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Southern Nuclear Operating Company
Vogtle Electric Generating Plant Units 3 and 4
Revised Request for License Amendment:
Structural Design of Auxiliary Building Floors (LAR-16-009R1)

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). SNC originally submitted this request as ND-16-0816 with a broader scope on June 14, 2016. The requested amendment is herein revised to limit the scope to depart from Tier 2* and associated Tier 2 information in the Updated Final Safety Analysis Report (UFSAR) (which includes the plant-specific DCD Tier 2 information) to revise details of the structural design of auxiliary building floors within module CA20 at approximate design elevations of 82'-6" and 92'-6".

Enclosures 1 and 2 with the original submittal are replaced in their entirety with Enclosures 3 and 4 of this revised request. Enclosure 3 provides the description, technical evaluation, regulatory evaluation (including the Significant Hazards Consideration determination) and environmental considerations for the proposed changes. Enclosure 4 provides the revised markups depicting the requested changes to the VEGP Units 3 and 4 UFSAR.

This letter contains no regulatory commitments.

The technical documentation supporting the information identified in this license amendment request (LAR) is complete. A preliminary amendment request (PAR) is also being considered seeking a no objection finding for work that is ready to proceed within the CA20 module. The supporting technical documentation for requested activities under the PAR is also complete.

SNC requests NRC staff approval of the license amendment by October 17, 2016, to support continued installation of auxiliary building floor modules. Approval by this date will allow sufficient time to implement the licensing basis changes prior to final installation of the affected auxiliary building floors. SNC expects to implement this proposed amendment within 30 days of approval.

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 enclosures to the designated State Official.

Should you have any questions, please contact Mr. Jason Redd at (205) 992-6435.

Mr. Michael J. Yox states that: he is the Regulatory Affairs Director, Vogtle 3 and 4, Nuclear Development, of Southern Nuclear Operating Company; he is authorized to execute this oath on behalf of Southern Nuclear Operating Company; and to the best of his knowledge and belief, the facts set forth in this letter are true.

Respectfully submitted,

SOUTHERN NUCLEAR OPERATING COMPANY

Michael J. Yox

MJY/ERG/ljs

Sworn to and subscribed before me this 1st *day of* July *2016*

Notary Public: Notary Public, Richmond Co., GA My Commission Expires 8/2/16

My commission expires:

RABIYYAH M. JONES NOTARY PUBLIC RICHMOND COUNTY, GA. My Comm. Exp. August 2, 2016

Enclosures: 3) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Revised Request for License Amendment Regarding Structural Design of Auxiliary Building Floors (LAR-16-009R1)

4) Vogtle Electric Generating Plant (VEGP) Units 3 and 4 – Proposed Changes to Licensing Basis Documents (LAR-16-009R1)

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Southern Nuclear Operating Company

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

ND-16-1024

Enclosure 3

Revised Request for License Amendment Regarding Structural Design of Auxiliary Building Floors (LAR-16-009R1)

(This Enclosure consists of 17 pages, including this cover page)

Table of Contents

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

1. Summary Description

Changes are proposed to the Updated Final Safety Analysis Report (UFSAR) descriptions and figures to address changes in the structural design of selected floors in the auxiliary building. The changes apply to selected floors at or near the 82′-6″ and 92′-6″ design elevation in the south end of the auxiliary building. These selected floors include the following room located in the CA20 structural module at design elevation 82′-6″: Piping/Valve Room (Room number 12262), and to the following rooms located at or near design elevation 92′-6″: Pipe Chase (Room number 12269), Cask Loading Pit (Room number 12463), Spent Fuel Storage Pit (Room number 12563) and Waste Monitor Tank Room B (Room number 12365). These floors are part of the CA20 module. The UFSAR text and figures that are proposed to be changed provide information for these floors and are identified as Tier 2* information or as changes in Tier 2 information that are related to involved Tier 2* information. Changes include proposed modifications to define how concrete on steel plate floors without fins can be different from the finned floor critical section in the design details. The variations in the detail design, which include information such as size and spacing of reinforcement in the floors and the spans of the floors, are the result of variations in the geometry of the floors and variations in the loads for which the floors are designed. The floor designs with the design variations satisfy design code requirements in ACI 349 and AISC N690.

This activity clarifies the floor to wall connection design for selected concrete on steel plate floors in the auxiliary building as represented in UFSAR Figure 3H.5-9, Sheet 2. These clarifications provide additional details on the use of the code requirements for the connection design. This activity changes the description for the floors in the auxiliary building by specifying requirements for length of the connecting dowel and capacity of the shear studs. The connection length requirements use the ACI 349 requirements for splice length.

2. Detailed Description

Change Activity 1 – Concrete on Steel Plate Floor Variations

Issue Description

UFSAR Figure 3H.5-9 shows a critical section and is identified as typical of the finned floor design and is representative of concrete on steel plate floors without fins. This figure is based on the detail design of the floor above the main control room. The design details of the CA20 module floors at or near the 82′-6″ and 92′-6″ design elevation in the south end of the auxiliary building vary from that shown; however, the fact that these design details vary at other locations

from those shown is not explicitly stated. Changes to the critical section figure and the referencing text are needed to explain the variances.

Proposed Change

Revise the critical section figure, UFSAR Figure 3H.5-9, to add notes about variations from the finned floor design and code requirements involved in the variations. The information added does not change the compliance of the floor design with codes and standards, including ACI 349 and AISC N690.

Change Activity 2 – Not used

Change Activity 3 – Not Used

Change Activity 4 – Not Used

Change Activity 5 – Design of Floor to Wall Connection

Issue Description

Proposed design changes are identified to the detail reinforcement design of the floor to wall connection represented in UFSAR Figure 3H.5-9, Sheet 2. The figure shows a floor to wall connection including reinforcement dowels connected to the wall and studs attached to the steel plate on the bottom of the floor. The figure identifies a length for the dowel for the critical section. The dowel length used for the critical section is not used for floors at or near the 82′-6″ and 92′-6″ design elevation in the south end of the auxiliary building.

Proposed Change

On UFSAR Figure 3H.5-9, Sheet 2, a note (4) is added to address the range of size and spacing of the connecting dowel, and a note (5) is added to address variation in the length dimension of the reinforcement bar dowel. This activity does not change the design basis or design methodology for the connection between the floor and wall. The connection design was approved as part of the AP1000 design as represented in UFSAR Figure 3H.5-9, Sheet 2. However, the details of the design methodology and design basis of the connection are not specified or discussed in the UFSAR. These details are added as notes on the figure addressing splice length criteria and stud sizing and spacing, and a supplemental evaluation was conducted to document the basis for the connection design and methodology. These notes are applicable to selected floors at or near the 82′-6″ and 92′-6″ design elevation in the south end of the auxiliary building. The supplemental evaluation demonstrates in detail that the force transfer in the connection design satisfies the ACI 349 and AISC N690 code requirements and appropriately transfers the loads through the connection. Therefore, the supplemental evaluation demonstrates the applicability of the ACI 349 and AISC N690 code requirements.

Note 4 also allows for variation in the size and spacing of the lower dowels to optimize construction.

A note (6) is added to allow for the construction joint shown between the floor and wall and the gap between the steel plate and the wall to vary because these elements may vary based on fabrication considerations and construction sequence.

Change Activity 6 – Design of Concrete on Steel Plate Floors and Floor to Wall Connection

Issue Description

The description of these floors, included in the last paragraph of UFSAR Subsection 3.8.4.4.1, refers to the design methodology for the finned floors described in UFSAR Subsection 3H.5.4. UFSAR Subsection 3H.5.4 describes the design methodology for bending in the floor. The description in the last paragraph of UFSAR Subsection 3.8.4.4.1 has an inappropriate and confusing reference to main control room ceiling and stiffeners. The preceding paragraph describes the finned floor above the main control room and reference to finned floors should not be included in the last paragraph. The concrete on steel plate floors without fins do not have stiffeners. The absence of fins in the floor design makes the design similar to, but not exactly the same as, the finned floors described in UFSAR Subsection 3H.5.4. The description of the floors does not specify the design requirements for the connection of the floor to the wall. The standard hooks shown in the wall in UFSAR Figure 3H.5-9, Sheet 2, show an orientation that may need to vary because of interferences and obstructions in the walls.

Proposed Change

Revise the existing last paragraph of UFSAR Subsection 3.8.4.4.1, to remove the reference to the main control room ceiling and stiffeners. Add text that the methodology is similar to that described in Subsection 3H.5.4.

Revise UFSAR Subsection 3.8.4.4.1, to add information about floor to wall design conformance with ACI 349 requirements for development length and non-contact reinforcement bar splices, ACI 349 Appendix B requirements for shear stud strength, and AISC N690 requirements for shear stud capacities. This change is applicable to selected floors at or near the 82′-6″ and 92′-6″ design elevation in the south end of the auxiliary building. This code applicability information applies to the floor to wall connection for both finned floors and concrete on steel plate floors without fins. Specifying the appropriate code provisions for development length and splice length that provide criteria used for the connection design will clarify the application of ACI 349 requirements. An evaluation was completed for the floor-to-wall connection to confirm that ACI code provisions are appropriate for developing capacity between the wall dowels and steel plate. The floor to wall connection design information added does not change the compliance of the concrete on steel plate floor design with codes and standards, including ACI 349 and AISC N690.

Revise UFSAR Subsection 3.8.4.4.1 to add information that the orientation of the standard hooks that provide development in the walls for the reinforcement dowels may vary and add reference to requirements for headed reinforcement. The connection configurations with hook orientations different than shown in UFSAR Figure 3H.5-9, Sheet 2, continue to meet ACI 349 code requirements.

Licensing Basis Change Descriptions

A. Not used.

B. Revise the existing last paragraph of UFSAR Subsection 3.8.4.4.1 as follows: (Change Activity 6)
   1. Remove reference to control room ceiling and stiffeners.
   2. Identify that the design methodology is similar to that described in Subsection 3H.5.4.

C. Add a new paragraph to UFSAR Subsection 3.8.4.4.1 to refer to requirements in ACI 349 for development length and splice length and requirements in ACI 349 and AISC N690 for shear stud strength and capacity. Add reference to ACI 318-11 requirements for headed reinforcement. These requirements apply to the floor to wall connection design. Add information that standard hook orientation may be different. (Change Activity 6)

D. Not used.

E. Not used.

F. Not used.

G. Not used.

H. Not used.

I. Not used.

J. Change to UFSAR Figure 3H.5-9, Sheet 1 (Change Activity 1):
   1. Not used.
   2. Not used.
   3. Add note to the figure to provide the following information:
      a. State that the section shown is a specific location and other locations will have variations in design details.

K. Revise UFSAR Figure 3H.5-9, Sheet 2, as follows: (Change Activities 1 and 5):
   1. Through 8. Not used.
   9. Add notes to the figure to provide the following information: These notes are applicable to CA20 floors at or near the 82′-6″ and 92′-6″ design elevation in the auxiliary building.

a. State that the section shown is a specific location and other locations will have variations in design details.
b. State that headed reinforcement may be used.
c. Identify the requirements for development of headed reinforcement.
d. Identify the code requirements for reinforcement size and spacing and provide the range of reinforcement size and spacing.
e. Identify the requirements for dowel length.
f. Allow for variation in use of construction joint, gap between steel plate and wall and use of mechanical couplers in lieu of mechanical splices based on fabrication and construction needs.
g. State that the reinforcement shown is for locations away from obstructions.
h. State that the elevation of the top of concrete is based on location and design requirements for the floors.

L. Revise UFSAR Figure 3H.5-9, Sheet 3, as follows: (Change Activity 1):
   1. Add note to the figure to provide the following information:
      a. State that the shear stud design shown is for locations away from obstructions.

3. Technical Evaluation

Structure, System, Component and/or Analysis Description

The nuclear island structures consist of the containment, shield building, and auxiliary building. The functions of the nuclear island structures are to provide support, protection, and separation for the seismic Category I mechanical and electrical equipment located in the nuclear island.

The nuclear island structures provide protection for the safety-related equipment against the consequences of either a postulated internal or external event. The nuclear island structures are designed to withstand the effects of natural phenomena such as hurricanes, floods, tornados, tsunamis, and earthquakes without loss of capability to perform safety functions. The nuclear island structures are designed to withstand the effects of postulated internal events such as fires and flooding without loss of capability to perform safety functions. Some floors provide radiation shielding.

The floors in the auxiliary building are seismic Category I structures and provide support and anchorage for component and piping supports and other attachments. The concrete on steel plate floor is designed as a reinforced concrete slab using the criteria and requirements of ACI 349. The steel plate provides the bottom layer reinforcement for the concrete slab. The steel plate is connected to the concrete with shear studs welded to the top of the plate. The steel plate supports the wet concrete prior to the concrete setting. The connection of the floor to the wall transfers the load from the concrete and steel plate in the floor to the wall with

reinforcement bar dowels located between shear studs attached to the steel plate with the dowels at an elevation below the top of the studs. The dowels are developed in the wall with a standard hook or headed reinforcement. The floor to wall connection design satisfies ACI 349 requirements for the length of the dowel, ACI 349 requirements for shear stud strength, and AISC N690 requirements for shear stud capacity. These connection design elements are part of the design of the floor to wall connection approved in the AP1000 design as represented in UFSAR Figure 3H.5-9, Sheet 2, and the methodology for the design remains unchanged.

Floors that are part of, and adjacent to, the CA20 module on the south end of the auxiliary building at or near the 82′-6″ and 92′-6″ design elevation are designed as concrete on steel plate floors. UFSAR Subsection 3.8.4.4.1 references the finned floor design methodology in UFSAR Subsection 3H.5.4 for the design methodology used for the concrete on steel plate floors. The steel plate provides the bottom layer reinforcement for the concrete slab. The steel plate is connected to the concrete with shear studs welded to the top of the plate. The steel plate supports the wet concrete prior to the concrete setting.

The design of headed reinforcement is consistent with the criteria for development of headed reinforcement which utilize ACI 318-11, Section 12.6 requirements and which have been previously incorporated into UFSAR Subsection 3.8.4.4.1.

Supporting Technical Details

Variation in floor reinforcement design is required because of differing geometry and loads at locations away from the critical section. In the localized areas adjacent to penetrations, openings, and other obstructions, the design of the reinforcement may vary to satisfy design requirements for the floor or the penetration. The design of the floors with the subject variances is in conformance with design and analysis requirements for the structures identified in the UFSAR, including ACI 349 and AISC N690.

Proposed changes are identified for the development of the reinforcement in the floor and for the detail design of the connection of the floor to the wall to be consistent with standard construction practice. These changes are included in the revised UFSAR Figure 3H.5-9, Sheet 2. A note (6) allows for “Mechanical Splices” to be replaced with “Mechanical Couplers,” and for the gap between the steel plate and wall and use of a construction joint to vary because these are related to fabrication details and construction sequence. These changes do not affect the strength of the floor or connections or the conformance with ACI 349 and AISC N690.

A note is added to allow for different lengths for the reinforcement bar dowels in UFSAR Figure 3H.5-9 because the ACI code requires different lengths based on the reinforcement size used for other sections. Also, the length of the dowels must be sufficient to incorporate sufficient shear studs to develop the capacity of the dowels and the demand in the bottom plate. The design of the connection satisfies the requirements in ACI 349, Appendix B, for strength of the shear studs, and AISC N690 for shear stud capacity. ACI 349, Appendix B includes

requirements for shear studs used as anchors in concrete. These requirements are used to determine the strength of the shear studs and the connection to the bottom plate to determine the number of shear studs required within the dowel length. Information is added in the notes on the figure about the ACI 349 and AISC N690 requirements for the length of the reinforcement dowels. These notes are applicable to selected floors at or near the 82′-6″ and 92′-6″ design elevation in the south end of the auxiliary building. Specifying additional details on the use of the code requirements for the connection design does not change the design basis of the connection as represented in existing UFSAR Figure 3H.5-9, Sheet 2. The dowel length dimension removed from the figure was determined using these requirements.

Removing the reference to control room ceiling and stiffeners in the existing last paragraph of UFSAR Subsection 3.8.4.4.1 clarifies to which type of floor design the paragraph applies. This change does not change the design and design requirements for the concrete on steel plate floor without fins because the design of these floors does not include reliance on stiffeners. The floors without fins are considered similar to the design methodology described in UFSAR Subsection 3H.5.4 because the finned floors are designed as reinforced concrete slabs, the steel plate provides the bottom layer reinforcement for the concrete slab, and the steel plate is connected to the concrete with shear studs welded to the top of the plate. The absence of fins changes the location of the neutral axis in negative bending and the reliance on compression in the plate which is a difference with the analysis details described in Subsection 3H.5.4. This change to the UFSAR does not change the design and design requirements for the finned floor because the preceding paragraph in UFSAR Subsection 3.8.4.4.1 describes the finned floor used in the control room ceiling and is not changed.

The addition of information about the connection design in UFSAR Subsection 3.8.4.4.1 clarifies the description of the design in the licensing basis for the floor to wall connections for selected concrete on steel plate floors by adding specific design requirements. These specific design requirements do not change the floor to wall connection design represented in UFSAR Figure 3H.5-9 for finned floors. The design of the floor and floor to wall connections satisfies the requirements of ACI 349 Sections 12.2, 12.15, and 21.5.4 for development length and required splice length. Because the dowels are located between rows of studs spaced 10 inches apart for the concrete on steel plate floors and no higher than the height of the top of the studs above the plate, the ACI 349 requirement for a maximum clear distance of 6 inches between the dowels and shear studs is always satisfied. The design of the connections satisfies the requirements in ACI 349, Appendix B, for strength of the shear studs, and AISC N690 for shear stud capacity. The information added does not change the compliance of the concrete on steel plate floor design with codes and standards, including ACI 349 and AISC N690.

Revise UFSAR Subsection 3.8.4.4.1 to add information that the orientation of the standard hooks that provide development in the walls for the reinforcement dowels may vary and add reference to requirements for headed reinforcement. Floors that are connected to walls in the CA20 module on the south end of the auxiliary building use dowels developed in the wall with a

standard hook or may use headed reinforcement. The standard hook details may differ from UFSAR Figure 3H.5-9, Sheet 2, because of potential interferences of the hook extension at the free end of the bar with shear studs, wall truss components, overlay plate anchorage, embedments, and other items within the wall. In certain cases, the hook extensions may not be oriented toward each other. The connection configurations with hook orientations different than shown in UFSAR Figure 3H.5-9, Sheet 2, continue to satisfy ACI 349 code requirements. The provisions included in later editions of ACI 349 to place the hooks in an opposed orientation do not apply to the subject floor to wall connection. The variation in hook orientation is acceptable in module walls because increased concrete stress due to hook orientation with both hook extensions oriented downward, upward, or away from each other is resisted by the truss structure that provides structural integrity to the module walls. Because the module faceplates are welded to the truss structure, they provide additional confinement to the concrete and contribute to supporting the increased concrete stress. In addition, the CA20 floors at or near the 82′-6″ and 92′-6″ design elevation in the south end of the auxiliary building do not see a significant load reversal under seismic demand because the upward acting forces do not overcome deadweight.

Identifying code requirements for development length and splice length that apply to the connection design will clarify the application of ACI 349 requirements. The information added does not change the compliance of the floor design for the selected floors including the connection design with codes and standards, including ACI 349 and AISC N690. The connection design between the floor and wall provides load transfer between reinforcement bar dowels attached to the walls and shear studs attached to the steel plate on the bottom of the floor. The floor to wall connection design is represented in UFSAR Figure 3H.5-9, Sheet 2, and was part of the design approved in the AP1000 design certification. The ACI 349 and AISC N690 requirements for the length of the reinforcement bar dowel, shear stud strength, and shear stud capacity are the design basis for the design represented in UFSAR Figure 3H.5-9. The reference to requirements for headed reinforcement in ACI 318 is consistent with the requirements for headed reinforcement in other portions of the auxiliary building.

The AP1000 DCD and the associated Final Safety Evaluation Report (FSER), NUREG-1793, do not specifically discuss the floor to wall connection design represented in UFSAR Figure 3H.5-9, Sheet 2. A supplemental evaluation documents the technical basis for the connection using reinforcement dowels and a matrix of shear studs. This supplemental evaluation includes detailed consideration of the connection and shows that at any location along the connection either the plate or the dowel can carry the tensile force transferred. The transfer of shear is also evaluated.

In this supplemental evaluation, the connection is considered to be divided into regions over the length of the reinforcing bar dowel. In the region adjacent to the wall, the reinforcing bar dowel is fully developed at both ends. The reinforcing bar dowels are sized based on the tension demand in the bottom plate from out-of-plane flexure and membrane tension. The reinforcing

bar dowel development length within the module floor is at a minimum the Class B lap splice length in accordance with ACI 349. The reinforcing bar dowels are within the height of the shear studs connected to the module floor bottom plate. In the second region the bottom dowel transitions from fully developed to the end of the dowel away from the wall over a length determined by the ACI 349 requirements for development length. In this second region, the bottom plate is developed adequately to carry floor module demand in accordance with ACI 349 and AISC N690 requirements. The bottom plate is anchored to the concrete with the shear studs in the region adjacent to the wall. The stud spacing is determined based on AISC N690 requirements for developing composite action. The thickness of the bottom plate is designed to be sufficient for the construction loads (e.g., wet concrete) and the tension demand due to composite action under the applicable load combinations. The change in the spacing of the lower dowels is not required by the supplemental evaluation. The change is to optimize construction.

The design criteria for the evaluation are those included in ACI 349 and AISC N690 as they apply to the different elements that are part of the connection. The results confirm that the design requirements used for the connection design represented in UFSAR Figure 3H.5-9 for this wall-to-floor connection are appropriate and meet the plant design basis.

The changes to the UFSAR for the floor to wall connection design do not impact the moment of inertia or stiffness of the connection of the floor to the wall. There is no change in the mass of the subject floor sections. Therefore, there is no change to the seismic model and seismic analysis as a result of these changes. The floor to wall connection is considered to be a fully fixed connection. This is not changed in the seismic model for the proposed changes.

The response of the structure to seismic motions is not altered by the changes in the design details of the subject auxiliary building floors. The stiffness of the floor, the stiffness of the floor to wall connections, and the mass of the floor are not altered from that considered in the seismic analysis finite element model of the floor. The seismic analysis of the auxiliary building is not impacted by these design changes.

The proposed changes to the detail design of auxiliary building floors at or near the 82′-6″ and 92′-6″ design elevation do not change the function, design, or operation of the systems and components supported by and located under the floors in the auxiliary building. The proposed changes do not change the function, design, or operation of the containment vessel and passive containment cooling system. The thickness and strength of the auxiliary building floors and roof are not reduced. The proposed changes do not affect the prevention and mitigation of abnormal events, e.g., accidents, anticipated operational occurrences, earthquakes, floods and turbine missiles, or their safety or design analyses. The proposed changes do not involve, nor interface with, any structure, system or component accident initiator or initiating sequence of events, and thus, the probabilities of the accidents evaluated in the UFSAR are not affected.

The detail design changes to floors at or near the 82′-6″ and 92′-6″ design elevation in the auxiliary building do not interface with or affect safety-related equipment or a fission product barrier. No system or design function or equipment qualification would be adversely affected by the proposed changes. The changes do not result in a new failure mode, malfunction or sequence of events that could adversely affect a radioactive material barrier or safety-related equipment. The proposed changes do 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 significant fuel cladding failures.

The proposed changes do not adversely affect any safety-related system or component, equipment, design code, design code allowable value, function or design analysis, nor do they adversely affect any safety analysis input or result, or design/safety margin.

The proposed activity has no adverse effect on the ex-vessel severe accident. The design, geometry, and strength of the containment internal structures are not changed. The design and material selection of the concrete floor beneath the reactor vessel are not altered. The response of the containment to a postulated reactor vessel failure, including direct containment heating, ex-vessel steam explosions, and core concrete interactions is not altered by the changes to the detail design of floors in the auxiliary building. The design of the reactor vessel and the response of the reactor vessel to a postulated severe accident are not altered by the changes to the detail design of floors in the auxiliary building.

The proposed activity has no impact on the Aircraft Impact Assessment. The changes described to the floors are internal to the structures and do not impact the design or response of the containment vessel and shield building. There is no change to protection of plant structures, systems, and components against aircraft impact provided by the design of the shield building. There is no change to the design of any of the key design features described in UFSAR Appendix 19F. The activity described does not change the overall design or construction of the shield building.

The proposed changes associated with this license amendment request include changes in the detail design of module CA20 floors at the 82′-6″ and 92′-6″ design elevation in the auxiliary building. The changes are internal to the structures and the configuration, thickness, and density of the structures are not changed. The proposed changes do not affect the radiological source terms (i.e., amounts and types of radioactive materials released, their release rates and release durations) used in the accident analyses, thus, the consequences of accidents are not affected. These changes do not affect the containment, control, channeling, monitoring, processing or releasing of radioactive and non-radioactive materials. The location and design of penetrations through exterior walls and the permeability of the concrete structures is not changed. No effluent release path is affected. The types and quantities of expected effluents are not changed. The functionality of the design and operational features that are credited with

controlling the release of effluents during plant operation is not diminished. Therefore, neither radioactive nor non-radioactive material effluents are affected.

The thickness of the floors and the density of the concrete are not changed; therefore, there is no adverse change to the shielding provided by the floors. There is no change to plant systems or the response of systems to postulated accident conditions. There is no change to the predicted radioactive releases due to normal operation or postulated accident conditions. Plant radiation zones, controls under 10 CFR Part 20, and expected amounts and types of radiologically controlled materials are not affected by the proposed changes. Therefore, individual and cumulative radiation exposures do not change.

The change activity has no impact on the emergency plans or the physical security evaluation since there are no changes to the external configuration of the roof, walls, doors, or access to the Nuclear Island.

4. Regulatory Evaluation

4.1 Applicable Regulatory Requirements/Criteria

10 CFR Part 50, Appendix A, General Design Criterion (GDC) 1 requires that structures be designed, fabricated, erected, constructed, tested, and inspected to quality standards commensurate with the importance of the safety functions to be performed. The proposed changes do not change the criteria used for the design, analysis, and construction of the floors in the auxiliary building. The design of the portions of the auxiliary building affected by this activity remains in conformance with the code requirements identified in the UFSAR.

10 CFR Part 50, Appendix A, GDC 2 states that structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami, and seiches without loss of capability to perform their safety functions. The structures affected by this activity maintain compliance with GDC 2. The thickness, geometry, and strength of the structures are not adversely changed. The response of the structure to seismic motions is not significantly altered by the changes in the design details of the floors.

10 CFR Part 50, Appendix A, GDC 4 states that structures, systems, and components important to safety shall 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 structures affected by this activity maintain compliance with GDC 4. The thickness, geometry, and strength of the structures are not adversely changed. The response of the structure to the effects of extreme winds and external missiles is not altered by the

change in the design details of the structure. The response of the structure to the effects of seismic ground motion is not significantly altered by the change in the design details of the structure.

10 CFR Part 52, Appendix D, Section VIII.B.6 and VIII.B.5a require prior NRC approval for Tier 2* information departures and for Tier 2 information departures that involve changes to Tier 2* information respectively. Although this departure does not adversely affect safety, it does involve departures from Tier 2* and related Tier 2 information. Therefore, NRC approval is required prior to implementing the Tier 2* and associated Tier 2 departures addressed in this departure.

4.2 Precedent

No precedent is identified.

4.3 Significant Hazards Consideration

The proposed amendment would revise the plant-specific design control document (DCD) Tier 2* and associated Tier 2 material incorporated into the Updated Final Safety Analysis Report (UFSAR) to incorporate changes to UFSAR descriptions which are proposed to address changes in the design of floors in the auxiliary building.

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 design functions of the auxiliary building floors are to provide support, protection, and separation for the seismic Category I mechanical and electrical equipment located in the auxiliary building. The auxiliary building is a seismic Category I structure and is designed for dead, live, thermal, pressure, safe shutdown earthquake loads, and loads due to postulated pipe breaks. The proposed changes to UFSAR descriptions are intended to address changes in the detail design of floors in the auxiliary building. The thickness and strength of the auxiliary building floors are not reduced. As a result, the design function of the auxiliary building structure is not adversely affected by the proposed changes. There is no change to plant systems or the response of systems to postulated accident conditions. There is no change to the predicted radioactive releases due to postulated accident conditions. The plant response to previously evaluated accidents or external

events is not adversely affected, nor do the changes described create any new accident precursors. 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 changes to UFSAR descriptions are proposed to address changes in the detail design of floors in the auxiliary building. The thickness, geometry, and strength of the structures are not adversely altered. The concrete and reinforcement materials are not altered. The properties of the concrete are not altered. The changes to the design details of the auxiliary building structure do not create any new accident precursors. As a result, the design function of the auxiliary building structure is not adversely affected by the proposed changes. 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 criteria and requirements of American Concrete Institute (ACI) 349 and American Institute of Steel Construction (AISC) N690 provide a margin of safety to structural failure. The design of the auxiliary building structure conforms to criteria and requirements in ACI 349 and AISC N690 and therefore maintains the margin of safety. Analysis of the connection design confirms that code provisions are appropriate to the floor to wall connection. The proposed changes to the UFSAR address changes in the detail design of floors in the auxiliary building. The proposed changes also incorporate the requirements for development and anchoring of headed reinforcement which were previously approved. There is no change to design requirements of the auxiliary building structure. There is no change to the method of evaluation from that used in the design basis calculations. There is not a significant change to the in structure response spectra. Therefore, the proposed amendment does not result in 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

In conclusion, 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.

5. Environmental Considerations

The proposed amendment departs from Tier 2* and associated Tier 2 material in the UFSAR (Section 3.8 and Appendix 3H) related to the structural detail design of the floors for the auxiliary building. The proposed amendment includes changes to allow variances in the detail design of the reinforcement in floor sections in locations other than the critical section. The proposed amendment includes changes in the detail design of the connection of selected floor sections to adjacent walls. The proposed amendment clarifies the floor to wall connection design for concrete on steel plate floors in the auxiliary building.

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR Part 20, or would change an inspection or surveillance requirement. However, facility construction and operation following implementation of the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or a 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 amendment meets 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 proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated; (2) the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated; and (3) the proposed

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

(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 amendment involves structural design changes which do not change the as-built configuration of the plant systems and thus do not introduce any changes to effluent types (e.g., effluents containing chemicals or biocides, sanitary system effluents, and other effluents) or affect any plant radiological or non-radiological effluent release quantities. Furthermore, these changes do not diminish the functionality of any design or operational features that are credited with controlling the release of effluents during plant operation. Therefore, it is concluded that the proposed 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 amendment involves structural detail design changes to floors without impacting the radiation protection evaluation, and thus, do not affect any plant structure, system or component, their function, plant effluent, or radiation controls. This proposed amendment does not change the as-built configuration of the plant systems. Consequently, these changes have no effect on individual or cumulative occupational radiation exposure during plant operation. Therefore, it is concluded that the proposed amendment does not involve a significant increase in individual or cumulative occupational radiation exposure.

Based on the above review of the proposed amendment, it has been determined that anticipated construction and operational impacts of the proposed 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 the individual or cumulative occupational radiation exposure. Accordingly, the proposed 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), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

Southern Nuclear Operating Company

Vogtle Electric Generating Plant (VEGP) Units 3 and 4

ND-16-1024

Enclosure 4

Proposed Changes to Licensing Basis Documents

(LAR-16-009R1)

(This Enclosure consists of 5 pages, including this cover page)

UFSAR Subsection 3.8.4.4.1, Seismic Category I Structures – Revise to include additional information for the last paragraph as shown below.

The concrete floors on steel plates, including the ~~control room ceiling and the~~ floors in the CA20 module, are designed as reinforced concrete slabs in accordance with ACI-349. The steel panels are designed and constructed in accordance with AISC-N690. For positive bending, the steel plate is in tension and the steel plate ~~and stiffeners~~ serves as the bottom reinforcement. For negative bending, compression is resisted by the concrete and ~~stiffened~~ steel plate and the tension by top reinforcement in the concrete. This methodology is similar to that described for the control room ceiling in Subsection 3H.5.4.

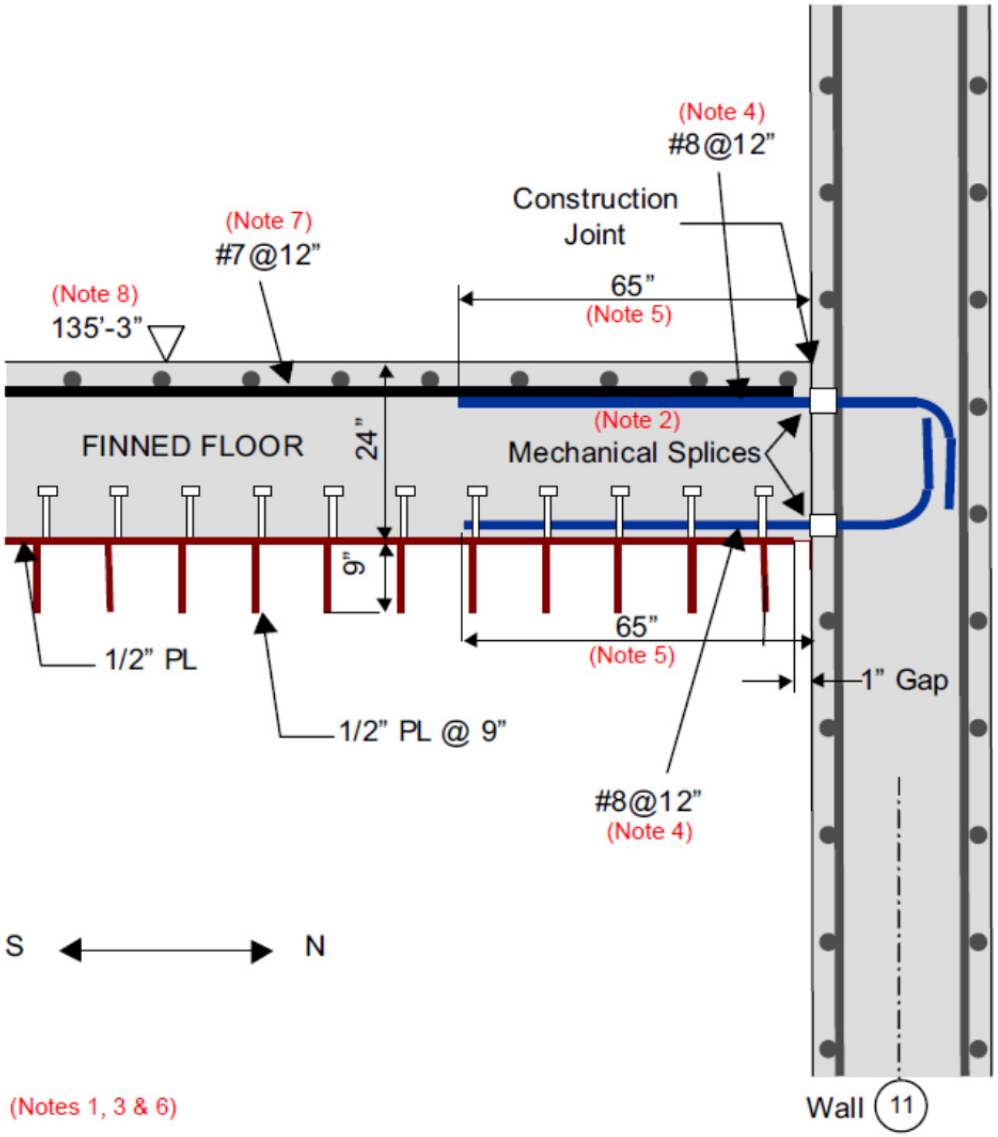
The information in this paragraph is specific to the CA20 connection of the floor to the wall for the concrete on steel plate floors at El. 82'-6" and El. 92'-6". The connection of the floor to the wall for the concrete on steel plate floors satisfies ACI 349 requirements in Sections 12.2, 12.15, and 21.5.4 for the development length and non-contact reinforcement bar splices. The design of the connection satisfies ACI 349, Appendix B, requirements for shear stud strength and AISC N690 requirements for shear stud capacity. The anchorage of the reinforcing dowels may vary from that shown in UFSAR Figure 3H.5-9, Sheet 2. Differences in dowel anchorage details continue to satisfy ACI 349 requirement for standard hooks and ACI 318-11 requirements for headed reinforcement.

UFSAR Figure 3H.5-9 (Sheet 1 of 3), Auxiliary Building Finned Floor – Revise the information to add the Note shown below.

NOTE APPLICABLE TO CA20 MODULE FLOORS AT EL. 82’-6” and EL. 92’-6”:

1. DETAIL SHOWN IS SPECIFIC TO THE REINFORCED CONCRETE FLOOR AT EL. 135'-3" (MAIN CONTROL ROOM CEILING). REFER TO THIS AND OTHER NOTES FOR ADDITIONAL INFORMATION ABOUT DESIGN DETAILS FOR OTHER FLOOR SECTIONS AND FOR CONNECTIONS TO WALLS OTHER THAN THE WALL ALONG COLUMN LINE 11.

UFSAR Figure 3H.5-9 (Sheet 2 of 3), Auxiliary Building Finned Floor – Revise the information to add the Notes shown below.



UFSAR Figure 3H.5-9 (Sheet 2 of 3), Auxiliary Building Finned Floor – Revise the information to add the Notes shown below.

NOTES APPLICABLE TO CA20 MODULE FLOORS AT EL. 82’-6” and EL. 92’-6”:

1. DETAIL SHOWN IS SPECIFIC TO THE REINFORCED CONCRETE FLOOR AT EL. 135'-3" (MAIN CONTROL ROOM CEILING). REFER TO THIS AND OTHER NOTES FOR ADDITIONAL INFORMATION ABOUT DESIGN DETAILS FOR OTHER FLOOR SECTIONS AND FOR CONNECTIONS TO WALLS OTHER THAN THE WALL ALONG COLUMN LINE 11.

2. THE DEVELOPMENT OF THE FLOOR REINFORCEMENT IN THE WALLS CAN BE HEADED REINFORCEMENT INSTEAD OF STANDARD HOOKS.

3. REFER TO SUBSECTION 3.8.4.4.1 FOR THE REQUIREMENTS FOR DEVELOPMENT OF HEADED REINFORCEMENT.

4. REINFORCEMENT SIZE AND SPACING FOR CONNECTING DOWELS ARE BASED ON THE REQUIREMENTS IN ACI 349 AND ACI 318-11, SECTION 12.6. THE RANGE OF SPACING AND SIZE OF THE CONNECTING DOWELS VARIES FROM 6" TO 12" AND FROM #8 TO #11, RESPECTIVELY.

5. SPLICE LENGTH IS THE LONGEST OF A) ACI 349 REQUIREMENTS FOR SPLICE LENGTH, B) LENGTH TO INCORPORATE SUFFICIENT SHEAR STUDS TO DEVELOP THE CAPACITY OF THE DOWEL, PER AISC N690 SHEAR STUD CAPACITIES, OR C) LENGTH TO INCORPORATE SUFFICIENT SHEAR STUDS TO DEVELOP THE DEMAND IN THE BOTTOM PLATE, PER AISC N690 SHEAR STUD CAPACITIES.

6. THE GAP BETWEEN STEEL PLATE AND WALL, USE OF CONSTRUCTION JOINTS, AND USE OF MECHANICAL COUPLERS IN LIEU OF MECHANICAL SPLICES VARIES BASED ON FABRICATION AND CONSTRUCTION NEEDS.

7. THE REINFORCEMENT SHOWN IS FOR LOCATIONS AWAY FROM OPENINGS, PENETRATIONS, EMBEDMENTS, AND OTHER OBSTRUCTIONS. THE RANGE OF REINFORCEMENT SIZE AND SPACING VARIES FROM #8 TO #11 AND FROM 6" TO 12", RESPECTIVELY.

8. THE ELEVATION OF THE TOP OF CONCRETE IS BASED ON LOCATION AND DESIGN REQUIREMENTS FOR THE FLOORS.

UFSAR Figure 3H.5-9 (Sheet 3 of 3), Auxiliary Building Finned Floor – Revise the information to add Note as shown below.

NOTE APPLICABLE TO CA20 MODULE FLOORS
AT EL. 82'-6" and EL. 92'-6":

1. THE SHEAR STUD DESIGN SHOWN IS FOR LOCATIONS AWAY FROM OPENINGS, PENETRATIONS, EMBEDMENTS, AND OTHER OBSTRUCTIONS.