression system with passive fire stops will reduce FPS system complexity thereby improving FPS constructability and maintainability; reduce congestion in the maintenance floor area resulting in increased efficiencies and improved personnel safety during outage activities in that area; and eliminate the chance of inadvertent actuation of the system while still preventing fire propagation out of fire zone 11300B to adjacent fire zones.

#### Proposed Licensing Basis Changes

The proposed changes to COL Appendix C (and corresponding plant-specific Tier 1) and the UFSAR related to the replacement of the open-nozzle water spray suppression system in fire zone 11300B with passive fire stops are listed below:

1. COL Appendix C (and corresponding plant-specific Tier 1), Figure 2.3.4-1, sheet 2 – Remove depiction of containment water spray piping to fire zone 1100 AF 11300B
2. COL Appendix C (and corresponding plant-specific Tier 1), Figure 2.3.4-2 - Remove depiction of containment water spray piping to valves V133A/B/C/D/E
3. UFSAR Table 9.5.1-3 – Remove exception to NFPA 15 Section 5.7.2.1 that requires all actuation valves be listed as the non-listed valves are no longer being used.

4. UFSAR Figure 9.5.1-1, sheet 3 – Remove depiction of branch line for Cable Tray Spray.
5. UFSAR Subsection 9A.3.1.1 – Delete fourth bullet (Water spray systems in specific locations) under "Fire Detection and Suppression Features."
6. UFSAR Subsection 9A.3.1.1.7 – Modify last sentence of second paragraph to account for removal of water spray suppression system for nonsafety-related electrical cables in open cable trays in fire zone 1100 AF 11300B and replacement with passive fire stops.
7. UFSAR Subsection 9A.3.1.1.8 – Modify third, fourth, and sixth paragraphs to account for removal of water spray suppression system for nonsafety-related electrical cables in open cable trays in fire zone 1100 AF 11300B and replacement with passive fire stops.
8. UFSAR Table 9A-3, sheet 1 – Remove water spray as a method of fixed suppression capability for fire zone 1100 AF 11300B.
9. UFSAR Table 19.59-18 – Revise the text of item 80 to remove the words "automatic" and "maintenance floor" when referring to the fire system in the containment.

Changes 1 and 2 are changes to COL Appendix C and Plant-Specific Tier 1 information. These changes and change 4 to the UFSAR are changes to figures that depict FPS piping systems. The depiction of the open-nozzle water spray suppression system is removed from these figures because the open-nozzle water spray suppression system is deleted by the change activity. No other changes to the figures are required.

Change 3 is made to UFSAR Table 9.5.1-3, "Exceptions to NFPA Standard Requirements," because an exception was taken to the requirement of NFPA 15 that requires the open-nozzle water spray suppression system actuation valves be listed by a recognized organization. The exception is no longer taken because the system for which it was taken is deleted by the change activity. No new exceptions to NFPA standard requirements are caused by the change activity.

Change 5 is made to UFSAR Subsection 9A.3.1.1, "Containment/Shield Building," by the removal of the fourth bullet under the heading "Fire Detection and Suppression Features" which refers to water spray suppression systems. The removal of the fourth bullet is appropriate because it refers to the open-nozzle water spray suppression system in fire zone 11300B which is deleted by the change activity.

Changes 6 and 7 are made to UFSAR Subsections 9A.3.1.1.7, "Fire Zone 1100 AF 11300A," and 9A.3.1.1.8, "Fire Zone 1100 AF 11300B" to appropriately revise the text to remove reference to and description of the open-nozzle water spray suppression system and replace it with information on the passive fire stops that are the subject of the change activity.

Change 8 is made to UFSAR Table 9A-3, "Fire Protection Summary," to appropriately remove "water spray" from the Fixed Suppression Capability column for fire area 11300B because the open nozzle water spray suppression system is deleted by the change activity.

Change 9 is made to UFSAR Table 19.59-18, "AP1000 PRA-Based Insights," item 80 to remove "automatic" and "maintenance floor" from the text. The purpose of item 80 is to state 1) that operator actions can be accomplished in enough time (30 minutes following detection of a fire) to minimize the probability of spurious Automatic Depressurization System (ADS) actuation, and 2) that operator actions to open the manual FPS containment isolation valve permit fire water to flow into the FPS piping.

The removal of "automatic" and "maintenance floor" from the text of item 80 in Table 19.59-18 is appropriate because the only FPS system in containment to which those words apply is the nonsafety cable tray open-nozzle water spray system. There are other containment FPS systems to which the operator actions still apply, but the fire suppression systems are neither automatic nor located on the maintenance floor.

As discussed in "Final Safety Evaluation Report Related to Certification of the AP1000 Standard Design:" (NUREG-1793, Supplement 2, Volume 2), Chapter 9 through Chapter 24 (ML11293A073), an analysis showing that operator manual action can be accomplished within 30 minutes to minimize the potential for spurious ADS actuation in the event of a fire is presented in APP-GW-GLR-027, "Operator Actions Minimizing Spurious ADS Actuation," (GLR-027). It is noted in GLR-027 that the analysis required to demonstrate operator actions to minimize the probability of spurious ADS actuation caused by fire is not related to the issue involving the procedure for manual actuation of the valve required for fire water to reach the automatic fire system in the containment maintenance floor. GLR-027 goes on to present the ADS analysis. For the operator actions to allow water to reach the automatic fire system in the containment maintenance floor, reference is made to the "Fire Response Emergency" procedure.

The purpose of the Fire Response Emergency procedure is to provide instructions to operators for responding to fires throughout the plant. The procedure includes fire area drawings and cross references of the drawings and room numbers to the various operator instructions. Operator instructions for responding to fires in all containment rooms/fire zones are included in the procedure, not just fire zone 11300B. Therefore, it is appropriate to revise UFSAR Table 19.59-18, item 80 to remove "automatic" and "maintenance floor" from the text.

### **3. TECHNICAL EVALUATION**

The replacement of the non-safety cable tray open-nozzle water spray suppression system in fire zone 1100 AF 11300B with passive fire stops in the non-safety open cable trays is justified for the following reasons which are expanded upon further below:

- The acceptability of the use of passive fire stops in lieu of a manually activated suppression system is recognized by regulatory guidance.
- Passive fire stops are designed and tested to show that fires do not propagate outside the fire zone.

- Passive fire stop material-of-construction complies with IRWST and containment recirculation screens design criteria in UFSAR Subsection 6.3.2.2.7.1.
- Fire zone 1100 AF 11300B combustible loadings are such that the postulated fire duration is less than the test time for which the fire stop was successful in preventing spread of the fire.
- Administrative procedures (i.e., Control of Combustibles and Control of Hot Work) are established for fire protection during times when containment may be open and additional combustible material may be present in fire zone 11300B.

#### Acceptability of the Use of Passive Fire-Resistive Features

Guidance for meeting the U.S. NRC fire protection regulations is provided in part by Regulatory Guide 1.189 and BTP CMEB 9.5-1. Revision 1 of Regulatory Guide 1.189 incorporates the guidance of BTP CMEB 9.5-1.

The guidance in Regulatory Guide 1.189 notes that in some cases fire barriers may not be possible for in-containment fire protection. In the case of fire zone 11300B, piping/support/equipment congestion and the need to maintain open communication between containment compartments means that full fire barriers at the fire zone boundary where nonsafety-related open cable trays run to adjacent fire zones are not feasible.

There are no specific regulations or guidance that recognizes open-nozzle water spray suppression systems as the only means for fire protection for open cable trays. Passive fire stops are being proposed for the nonsafety-related open cable trays as an acceptable alternative provided it is demonstrated that fire propagation is delayed an appropriate amount of time.

The guidance of Regulatory Guide 1.189 (including the BTP CMEB 9.5-1 guidance) is that the passive fire stops meet the following requirements when a full fire barrier is not possible inside containment:

“Fire Stop - a feature of construction that prevents fire propagation along the length of cables or prevents spreading of fire to nearby combustibles within a given fire area or fire zone.”

The National Fire Protection Association (NFPA) standards NFPA 804, "Standard for Fire Protection for Advanced Light Water Reactor Electric Generating Plants," and NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," both include the use of three hour rated fire stops with no requirement for suppression systems. It is noted that the NRC has not endorsed these standards for the AP1000 design and this information is being included only to show industry consensus in the use of passive stops in lieu of active protection systems.

Passive fire stops in nonsafety-related open cable trays are more reliable than active systems such as the current open nozzle cable tray suppression system because they require no mechanical or human action to perform their protective function. When protection

is required, there is no delay for operator or mechanical response. The passive fire stops require less maintenance than active suppression systems making them preferable for the installations in which they are appropriate, such as the fire zone 11300B nonsafety-related open cable trays. The use of passive fire stops reduces congestion in the area of room number 11300 and removes the need for complex design, construction, and maintenance solutions because of the elimination of over 400 nozzles and associated piping and supports.

The existing open nozzle cable tray suppression system is not credited in the Probabilistic Risk Assessment (PRA). Because the open nozzle cable tray suppression system is not fully automatic nor is it a classic manual system, it was excluded from the PRA model. Therefore, removal of the open nozzle cable tray suppression system will have no impact on the PRA calculations and results.

### Fire Stop Design

The passive fire stops that are proposed to replace the open nozzle water suppression system for the nonsafety-related open cable trays consists of a high density silicone elastomer (HDSE) material placed in the open nonsafety-related cable trays at each point where the trays cross from fire zone 11300B into adjacent fire zones. In addition to the HDSE material, the passive fire stops have a 12 gauge stainless steel heat shield installed across the cable trays at the mid-point of the fire stop to aid in prevention of flame propagation. The affected nonsafety-related open cable trays are either horizontally or vertically oriented and contain a range of cable sizes from instrument cables (1/4" to 1/2" diameter) to Reactor Coolant Pump (RCP) power cables (greater than 1" diameter). The HDSE material is formed into fire stops that are about four inches deep and about nine to 12 inches long for the full width of the affected nonsafety-related open cable trays. The HDSE material completely surrounds the nonsafety-related cables at the point of placement of the fire stops.

The HDSE material of construction of the passive fire stops is manufactured by PCI Promatec and is used as fire sealant at many domestic and international nuclear power plants. The HDSE material of construction of the passive fire stops is approved for use elsewhere in the AP1000 design for sealing piping and electrical penetrations inside containment and including below the containment flood-up level (elevation 110'-0"). The HDSE material is primarily silicone, non-abrasive, and will not cause damage to the cables passing through it due to normal power loads or wear away the cable jacketing because of vibration as a result of normal plant operations. In addition, the HDSE material acts as a heat sink, thereby negating the need for cable ampacity derating and potential damage in the form of hardening and cracking of the cable's insulation due to heat build-up.

The HDSE material is mixed and introduced into the formed fire stop location as a low viscosity liquid. As such, it flows into and seals the complex geometries surrounding the cables. Once cured, the form material is removed and the passive fire stop is complete. In its cured state the HDSE material is stable under high heat and radiation conditions and can be decontaminated if needed. Because the fire stop may be in a flooded environment in containment following a design basis accident, the HDSE fire stop material of construction is chosen to be chemically stable in these conditions.

The HDSE material of the passive fire stops is made of non-fibrous high-density silicone material (147 lbs/ft<sup>3</sup>) that exceeds the minimum density requirement of 100 lbs/ft<sup>3</sup> for coatings and sealants inside containment. The use of HDSE material for the construction of the fire stops precludes the transport of the fire stop material to the sump in the event of a high energy line break or other flooding event inside containment. Any combustible, fibrous, or other unqualified form material used as damming material is removed from the fire stop after the foam has cured and therefore will not be transported to the containment sumps during the recirculation phase of a design basis accident. The HDSE material of construction of the passive fire stops will not, if submerged, adversely impact the volume or chemical make-up of debris and/or precipitates in the containment sumps following a design basis accident and sump recirculation will not be adversely affected. In addition, as discussed below, the nonsafety-related open cable trays in fire zone 11300B that will contain the passive fire stops are not in the zone-of-influence (ZOI) of postulated high energy line breaks. Therefore, because the passive fire stops are not in a ZOI and also because they are chemically stable in a flooded condition, the passive fire stops will not become sources of debris that might be generated following a design-basis accident.

#### Fire Stop Testing

A flame-propagation test (fire test) of the proposed passive fire stop design was performed to demonstrate that the passive fire stop will prevent flame propagation along the nonsafety-related open cable trays beyond the passive fire stop for a 3-hour fire exposure. The results of the test show that the passive fire stop design withstood the fire test for the 3-hour period without permitting the propagation of flame through openings, or the flaming of any test element beyond the unexposed side of the passive fire stop.

The flame propagation test was performed using the guidelines of the Institute of Electrical and Electronics Engineers (IEEE) Standard 1202, "IEEE Standard for Flame-Propagation Testing of Wire and Cable," (IEEE Std. 1202). IEEE 1202 was used as a guideline for the fire stop test because the purpose of the standard is to define the fire tests for cables, not passive fire stops. The flame propagation test was performed in a facility that meets the requirements of section 4, "Flame test facility," of IEEE Std. 1202. The following items that differed from the IEEE Std. 1202 section 4 requirements were part of the fire test program:

- The passive fire stop test specimen was mounted in the vertically-oriented cable tray test section; no fire stop is shown in IEEE Std. 1202. The test specimen material of construction and placement in the cable tray were identical to the expected field installation. The use of vertically-oriented cable trays in the test is appropriate because it is assumed that a fire would not propagate faster along a horizontally-oriented cable tray.
- The heat source for the fire test was a propane gas ribbon-style burner with a calculated heat output of 140,000 Btu/hr, which substantially exceeds the IEEE Std. 1202 requirement of 70,000 BTU/hr.
- The width of the burner was not limited to the 10 inches specified in IEEE Std. 1202. Actual width was 20 inches.

- The cables mounted in the cable tray were pre-conditioned to a temperature consistent with that expected in containment during plant operation, about 90°C. The IEEE Std. 1202 requires conditioning to a maximum temperature of 86°F. Pre-heating to 90°C is conservative because less of the 3-hour test time is spent raising the temperature from ambient.
- The cable trays used in the test were of the identical type to be used in the plant installation. RCP power cables were also used in the test. For the smaller diameter cable test, PVC jacketed cables were used. PVC material is not used in containment, but its use in this test is conservative because of its flammability.
- Although not specified in IEEE Std. 1202, the width of the cable tray used in the fire test was 36 inches, which is the maximum width of the nonsafety-related open cable trays subject to the installation of the proposed passive fire stops. The use of the widest cable tray maximizes the potential combustion loading from the cables affected by the propane burner.
- Two fire tests were performed. Both tests included the propane burner aimed at a vertically oriented cable tray with the passive fire stop installed. However, the second test included another vertically-oriented cable tray, with no fire stop installed, adjacent to the flame-impinged cable tray. The second test successfully confirmed that open cable trays adjacent to open cable trays with the passive fire stops installed will not catch fire.

The successful conclusion of the fire test of the passive fire stop proposed for use in the nonsafety-related open cable trays in fire zone 11300B confirms the acceptability of the passive fire stop as an FPS defense-in-depth feature (in addition to train separation and distance) to prevent propagation of a fire to another fire zone.

#### Specifics of Fire Zone 1100 AF 11300B

As discussed in UFSAR Subsection 9A.3.1.1.8, fire zone 11300B is physically separated from fire zones at lower elevations by the maintenance floor, which has a concrete thickness of more than one foot, except for access stairways and hatches. Fire zone 11300B is separated from the operating deck above (fire zone 1100 AF 11500) by a ceiling that has a concrete thickness of more than one foot, except for several openings for an access stairway, elevator, hatches and block outs. The walls of fire zone 11300B are the steel containment vessel, the steel wall of the in-containment refueling water storage tank, the noncombustible enclosure for the division B and D penetrations and raceways (fire zone 1100 AF 11500), or walls with a concrete thickness of more than one foot, except for the designated boundaries with the adjacent portion of the maintenance floor, which is fire zone 1100 AF 11300A. A doorway separates fire zone 11300B from the lower pressurizer compartment (fire zone 1100 AF 11303) and the steam generator 1 lower manway platform (fire zone 1100 AF 11301).

The safe shutdown components in Fire zone 11300B are listed in Table 1 below, which is taken from UFSAR Table 9A-2, "Safe Shutdown Components."

Table 1 – Safe Shutdown Components in Fire Zone 1100 AF 11300B

System	Description	Class 1E Division, Tag Number			
		A	C	B	D
CCS	Outlet Line Cont. Isolation Valve	V207			
CVS	Letdown Containment Isolation Valve	V045			
	Makeup Line Cont. Isolation Valve	V091			
	RCS Purification Stop Valve (RCPB)	V001	V002		
	Zinc Injection Cont. Isolation Valve	V094			
IDS	Class 1E Electrical Penetrations	EY-P11Z	EY-P27Z		
	Class 1E Electrical Penetrations	EY-P12Y	EY-P29Y		
	Class 1E Electrical Penetrations	EY-P13Y	EY-P28Y		
	Cable trays that route Class 1E cables	Note 1	Note 1		
PXS	PRHR Heat Exchanger Control Valve	V108A		V108B	
	IRWST Wide Range Level		LT-047		
	Core Makeup Tank (tag no. MT-02B)				
RCS	Pressurizer Pressure	PT-191A	PT-191C		
	Reference Leg Temperature	TE-193A	TE-193C		
	Pressurizer Level	LT-195A	LT-195C		
	PRHR Heat Exchanger Outlet Temperature		TE-161		
	Hot Leg 1 Wide Range Pressure	PT-140A	PT-140C		
SGS	Steam Generator 1 Narrow Range Water Level	LT-001	LT-003		
	Steam Generator 2 Narrow Range Water Level	LT-005	LT-007		
	Steam Generator 2 Wide Range Water Level	LT-013	LT-017		
	Steam Generator 1 Wide Range Water Level	LT-011	LT-015		
	SG1 Steam Line Pressure	PT-030	PT-032		
	SG2 Steam Line Pressure	PT-034	PT-036		

WLS	Sump Discharge Cont. Isolation Valve	V055			
	RCDT Gas Outlet Con. Isolation Valve	V067			

**Note:**

1. This represents equipment such as cables that have no associated tag number.

The division A and C electrical penetrations and equipment listed in Table 1 are conservatively assumed to be disabled as a result of a fire in this fire zone. The B and D electrical penetrations and equipment and their cable trays routed from the electrical penetrations up to the operating deck are functionally part of fire zone 1100 AF 11500. As discussed in UFSAR Subsection 9A.3.1.1.8, noncombustible barriers of steel or steel-composite construction form vertical shaft(s) from the floor up to the operating deck, surrounding the division B and D penetrations and the associated cable trays. The two passive residual heat removal (PRHR) heat exchanger control valves (tag nos. V108A/B) in Table 1 are redundant to one another and are separated from one another by a three-hour rated Durasteel fire separator. The power and control wiring for these valves (and other safety-related components) are protected from fire propagation in either closed cable trays or conduit. The B and D divisions are sufficient to perform functions (applicable to their systems) to achieve and maintain safe shutdown.

Following removal of the open cable tray fire suppression system, the division B and D electrical penetrations and their associated raceways in other fire zones remain protected from a fire in fire zone 11300B by a combination of barriers and distance. Noncombustible barriers of steel or steel-composite construction form vertical shaft(s) from the maintenance floor up to the operating deck, surrounding the division B and D penetrations and the associated cable trays. The predominant combustible materials in fire zone 11300B are the nonsafety-related cables routed in open cable trays. These nonsafety-related open cable trays are located at least 20 feet (in any direction) from the division B and D penetrations and their associated raceways routing cables for safe shutdown components.

The quantity of combustible materials in fire zone 11300B is low, consisting primarily of cable insulation in the termination boxes and cable trays. The prominent combustible materials in this fire zone are the nonsafety-related cables routed in open cable trays. Division A and C safety-related cables are routed in closed cable trays or conduit and are not affected by fires in open cable trays. However, for the purposes of the safe shutdown evaluation, the safety-related systems served by cables in fire zone 11300B are conservatively assumed to be rendered unavailable by the postulated fire. In fact, the nonsafety-related cable trays in fire zone 11300B are located at least 20 feet from the division B and D penetrations and their associated raceways routing cables for safe shutdown components. As indicated in UFSAR Table 9A-3, "Fire Protection Summary," fire zone 11300B has a fire duration (including trash and volatiles that will be administratively controlled) of less than three hours.

Following removal of the open-nozzle water spray fire suppression systems in fire zone 11300B, the smoke and heat generated in postulated fires in open cable trays will rise

through openings in the ceiling, or migrate via the large steel grating covered hatches between the containment maintenance hatch and the steam generator 2 compartment in the adjacent portions of the maintenance floor (fire zone 1100 AF 11300A), into the large air space in the upper portion of containment. The smoke and hot gases are cooled by mixing with the air and by contact with structural surfaces and thus do not cause propagation of the fire beyond fire zone 11300B. The safe shutdown components located in fire zones adjacent to fire zone 11300B are not susceptible to damage by the diluted and cooled smoke and gases from fire zone 11300B.

Table 2 – Non-Safety Cable Trays that Transition out of Fire Zone 1100 AF 11300B

Cable Tray Location / Orientation / Tag Number	Width of Cable Tray	Elevation of Fire Stop
Horizontal Trays between 11300B and 11300A		
1143-ER-NZT06D	6" tray	121'-5"
1143-ER-NZT06E	6" tray	129'-0"
Vertical Trays between 11300B and 11204		
1133-ER-NZT01K	6" tray	107'-7" *
1132-ER-NWT01A	36" tray	107'-7" *
1132-ER-NXT01AB	24" tray	107'-7" *
1132-ER-NXT02AB	24" tray	107'-7" *
1133-ER-NWT02A	24" tray	107'-7" *
1133- ER-NWT03A	12" tray	107'-7" *
Vertical Trays between 11300B and 11500		
1143-ER-NXT03AB	30" tray	131'-3" **
1143-ER-NZT06E	6" tray	132'-3"
1143-ER-NXT07BA(BB)	18" tray	132'-0"
1143-ER-NZT09A	6" tray	132'-0"
1143-ER-NXT10AA	36" tray	132'-0"
1143-ER-NXT12BA	6" tray	129'-6"
1143-ER-NXT04C	36" tray	132'-0"
1143-ER-NZT03C	24" tray	132'-0"
1143-ER-NZT01A	24" tray	130'-1" **
1143-ER-NZT02A	24" tray	130'-1" **

\* This elevation is below the maximum containment flood elevation of 110'

\*\* The passive fire stop is located in a horizontal section of this cable tray adjacent to the vertical section that penetrates the fire zone boundary

The removal of the open-nozzle water spray fire suppression systems in fire zone 11300B does not involve or adversely affect the ability of the FPS to detect and locate fires and provide operator indication of the location. When a fire is detected, the fire detection system produces an audible alarm locally, and both visual and audible alarms in the main control room and security central alarm station. The fire brigade reacts to control and extinguish the fire. No fire in fire zone 11300B can cause spurious actuations which could cause a breach in the reactor coolant boundary or defeat safety-related decay heat removal capability or cause an increase in shutdown reactivity of the reactor.

#### Administrative Procedures for Fire Protection

Administrative procedures for fire protection in fire zone 11300B can be divided into two overall categories: procedure in effect when containment is closed and when containment is open.

During power operation, transient combustibles in containment are controlled as part of the requirements for prevention containment sump debris. Any materials being brought into containment during power operations are controlled by site procedures for limiting sump debris. Transient combustibles in containment are controlled by the fire protection procedures as part of the overall site's transient combustible control procedure for the power block.

Procedures for combustible control are in place because of the need to perform various maintenance activities when containment is open. If additional combustibles are brought into containment during times when sump debris is not a concern, compensatory measures (such as a continuous fire watch or placement in a sealed metal box) are implemented in accordance with the site's transient combustible control procedure. Also, manual firefighting is readily available during outages when containment is open and combustible controls are relaxed.

The proposed changes do not adversely impact the emergency plan or the physical security plan implementation, because there are no changes to physical access to credited equipment inside the Nuclear Island (including containment or the auxiliary building) and no adverse impact to plant personnel's ability to respond to any plant operations or security event.

## **4. REGULATORY EVALUATION**

### **4.1 Applicable Regulatory Requirements/Criteria**

10 CFR 52.98(c) requires NRC approval for any modification to, addition to, or deletion from the terms and conditions of a COL. This activity involves a departure from COL Appendix C; therefore, this activity requires a proposed amendment to the COL.

10 CFR 52, Appendix D, VIII.A.4 states that exemptions from Tier 1 information are governed by the requirements in 10 CFR 52.63(b)(1) and 52.98(f). 10 CFR 52.63(b)(1) allows a licensee who references a design certification rule to request an exemption from Tier 1 information. 10 CFR 52.98(f) requires NRC approval for any modification to, addition to, or deletion from the terms and conditions of a COL. These activities

involve changes to figures in COL Appendix C, with corresponding changes to Tier 1 information in the associated plant-specific DCD. Therefore, NRC approval is required prior to making the proposed plant-specific changes in this license amendment request.

10 CFR 52, Appendix D, Section VIII.B.5.a allows a licensee who references Appendix D to depart from Tier 2 information, without prior NRC approval, unless the proposed departure involves a change to or departure from Tier 1 information, Tier 2\* information, or the Technical Specifications, or requires a license amendment under paragraphs B.5.b or B.5.c of Section VIII. As discussed above, the proposed changes to UFSAR Subsections 9.5.1 and 19.59 and Appendix 9A involve changes to Tier 1 information. Therefore, an exemption request is submitted with this license amendment request.

10 CFR Part 50, Appendix A, General Design Criterion (GDC) 3, "Fire protection," requires that Structures, systems, and components (SSCs) important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions. Noncombustible and heat resistant materials shall be used wherever practical throughout the unit, particularly in locations such as the containment and control room. Fire detection and fighting systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires on structures, systems, and components important to safety. Firefighting systems shall be designed to assure that their rupture or inadvertent operation does not significantly impair the safety capability of these structures, systems, and components. The passive fire stops are made of noncombustible material which has been tested in accordance with the Institute of Electrical and Electronics Engineers (IEEE) Standard 1202, "IEEE Standard for Flame-Propagation Testing of Wire and Cable" in a configuration representative of expected field installation. The test results demonstrated that the passive fire stops will prevent flame propagation along the nonsafety-related open cable trays beyond the passive fire stop for a 3-hour fire exposure. Additionally, removal of the cable tray spray system eliminates the possibility of a rupture or inadvertent actuation of said system to significantly impair the safety capability of other structures, systems, and components. Therefore, the use passive fire stops in lieu of the active cable tray spray system maintains compliance with GDC 3.

10 CFR Part 50, Appendix A, GDC 4, "Environmental and dynamic effects design bases," requires that SSCs important to safety be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. The nonsafety-related open cable trays in fire zone 1100 AF 11300B that will contain the passive fire stops are not located in the zone-of-influence (ZOI) of postulated high energy line breaks. Therefore, the proposed use of passive fire stops in these nonsafety-related cable trays in fire zone 11300B does not affect compliance with GDC 4.

10 CFR Part 50, Appendix A, GDC 35, "Emergency core cooling," requires that a system to provide abundant emergency core cooling be provided to transfer heat from

the reactor core following any loss of reactor coolant at a rate such that (1) fuel and clad damage that could interfere with continued effective core cooling is prevented, and (2) clad metal-water reaction is limited to negligible amounts. The passive core cooling system (PXS) provides reactor coolant system (RCS) emergency core cooling during design basis events by recirculating water condensed on the containment vessel through the RCS. The high density silicone elastomer (HDSE) material of the passive fire stops is made of non-fibrous high-density material (147 lbs/ft<sup>3</sup>) that exceeds the minimum density requirement of 100 lbs/ft<sup>3</sup> for coatings and sealants inside containment. The use of HDSE material for the construction of the fire stops precludes the transport of the fire stop material to the sump in the event of a high energy line break or other flooding event inside containment. Any fibrous material used as damming material is removed from the fire stop after the foam has cured and therefore will not be transported to the containment sumps during the recirculation phase of a design basis accident. In addition, the nonsafety-related open cable trays in fire zone 1100 AF 11300B that will contain the passive fire stops are not in the zone-of-influence (ZOI) of postulated high energy line breaks. Because the passive fire stops are made of a high-density material that exceeds the minimum density requirement of 100 lbs/ft<sup>3</sup>, are not in a ZOI, and also because they remain chemically stable in a flooded condition, the passive fire stops will not become sources of debris that might be generated following a design-basis accident. Therefore, the proposed changes do not affect compliance with GDC 35.

#### **4.2 Precedent**

No precedent is identified.

#### **4.3 Significant Hazards Consideration**

The requested amendment proposes a change to Updated Final Safety Analysis Report (UFSAR) Tier 2 information, which involves a change to Combined License (COL) Appendix C (and the corresponding plant-specific Design Control Document (DCD) Tier 1) information relative to the use of passive fire stops on cable trays in fire zone 11300B.

The requested amendment requires changes to Tier 2 information in UFSAR Subsections 9.5.1 and 19.59 and Appendix 9A, which involve changes to Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Figures 2.3.4-1 and 2.3.4-2 of COL Appendix C, and corresponding changes to the plant-specific DCD Tier 1 information.

The change to the UFSAR proposes the use of passive fire stops in lieu of an active cable tray spray system for containment fire zone 1100 AF 11300B. The use of passive fire stops is recognized by Regulatory Guide 1.189. The passive fire stops proposed in this requested amendment are designed and tested to show that fires will not propagate outside the fire zone. Additionally, the passive fire stop material-of-construction complies with in-containment refueling water storage tank (IRWST) and containment recirculation screens design criteria of UFSAR Subsection 6.3.2.2.7.1. Finally, the passive fire stops in nonsafety-related open cable trays are more reliable than active systems such as the current open nozzle cable tray

suppression system because they require no mechanical or human action to perform their protective function. When protection is required, there is no delay for operator or mechanical response.

An evaluation to determine whether or not a significant hazards consideration is involved with the proposed amendment was completed by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

**4.3.1 Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?**

Response: No.

The proposed changes do not affect the operation or reliability of any system, structure or component (SSC) required to maintain a normal power operating condition or to mitigate anticipated transients without safety-related systems. Testing has demonstrated that the passive fire stops prevent propagation of fires along the length of cable trays and prevent the propagation of cable tray fires to adjacent fire zones. The proposed changes do not affect the operation of equipment whose failure could initiate an accident previously analyzed. The existence or failure of passive fire stops in fire zone 1100 AF 11300B does not affect normal equipment operation.

The proposed changes do not adversely affect the reliability or function of an SSC relied upon to mitigate an accident previously analyzed. The existence or failure of passive fire stops in fire zone 1100 AF 11300B will not adversely affect passive core cooling system (PXS) performance during containment recirculation because the passive fire stops are located outside of the zone of influence (ZOI) of postulated high energy line breaks, and the passive fire stops' material-of-construction complies with in-containment refueling water storage tank (IRWST) and containment recirculation screens design criteria for debris generation and transport.

The existing active open nozzle cable tray suppression system is not fully automatic, is nonsafety-related, and is not credited in the probabilistic risk assessment (PRA). Therefore, replacing the active open nozzle cable tray suppression system with passive fire stops does not have an impact on PRA calculations and results.

Therefore, the proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

**4.3.2 Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?**

Response: No.

The proposed changes do not affect the operation of systems or equipment that could initiate a new or different kind of accident, or alter any SSC such that

a new accident initiator or initiating sequence of events is created. The use of passive fire stops is recognized by Regulatory Guide 1.189. The passive fire stops in nonsafety-related open cable trays are more reliable than active systems such as the current open nozzle cable tray suppression system because they require no mechanical or human action to perform their protective function. When protection is required, there is no delay for operator or mechanical response. Testing has demonstrated that the passive fire stops prevent propagation of fires along the length of cable trays and prevent the propagation of cable tray fires to adjacent fire zones.

The existence or failure of passive fire stops in fire zone 1100 AF 11300B will not adversely affect passive core cooling system (PXS) performance during containment recirculation because the passive fire stops are located outside of the zone of influence (ZOI) of postulated high energy line breaks, and their material-of-construction complies with in-containment refueling water storage tank (IRWST) and containment recirculation screens design criteria for debris generation and transport.

Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

**4.3.3 Does the proposed amendment involve a significant reduction in a margin of safety?**

Response: No.

The proposed changes do not affect existing safety margins. The current open nozzle cable tray suppression system is nonsafety-related. The use of passive fire stops is recognized by Regulatory Guide 1.189. The passive fire stops in nonsafety-related open cable trays are more reliable than active systems such as the current open nozzle cable tray suppression system because they require no mechanical or human action to perform their protective function. When protection is required, there is no delay for operator or mechanical response. Testing has demonstrated that the passive fire stops prevent propagation of fires along the length of cable trays and prevent the propagation of cable tray fires to adjacent fire zones.

Therefore, the proposed amendment does not involve a significant reduction in a margin of safety.

Based on the above, it is concluded that the proposed amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of “no significant hazards consideration” is justified.

**4.4 Conclusions**

Based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission’s

regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. The above evaluations demonstrate that the requested changes can be accommodated without an increase in the probability or consequences of an accident previously evaluated, without creating the possibility of a new or different kind of accident from any accident previously evaluated, and without a significant reduction in a margin of safety. Having arrived at negative declarations with regard to the criteria of 10 CFR 50.92, this assessment determined that the requested change does not involve a Significant Hazards Consideration.

## 5. ENVIRONMENTAL CONSIDERATIONS

Southern Nuclear Operating Company (SNC or "Licensee") is requesting an amendment to Combined License (COL) Nos. NPF-91 and NPF-92 for Vogtle Electric Generating Plant (VEGP) Units 3 and 4, respectively. The requested amendment proposes a change to Updated Final Safety Analysis Report (UFSAR) Tier 2 information, which involves a change to COL Appendix C (and the corresponding plant-specific Design Control Document (DCD) Tier 1) information relative to the use of passive fire stops in lieu of an active cable tray spray system for containment fire zone 1100 AF 11300B.

The requested amendment requires changes to Tier 2 information in UFSAR Subsections 9.5.1 and 19.59 and Appendix 9A, which involve changes to Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Figures 2.3.4-1 and 2.3.4-2 of COL Appendix C, and corresponding changes to the plant-specific DCD Tier 1 information.

The change to the UFSAR proposes the use of passive fire stops in lieu of an active cable tray spray system for containment fire zone 1100 AF 11300B. The use of passive fire stops is recognized by Regulatory Guide 1.189. The passive fire stops in nonsafety-related open cable trays are more reliable than active systems such as the current open nozzle cable tray suppression system because they require no mechanical or human action to perform their protective function. When protection is required, there is no delay for operator or mechanical response.

Sections 2 and 3 of this license amendment request provide the details of the proposed changes.

The Licensee has determined that the anticipated construction and operational effects of the proposed amendment meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9), in that:

(i) *There is no significant hazards consideration.*

As documented in Section 4.3, Significant Hazards Consideration, of this license amendment request, an evaluation was completed to determine whether or not a significant hazards consideration is involved by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment." The Significant Hazards Consideration determined that (1) the requested amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated; (2) the requested amendment does not create the possibility of a new or different kind of accident from any

accident previously evaluated; and (3) the requested amendment does not involve a significant reduction in a margin of safety. Therefore, it is concluded that the requested amendment does not involve a significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

- (ii) *There is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite.*

The proposed changes do not affect any aspect of plant construction or operation that introduces a change to any effluent types (for example effluents containing chemicals or biocides, sanitary system effluents, and other effluents), and do not affect any plant radiological or non-radiological effluent release quantities. The proposed changes do not affect the functionality of any design feature or operational arrangements credited with controlling the release of effluents during plant operation. The passive core cooling system and the containment vessel work in concert to maintain core cooling and mitigate the release of radiation during design basis events. The passive fire stops are made of a high-density material that exceeds the minimum density requirement of 100 lbs/ft<sup>3</sup>, are not in a zone of influence (ZOI), and remain chemically stable in a flooded condition. Accordingly, there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite. Therefore, it is concluded that the requested amendment does not involve a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite.

- (iii) *There is no significant increase in individual or cumulative occupational radiation exposure.*

The proposed changes do not affect walls, floors, or other structures that provide radiation shielding. The use of passive fire stops in fire zone 1100 AF 11300B is not anticipated to require increased maintenance or inspection inside containment. Furthermore, company and station policies maintain radiation exposure of personnel within limits defined by 10 CFR Part 20, "Standards for Protection Against Radiation." Administrative procedures and practices are implemented to maintain radiation exposure of personnel as low as is reasonably achievable. Therefore, it is concluded that the requested amendment does not involve a significant increase in individual or cumulative occupational radiation exposure.

Based on the above review of the requested amendment, it has been determined that anticipated construction and operational effects of the requested amendment do not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the requested amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental impact statement or environmental assessment of the proposed amendment is not required.

ND-18-0593

Enclosure 1

Request for License Amendment Regarding Fire Protection System Non-Safety Cable Spray  
Removal (LAR-18-015)

## **6. REFERENCES**

None.

**Southern Nuclear Operating Company**

**ND-18-0593**

**Enclosure 2**

**Vogtle Electric Generating Plant (VEGP) Units 3 and 4**

**Exemption Request:**

**Fire Protection System Non-Safety Cable Spray Removal**

**(LAR-18-015)**

(This Enclosure consists of 9 pages, including this cover page.)

## 1.0 Purpose

Southern Nuclear Operating Company (the Licensee) requests a permanent exemption from the provisions of 10 CFR 52, Appendix D, Section III.B, *Design Certification Rule for the AP1000 Design, Scope and Contents*, to allow a departure from elements of the certification information in Tier 1 of the generic AP1000 Design Control Document (DCD). The regulation, 10 CFR 52, Appendix D, Section III.B, requires an applicant or licensee referencing Appendix D to 10 CFR Part 52 to incorporate by reference and comply with the requirements of Appendix D, including certified information in DCD Tier 1. The Tier 1 information for which a plant-specific departure and exemption is being requested includes removal of the containment cable tray spray system.

This request for exemption provides the technical and regulatory basis to demonstrate that 10 CFR 52.63, §52.7, and §50.12 requirements are met and will apply the requirements of 10 CFR 52, Appendix D, Section VIII.A.4 to allow departures from generic Tier 1 information due to a proposed change to Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) Figures 2.3.4-1 and 2.3.4-2 to depict removal of the containment cable tray spray system.

## 2.0 Background

The Licensee is the holder of Combined License Nos. NPF-91 and NPF-92, which authorize construction and operation of two Westinghouse Electric Company AP1000 nuclear plants, named Vogtle Electric Generating Plant (VEGP) Units 3 and 4, respectively.

An open-nozzle water spray suppression system is provided for nonsafety-related electrical cables routed in open cable trays in fire zone 1100 AF 11300B (fire zone 11300B) which is part of room number 11300 whose floor is at elevation 107'-2". Safety-related cables (in room number 11300 and elsewhere) are routed in closed cable trays or conduit. Physical distance and structural barriers are credited for protection of the safety-related cables. Absent the ability to implement complete fire barrier separation of the nonsafety-related electrical cable trays, the purpose of the open nozzle water spray suppression system is to provide additional assurance that a fire will not propagate via the nonsafety-related electrical cable trays in fire zone 11300B to another fire zone. Actuation of the suppression system requires a manual operator action to open the outboard containment isolation valve. The outboard containment isolation valve is manually actuated to prevent spurious actuation.

The fire protection system (FPS) open-nozzle suppression system that feeds into containment is used to spray nonsafety-related open cable trays. The FPS open-nozzle suppression system is designed to mitigate extensive burning of nonsafety-related cables that could propagate to another fire zone and adversely affect safe shutdown components in another fire zone during a fire event.

There is no credit taken for the FPS open-nozzle suppression system to operate following a seismic event, as there are no requirements to consider a fire event concurrent with any other plant accident including a seismic event.

Safety-related cables are routed in closed cable trays or conduit. For open cable trays, which represent the only significant in-situ combustibles in fire zone 11300B during power operations, an open-nozzle water spray suppression system is provided. The purpose of the water spray suppression system is to prevent a fire in the nonsafety-related electrical cables in open cable trays from propagating to another fire zone from fire zone 11300B.

The open-nozzle water spray suppression system control valves are initiated automatically upon receipt of a fire detection signal based on heat detectors located in the nonsafety-related cable tray. The initiation of water suppression spray relies on the operation of multiple active components such as the fire detection system. Upon initiation of a fire signal (heat detection) the fire detection system control panel sends a signal to activate the opening of FPS open-nozzle water spray motor control valves.

However, the open-nozzle water spray suppression system is not fully automatic and to preclude inadvertent actuation and unnecessary water deluge of the maintenance floor and adjacent areas in containment, manual operator action is required to open the outboard FPS containment isolation valve. There are no normally closed isolation/control valves downstream of the outboard FPS containment isolation valve. Water that enters the open-nozzle water spray suppression system after initiation of the heat detection and activation of the motor control valve will be discharged through the nozzles into the open nonsafety-related cable trays of fire zone 11300B.

The open-nozzle water spray suppression system requires more than 400 open nozzles and a substantial amount of piping and associated piping supports in order to accomplish its fire suppression function. These piping and supports involve complex design, construction, and maintenance issues and add to the congestion in the area of room number 11300.

Therefore, to reduce the need for manual valve manipulation outside the control room and to reduce the piping/support congestion and constructability issues in containment caused by the open-nozzle water spray suppression system, it is proposed to replace the open-nozzle water spray suppression system for open nonsafety-related cable trays in fire zone 11300B with passive fire stops. The passive fire stops will be placed in the open nonsafety-related cable trays at the point where the cable trays transition out of fire zone 11300B. The purpose of the passive fire stops is to prevent a fire in the open nonsafety-related electrical cable trays in fire zone 11300B from propagating to an adjacent fire zone.

### **3.0 Technical Justification of Acceptability**

The passive fire stops that are proposed to replace the open-nozzle water spray suppression system in fire zone 11300B consist of an engineered and tested configuration that will be mounted in the nonsafety-related open cable trays. These passive fire stops will be placed in the nonsafety-related open cable trays near the boundary of fire zone 11300B prior to where the trays continue into adjacent fire zones. The purpose of the passive fire stops is to prevent a fire in the nonsafety-related open cable trays of fire zone 11300B from propagating to another fire zone.

As noted in UFSAR Subsection 9A.3.1.1, "Containment/Shield Building," fire zone 11300B (in Subsection 9A.3.1.1.8) is the maintenance floor (north half). As shown in UFSAR Figure 9A-1, Sheet 5 of 16, "Nuclear Island Fire Areas Plan at Elevation 100'-0" & 107'-2"," room number 11300 is the maintenance floor at elevation 107'-2". Room 11300 is located to the plant north of the reactor cavity, continues east and south around the outside of the steam generator 2 enclosure and then west to the east wall of the refueling cavity. Room 11300 is divided into two fire zones: Fire Zone 1100 AF 11300A is the plant southeast area of Room 11300 and Fire Zone 1100 AF 11300B is the plant north area of room 11300. Except for the circuitous arrangement of room number 11300 among the containment internal structures (reactor cavity and steam generator enclosures), there are no physical barriers between fire zones 1100 AF 11300A and 1100 AF 11300B at elevation 107'-2".

As discussed in UFSAR Subsection 9A.3.1.1.8, "Fire Zone 1100 AF 11300B," the combustible materials in this fire zone consist primarily of cable insulation in the termination boxes and open cable trays. As shown in Table 9A-3, "Fire Protection Summary," combustible loadings are conservatively increased in fire zone 11300B with the addition of unspecified trash and volatiles (only expected during refueling outage maintenance activities) such that along with the known cable insulation combustibles, the equivalent fire duration is calculated to be less than three hours.

As Discussed in UFSAR Subsection 9A.3.1.1.8, "The quantity and arrangement of combustible materials in this fire zone, and the characteristics of the barriers that separate this zone from other fire zones are such that a fire which damages safe shutdown components in this fire zone does not propagate to the extent that it damages redundant safe shutdown components in another fire zone."

As stated in the UFSAR Subsection 9A.3.1.1.8, "...open-nozzle water spray suppression systems are provided for nonsafety-related electrical cables routed in open cable trays in fire zone 1100 AF 11300B, providing additional assurance that a fire will not propagate between these fire zones."

Fire barrier separation is not required within the containment fire area (including the middle and upper annulus zones of the shield building). Fire protection within the containment fire area is accomplished by minimizing the quantity of combustible materials, and by the use of spatial separation combined with appropriate fire detection and manual fire protection capabilities. Fire protection features are sufficient to ensure that one train of safe shutdown equipment will remain undamaged in the event of a fire inside containment.

From the standpoint of fire zone separation, fire zone 11300B is physically separated from fire zones at lower elevations by the maintenance floor, which has a concrete thickness of more than one foot, except for access stairways and hatches. Fire zone 11300B is separated from the operating deck above by a ceiling that has a concrete thickness of more than one foot, except for several openings (access stairway, elevator, etc.). The perimeter of fire zone 11300B consists of the steel containment vessel, the steel wall of the in-containment refueling water storage tank, the noncombustible enclosure for the division B and D penetrations and raceways (room number 11306, fire

zone 1100 AF 11500), and the reactor cavity and steam generator enclosure walls (having a concrete thickness of more than one foot).

The use passive fire stops in fire zone 1100 AF 11300B performs the same function as the active cable tray spray system in preventing a fire in the nonsafety-related open cable trays of fire zone 1100 AF 11300B from propagating to another fire zone. Additionally, the passive fire stops perform this function without operator action or the use of active components. Therefore, it will not adversely affect the ability of the fire protection system (FPS) to prevent a fire in the nonsafety-related open cable trays of fire zone 1100 AF 11300B from propagating to another fire zone.

The use passive fire stops in lieu of the active cable tray spray system in fire zone 1100 AF 11300B will not adversely affect passive core cooling system (PXS) performance during containment recirculation because the passive fire stops are located outside of the zone of influence (ZOI) of postulated high energy line breaks, and the passive fire stops' material-of-construction complies with in-containment refueling water storage tank (IRWST) and containment recirculation screens design criteria for debris generation and transport.

Detailed technical justification supporting this request for exemption is provided in Section 3 of the associated License Amendment Request in Enclosure 1 of this letter.

#### **4.0 Justification of Exemption**

10 CFR Part 52, Appendix D, Section VIII.A.4 and 10 CFR 52.63(b)(1) govern the issuance of exemptions from elements of the certified design information for AP1000 nuclear power plants. Since SNC has identified changes to the Tier 1 information as discussed in Enclosure 1 of the accompanying License Amendment Request, an exemption from the certified design information in Tier 1 is needed.

10 CFR Part 52, Appendix D, and 10 CFR 50.12, §52.7, and §52.63 state that the NRC may grant exemptions from the requirements of the regulations provided six conditions are met: 1) the exemption is authorized by law [§50.12(a)(1)]; 2) the exemption will not present an undue risk to the health and safety of the public [§50.12(a)(1)]; 3) the exemption is consistent with the common defense and security [§50.12(a)(1)]; 4) special circumstances are present [§50.12(a)(2)]; 5) the special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption [§52.63(b)(1)]; and 6) the design change will not result in a significant decrease in the level of safety [Part 52, App. D, VIII.A.4].

The requested exemption satisfies the criteria for granting specific exemptions, as described below.

##### **1. This exemption is authorized by law**

The NRC has authority under 10 CFR 52.63, §52.7, and §50.12 to grant exemptions from the requirements of NRC regulations. Specifically, 10 CFR 50.12 and §52.7 state that the NRC may grant exemptions from the requirements of 10 CFR Part 52 upon a proper showing. No law exists that would preclude the changes covered by this exemption request. Additionally, granting of the proposed exemption does not result in a

violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations.

Accordingly, this requested exemption is "authorized by law," as required by 10 CFR 50.12(a)(1).

**2. This exemption will not present an undue risk to the health and safety of the public**

The proposed exemption from the requirements of 10 CFR 52, Appendix D, Section III.B would allow changes to elements of the plant-specific Tier 1 DCD to depart from the AP1000 certified (Tier 1) design information. The plant-specific DCD Tier 1 will continue to reflect the approved licensing basis for VEGP Units 3 and 4, and will maintain a consistent level of detail with that which is currently provided elsewhere in Tier 1 of the DCD. Therefore, the affected plant-specific DCD Tier 1 ITAAC will continue to serve its required purpose.

The change to allow for the use passive fire stops in lieu of an active cable tray spray system does not represent an adverse impact to the design functions provided by the fire protection system, nor to the safety function of the passive core cooling system, which will continue to protect the health and safety of the public by preventing flame propagation and providing reactor coolant system (RCS) emergency core cooling during design basis events. The change does not introduce any new industrial, chemical, or radiological hazards that would represent a public health or safety risk, nor do they modify or remove any design or operational controls or safeguards intended to mitigate any existing on-site hazards. Furthermore, the proposed change would not allow for a new fission product release path, result in a new fission product barrier failure mode, or create a new sequence of events that would result in fuel cladding failures. Accordingly, this change does not present an undue risk from any existing or proposed equipment or systems.

Therefore, the requested exemption from 10 CFR 52, Appendix D, Section III.B would not present an undue risk to the health and safety of the public.

**3. The exemption is consistent with the common defense and security**

The requested exemption from the requirements of 10 CFR 52, Appendix D, Section III.B would allow the licensee to depart from elements of the plant-specific DCD Tier 1 design information. The proposed exemption does not alter the design, function, or operation of any structures or plant equipment that are necessary to maintain a safe and secure status of the plant. The proposed exemption has no impact on plant security or safeguards procedures.

Therefore, the requested exemption is consistent with the common defense and security.

**4. Special circumstances are present**

10 CFR 50.12(a)(2) lists six "special circumstances" for which an exemption may be granted. Pursuant to the regulation, it is necessary for one of these special

circumstances to be present in order for the NRC to consider granting an exemption request. The requested exemption meets the special circumstances of 10 CFR 50.12(a)(2)(ii). That subsection defines special circumstances as when "Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule."

The rule under consideration in this request for exemption is 10 CFR 52, Appendix D, Section III.B, which requires that a licensee referencing the AP1000 Design Certification Rule (10 CFR Part 52, Appendix D) shall incorporate by reference and comply with the requirements of Appendix D, including Tier 1 information. The VEGP Units 3 and 4 COLs reference the AP1000 Design Certification Rule and incorporate by reference the requirements of 10 CFR Part 52, Appendix D, including Tier 1 information. The underlying purpose of Appendix D, Section III.B is to describe and define the scope and contents of the AP1000 design certification, and to require compliance with the design certification information in Appendix D.

The proposed exemption would allow the use of passive fire stops in lieu of an active cable tray spray system for containment fire zone 1100 AF 11300B.

The proposed exemption does not adversely affect the design function of the PXS, because the proposed fire stop material exceeds the minimum density requirements for transport specified in the UFSAR and does not result in adverse chemical effects when flooded during a design basis event. The use passive fire stops in lieu of an active cable tray spray system for containment fire zone 1100 AF 11300B provides an acceptable alternative for prevention of flame propagation. Additionally, the passive fire stops perform this function without operator action or the use of active components. Accordingly, this exemption from the certification information enables the Licensee to safely construct and operate the AP1000 facility consistent with the design certified by the NRC in 10 CFR 52, Appendix D.

Therefore, special circumstances are present, because application of the current generic certified design information in Tier 1 as required by 10 CFR Part 52, Appendix D, Section III.B, in the particular circumstances discussed in this request is not necessary to achieve the underlying purpose of the rule.

**5. The special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption.**

Based on the nature of the changes to the plant-specific Tier 1 information and the understanding that these changes support the design function of the supported equipment, it is expected that this exemption may be requested by other AP1000 licensees and applicants. However, a review of the reduction in standardization resulting from the departure from the standard DCD determined that even if other AP1000 licensees and applicants do not request this same departure, the special circumstances will continue to outweigh any decrease in safety from the reduction in standardization because the key design functions of the equipment associated with this request will continue to be maintained. Furthermore, the justification provided in the license amendment request and this exemption request and the associated mark-ups

demonstrate that there is a limited change from the standard information provided in the generic AP1000 DCD, which is offset by the special circumstances identified above.

Therefore, the special circumstances associated with the requested exemption outweigh any decrease in safety that may result from the reduction in standardization caused by the exemption.

**6. The design change will not result in a significant decrease in the level of safety.**

The exemption revises the plant-specific DCD Tier 1 information to remove the active cable tray spray system in fire zone 1100 AF 11300B. The active cable tray spray system in fire zone 1100 AF 11300B is replaced with passive fire stops, which perform the same function of preventing flame propagation. Additionally, the use of passive fire stops does not adversely affect the ability of the passive core cooling system to perform its function of providing emergency core cooling during design basis events. Because these functions continue to be met, there is no reduction in the level of safety.

**5.0 Risk Assessment**

A risk assessment was not determined to be applicable to address the acceptability of this proposal.

**6.0 Precedent Exemptions**

None

**7.0 Environmental Consideration**

The Licensee requests a departure from elements of the certified information in Tier 1 of the generic AP1000 DCD. The Licensee has determined that the proposed departure would require a permanent exemption from the requirements of 10 CFR 52, Appendix D, Section III.B, *Design Certification Rule for the AP1000 Design, Scope and Contents*, with respect to installation or use of facility components located within the restricted area, as defined in 10 CFR Part 20, or which changes an inspection or a surveillance requirement; however, the Licensee evaluation of the proposed exemption has determined that the proposed exemption meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9).

Based on the above review of the proposed exemption, the Licensee has determined that the proposed activity does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed exemption meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), an environmental impact statement or environmental assessment of the proposed exemption is not required.

Specific details of the environmental considerations supporting this request for exemption are provided in Section 5 of the associated License Amendment Request provided in Enclosure 1 of this letter.

## **8.0 Conclusion**

The proposed changes to Tier 1 are necessary to allow the use of passive fire stops in lieu of an active cable tray spray system for containment fire zone 1100 AF 11300B. The exemption request meets the requirements of 10 CFR 52.63, *Finality of design certifications*, 10 CFR 52.7, *Specific exemptions*, 10 CFR 50.12, *Specific exemptions*, and 10 CFR 52 Appendix D, *Design Certification Rule for the AP1000*. Specifically, the exemption request meets the criteria of 10 CFR 50.12(a)(1) in that the request is authorized by law, presents no undue risk to public health and safety, and is consistent with the common defense and security. Furthermore, approval of this request does not result in a significant decrease in the level of safety, satisfies the underlying purpose of the AP1000 Design Certification Rule, and does not present a significant decrease in safety as a result of a reduction in standardization.

## **9.0 References**

None.

**Southern Nuclear Operating Company**

**ND-18-0593**

**Enclosure 3**

**Vogtle Electric Generating Plant (VEGP) Units 3 and 4**

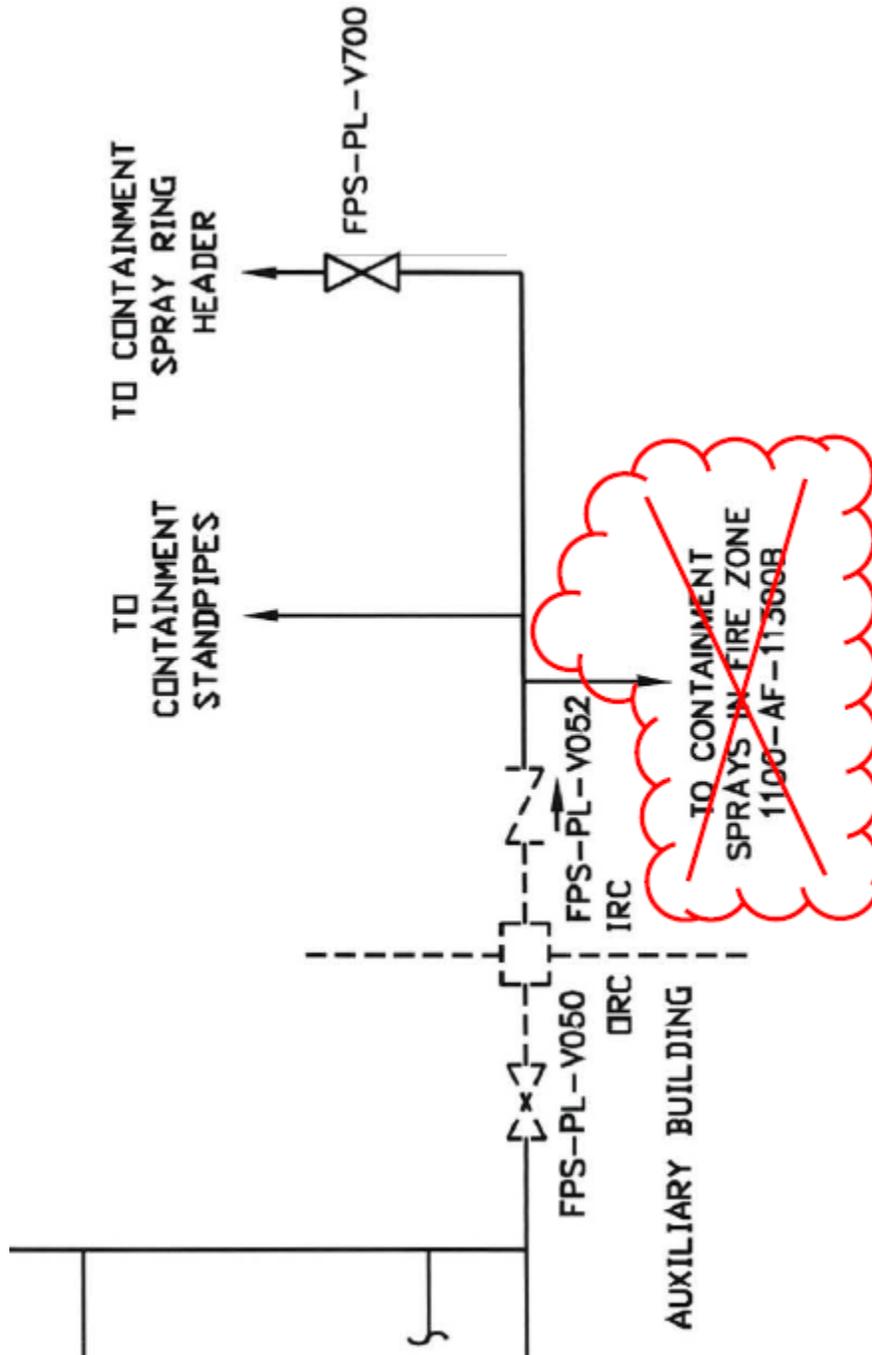
**Proposed Changes to Licensing Basis Documents**

**(LAR-18-015)**

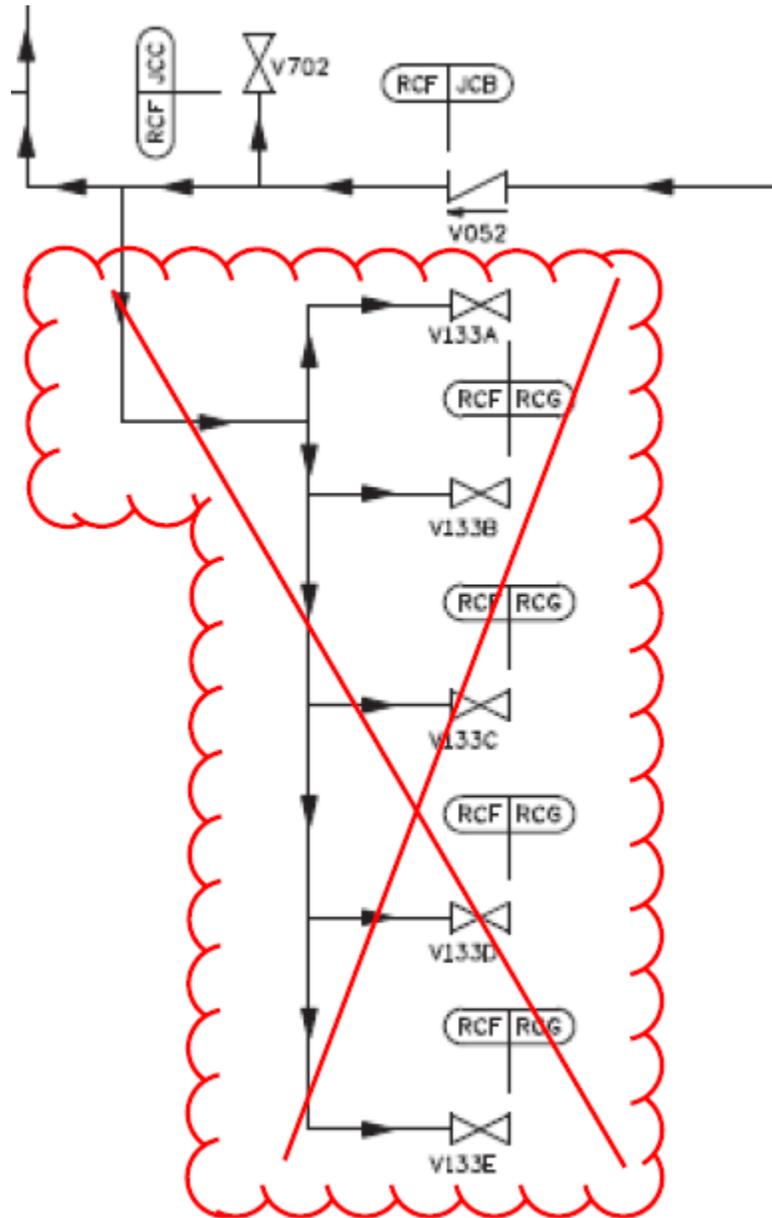
**Insertions Denoted by Blue Underline and Deletions by ~~Red~~ Strikethrough  
Omitted text is identified by three asterisks ( \* \* \* )**

(This Enclosure consists of 8 pages, including this cover page.)

Revise COL Appendix C (and corresponding plant-specific Tier 1) Figure 2.3.4-1, sheet 2 to remove the depiction of containment water spray piping to fire zone 1100 AF 11300B (shown in bubble) as shown below:



Revise COL Appendix C (and corresponding plant-specific Tier 1) Figure 2.3.4-2 to remove the depiction of containment cable tray spray piping and valves (shown in bubble) as shown below:



**Revise UFSAR Table 9.5.1-3, to delete the cable tray spray table entry, as shown below:**

Requirement	AP1000 Exception or Clarification
<del>NFPA 15 Section 5.7.2.1 requires that all actuation valves shall be listed.</del>	<del>The cable tray deluge spray system actuation valves located inside containment are not listed by a recognized organization as required by NFPA 15. Commercially available listed actuation valves are not available for the unique requirement of installation inside containment as water will be isolated to the system during normal plant operation, which may cause a standard deluge valve to inadvertently open when the water supply is restored. Motor-operated butterfly valves, with manual override capability that fails in the "as is" position, will be used. The valves will be operated from the fire alarm system in a similar manner to a standard deluge valve. The design features of the cable spray actuation valve meet the intent of NFPA 15 for a deluge valve.</del>



**Revise UFSAR Subsection 9A.3.1.1, Containment/Shield Building, by removing water spray systems in specific locations from the list of fire detection and suppression systems as shown below:**

**9A.3.1.1 Containment/Shield Building**

\* \* \*

**Fire Detection and Suppression Features**

- Fire detectors
- Hose station(s)
- Portable fire extinguishers (during reactor shutdown for maintenance)
- ~~Water spray systems in specific locations~~

**Revise UFSAR Subsection 9A.3.1.1.7, Fire Zone 1100 AF 11300A, by replacing open nozzle water spray suppression systems with passive fire stops as shown below:**

**9A.3.1.1.7 Fire Zone 1100 AF 11300A**

\* \* \*

**Safe Shutdown Evaluation**

\* \* \*

raceway of one division can propagate to a raceway of another division. Furthermore, ~~open-nozzle water spray suppression systems~~ passive fire stops are provided for nonsafety-related electrical cables routed in open cable trays in fire zone 1100 AF 11300B (there are no such cable trays in fire zone 1100 AF 11300A), providing additional assurance that a fire will not propagate between these fire zones.

**Revise UFSAR Subsection 9A.3.1.1.8, Fire Zone 1100 AF 11300B, by replacing open nozzle water spray suppression systems with passive fire stops as shown below:**

**9A.3.1.1.8 Fire Zone 1100 AF 11300B**

\* \* \*

**Safe Shutdown Evaluation**

\* \* \*

Safety-related cables are routed in closed cable trays or conduit. For open cable trays, which represent the only significant in-situ combustibles in [fire zone 1100 AF 11300B](#), [passive fire stops are provided to prevent postulated fires in these open cable trays from propagating to an adjacent fire zone](#)~~this fire zone, open nozzle water spray suppression systems are provided. These systems are automatic except that, to preclude inadvertent actuation, operator action is required to open the outboard containment isolation valve. These suppression systems rapidly extinguish a fire in these cable trays and prevent fire propagation to adjacent fire zones.~~

~~The use of water spray systems for the open cable trays in this fire zone limits smoke and heat generation. Small quantities of smoke~~ [Smoke](#) and hot gases from a fire in this fire zone rise through openings in the ceiling, or migrate via the large steel grating covered hatches between the containment maintenance hatch and the steam generator 2 compartment in the adjacent portions of the maintenance floor (fire zone 1100 AF 11300A), into the large air space in the upper portion of containment.

\* \* \*

These division B and D electrical penetrations and their associated raceways are protected from a fire in this fire zone by a combination of barriers, distance and [passive fire stops](#)~~fire suppression systems~~. Noncombustible barriers of steel or steel-composite construction form vertical shaft(s) from the floor up to the operating deck, surrounding the division B and D penetrations and the associated cable trays. The significant combustible materials in this fire zone are the nonsafety-related cables routed in open cable trays. These cable trays are located at least 20 feet from the division B and D penetrations and their associated raceways, and they are [provided with passive fire stops to prevent postulated fires in these open cable trays from propagating to an adjacent fire zone](#)~~protected by water spray suppression systems~~.

**Revise UFSAR Table 9A-3, Fire Protection Summary, by removing water spray fixed suppression capability from fire zone 1100 AF 11300B as shown below:**

Fire Area/Zone <sup>(1)</sup>	Safety Area <sup>(2)</sup>	Floor Area Sq Ft	Combust. Material <sup>(3)</sup>	Fire Sev. Cat.	Amount	Heat Value (Btu)	Comb. Load, Btu/Sq Ft	Equiv. Dur. (Min)	Boundary Fire Res. <sup>(4)</sup> (Hours)	Detect. Cap.	Fixed Suppression Capability <sup>(5)</sup>
* * *											
1100 AF 11300B MAINTENANCE FLOOR NORTH		3725	CABLE INS TRASH VOLATILES NET CAT.	C B E D	10000 1000 40 TOTAL	1.0E+08 7.7E+06 5.4E+06 1.2E+08	31,000	23			<del>WATER SPRAY HOSE STATION</del>
* * *											

**Revise UFSAR Table 19.59-18, AP1000 PRA-Based Insights, Item 80 as shown below:**

Insight	Disposition
* * *	* * *
80. An analysis is provided that demonstrates that operator actions, which minimize the probability of the potential for spurious ADS actuation as a result of a fire, can be accomplished within 30 minutes following detection of the fire and the procedure for the manual actuation of the valve to allow fire water to reach the <del>automatic</del> -fire system in the containment- <del>maintenance floor</del> .	* * *
* * *	* * *