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SOUTHERN COMPANY
Energy to Serve Your World℠

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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Joseph M. Farley Nuclear Plant Units 1 and 2
Application for License Renewal –
February 13, 2004 Requests for Additional Information

Ladies and Gentlemen:

This letter is in response to your letter dated February 13, 2004 requesting additional information for the review of the Joseph M. Farley Nuclear Plant, Units 1 and 2, License Renewal Application. These responses are provided in Enclosure 1.

Mr. L. M. Stinson states he is a vice president of Southern Nuclear Operating Company, 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.

If you have any questions, please contact Charles Pierce at 205-992-7872.

Respectfully submitted,

SOUTHERN NUCLEAR OPERATING COMPANY

L. M. Stinson
Vice President, Farley

Sworn to and subscribed before me this 12th *day of* March, *2004.*

Gloria W. Bui
Notary Public

My commission expires: 6-7-05

LMS/GMC/slb

A099

Enclosure: Responses to February 13, 2004 Requests for Additional Information, Joseph M. Farley Nuclear Plant, Units 1 and 2

cc: Southern Nuclear Operating Company
Mr. J. B. Beasley Jr., Executive Vice President
Mr. D. E. Grissette, General Manager – Plant Farley
Document Services RTYPE: CFA04.054; LC# 13977

U. S. Nuclear Regulatory Commission
Ms. T. Y. Liu, License Renewal Project Manager
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Alabama Department of Public Health
Dr. D. E. Williamson, State Health Officer

Joseph M. Farley Nuclear Plant Units 1 and 2

Application for License Renewal

Responses to February 13, 2004 Requests for Additional Information

RAI 2.3.1.1-3

Borated water leakage through the pressure boundary in PWRs, and resulting borated water induced wastage of carbon steel is a potential aging degradation for the components. Reactor vessel head lifting lugs are considered to be such components requiring aging management. However, if the components are currently covered under Boric Acid Wastage Surveillance Program, then it may not require additional aging management. It appears that the subject components were not discussed in the LRA (Table 2.3.1.1), and therefore, the staff requests the applicant to verify whether the components are within the surveillance program; and if not, to provide an explanation for the exclusion.

Response:

The reactor vessel closure head alloy steel lifting lugs are integral to the head and included within the LRA Table 2.3.1.1 component group "Closure Head Dome and Flange" and are within the scope of the FNP Borated Water Leakage Assessment and Evaluation Program.

RAI 2.3.1.2-1

Please verify whether the component group "Neutron Panels" listed in LRA Table 2.3.1.2 includes a thermal shield, whose intended function is to provide shielding for the safety-related SSCs, such as the reactor vessel and the internals, from gammas and neutrons. A thermal shield may be relied upon to minimize irradiation induced embrittlement of the vessel and/or the internals. If the component exists at Farley, clarify whether a thermal shield is included with "Neutron Panels" or justify its exclusion from aging management; otherwise, submit an AMR for the subject component.

Response

FNP uses a neutron panel shielding design instead of a 360° circumferential thermal shield design.

The FNP LRA Table 2.3.1.2 component group "Neutron Panels" represents several neutron panels strategically located at high fluence azimuths to reduce the fluence exposure of the FNP Reactor Vessel beltline materials. These neutron panels are fastened to the exterior of the core barrel and are provided in lieu of a thermal shield.

The term "thermal shield" has been typically used to describe a design that utilizes a 360° circumferential shield to reduce neutron fluence on the Reactor Vessel beltline materials.

RAI 2.3.1.3-1

Please verify whether the component groups "Piping, Class 1 (Reactor Coolant Loop)," "Piping, Class 1 (Piping Components < NPS 4)," and "Piping, Class 1 (Piping Components ≥ NPS 4)" listed in LRA Table 2.3.1.3 also include fittings, which serve as a pressure boundary. In accordance with 10 CFR 54.4(a)(2), the fittings should be within the scope of license renewal. Please provide justification for the exclusion or submit an AMR for the stated components.

Response:

SNC confirms that pipe fittings are included within the component groups "Piping, Class 1 (Reactor Coolant Loop)," "Piping, Class 1 (Piping Components < NPS 4)," and "Piping, Class 1 (Piping Components ≥ NPS 4)." SNC defined component groups with the guidance of NEI 95-10, Revision 3. Appendix B of this industry guideline identifies typical components and commodity groupings for use in an integrated plant assessment. Item 26 of this appendix covers the category Reactor Coolant Pressure Boundary Components and the component or commodity group "ASME Class I Piping." This item is understood to include pipe fittings.

RAI 2.4-1

LRA Table 2.2-1h identifies structures that are not in scope of license renewal. It is not obvious to the staff that all of the listed structures serve no intended function. The applicant is requested to provide its technical basis for this determination for the following structures: circulating water structures and cooling towers; containment equipment hatch access enclosure; river water intake structure; meteorological & microwave structures and equipment; and yard drainage system. Also verify that seismic II/I considerations are not applicable to any of the structures not in the scope of license renewal (e.g., containment equipment hatch access enclosure).

In addition, while the staff acknowledges that the tendon access gallery does not serve an intended function in the strictest interpretation of the License Renewal Rule, there is significant industry operating experience related to flooding and corrosive environments in the tendon access gallery that have contributed to degradation of the tendon anchorage components and surrounding concrete. Management of the condition of the tendon access gallery is a preventive step to minimize aging effects for the prestressing system. The applicant is requested to submit its plant-specific operating/aging experience related to (1) flooding and corrosive environments in the tendon access gallery, and (2) degradation of the prestressing system components (both steel and concrete) in the tendon access gallery, and based on the FNP specific tendon gallery operating/aging experience, discuss FNP's basis for not including the tendon gallery structure within the AMR scope pursuant to 10 CFR 54.4(a)(2).

Response

SNC has verified for the structures listed in Table 2.2-1h "*Systems and Structures Not Within the Scope of License Renewal - Structures*," that seismic II/I considerations are not applicable.

The Staff requested the technical basis for determining the following structures are not in the scope of license renewal: circulating water structures and cooling towers; containment equipment hatch access enclosure; river water intake structure; meteorological & microwave structures and equipment; and yard drainage system. These structures do not house equipment relied upon in the licensing basis to perform safe shutdown, mitigate accidents, or address any of the regulated events in the scope of the rule. The structures cannot fail in a way that adversely affects a safety related function or the performance of safety related equipment. Therefore, these structures do not satisfy the criteria as defined in 10 CFR 54.4 (a) (1) - (3) and are not within the scope of license renewal. Specific discussion of each structure follows.

Circulating Water Structures and Cooling Towers: The circulating water systems and structures, including the cooling towers, provide cooling water to the tube-side of the main condensers for removal of waste heat from the power cycle (including maintaining condenser vacuum in support of efficient turbine operation). During a normal plant shutdown heat is rejected to the main condenser via the non safety-related main steam dump valves, however this method is not credited for safe shutdown. The main steam safety valves and main steam atmospheric relief valves, which discharge directly to the atmosphere, provide the safety-related means for decay heat removal to maintain hot shutdown. The circulating water structures include the concrete

basins under the cooling towers, concrete canals and tunnels that direct the water flow to and from the condensers, and the circulating water pump structures. The cooling towers are not located near any safety-related SSCs, and the circulating water structures cannot fail in any way that could interact with a safety related structure.

Containment Equipment Hatch Access Enclosure: This non safety-related enclosure is a free-standing sheet metal and steel frame structure that provides shelter over the equipment hatch access area from inclement weather during outage activities. The enclosure is open on two sides to provide free access to the Containment Equipment Hatch. The structure is of lightweight construction such that failure of the structure (e.g., during a seismic event) will not impair the ability of the containment structure (including equipment hatch) from performing its intended function.

River Water Intake Structure: Loss of the River Water Intake Structure is discussed in UFSAR Section 9.2.1.2.3.1 which states "The station cooling water system is designed such that safe shutdown of the plant is not dependent on the river water system as a cooling water source" and "The storage pond alone serves as the ultimate heat sink for the plant." The River Water Intake Structure is located remote from the plant's safety-related structures (over 2000 feet from the Auxiliary Buildings and from the pond) and houses the river water pumps and related equipment, none of which are required for safe shutdown (including in the event of a fire) or to mitigate any accident. The portions of the River Water System within the scope of License Renewal (i.e., the Service Water pond level instruments) described in LRA Section 2.3.3.5 are located at the pond and not at or in proximity of the River Water Intake Structure.

Meteorological & Microwave Structures: Instruments for measuring meteorological parameters are installed on a main and a backup tower located in a cleared area north of the plant site. Microwave communication equipment is also installed on these towers. The towers and equipment are non safety-related and do not pose any spatial interaction hazard to safety-related SSCs based on the remote location. In addition, the intended functions of these SSCs do not meet the 10 CFR 54.4(a) criteria for safety-related or regulated events. Some of the meteorological data is utilized for post-accident release assessment (R.G. 1.97 Category 3 variable) but is not safety-related (it does not mitigate, only assesses the consequences of an accident). The microwave communication is connected to the intraplant telephone switchboard to enable plant personnel to have dial service to other Alabama Power Company locations. The meteorological and microwave communication systems are not required in the licensing basis to safely shutdown the plant or mitigate an accident.

Yard Drainage System: The yard drainage system is a combined system of culverts and open ditches that direct water (from rainfall) to natural drainage channels. The power block area, which is located on a small plateau, utilizes the elevation difference and resultant topography to direct rainfall runoff away from the facility. The yard drainage system assists in directing the rainfall runoff however the probable maximum precipitation (PMP) evaluation assumed all of the buried storm drainage system was inoperative and the PMP runoff was carried off on the ground (refer to FSAR section 2.4.10). The PMP evaluation demonstrated no flooding of a doorway or opening of a safety-related building would occur from the runoff, and therefore an operating storm drainage system is an added safeguard but is not relied upon in the licensing basis for FNP.

Tendon Access Gallery

The requested FNP plant-specific operating/aging experience related to the tendon access gallery is stated below:

(1) Flooding and Corrosive Environments in the Tendon Access Gallery:

FNP experience has identified groundwater intrusion into the Containment Tendon Access Gallery. The groundwater intrusion is through construction joints between the non-safety related tendon access gallery wall and the containment foundation. A sump pump system is located in the Tendon Access Gallery to pump out the water from the gallery. A few inches of water accumulation has been identified at some areas in the gallery during inspections.

In summary, the FNP tendon access gallery is a high humidity environment with water accumulation controlled by the installed sump pump system.

(2) Degradation of Prestressing Components:

No noticeable degradation of the prestressing system components (both steel and concrete) in the tendon access gallery has been observed. The prestressing system steel components that are exposed (not in the concrete) to the tendon access gallery environment are protected by canned enclosures filled with grease. The condition of these "cans" is checked as part of the containment inspections.

Some minor concrete leaching has been observed in the containment access gallery. Leaching has been identified (along with groundwater intrusion) at the interface joint between the gallery and the bottom of the containment foundation. The leaching material from the interface joint is considered insignificant in causing any deterioration (the groundwater at FNP is non-aggressive) and therefore does not result in any loss of function.

The FNP basis for not including the Tendon Gallery structure within the AMR scope pursuant to 10 CFR 54.4(a)(2) is as follows:

SNC agrees with the following excerpt from NUREG-1800, which asserts that the tendon access gallery does not perform an intended function, and that containment inspections (i.e., IWL inspections) *"provide reasonable assurance that the aging effects of the*

tendon anchorages, including those in the gallery, will continue to perform their intended functions":

> *The intended function of the post-tensioning system is to impose compressive forces on the concrete containment structure to resist the internal pressure resulting from a DBA with no loss of structural integrity. Although the tendon gallery is not relied on to maintain containment integrity during DBEs, operating experience indicates that water infiltration and high humidity in the tendon gallery can contribute to a significant aging effect on the vertical tendon anchorages that could potentially result in loss of the ability of the post-tensioning system to perform its intended function. However, containment inspections provide reasonable assurance that the aging effects of the tendon anchorages, including those in the gallery, will continue to perform their intended functions. Because the tendon gallery itself does not perform an intended function, it is not within the scope of license renewal.*

Due to conditions which exist in the Tendon Access Gallery, this area has been identified for inspections during future outages to ensure that the gallery does not degrade to an unacceptable structural condition. However, these inspections are not credited for License Renewal.

RAI 2.4-2

Based on its review of LRA Sections 2.1, 2.2, 2.3, 2.4, and 2.5, the staff identified a number of cross-references between the mechanical and structural scoping and screening, that require clarification and/or additional information:

In LRA Section 2.4.2.7, the plant vent stacks are identified as "yard structures". However, in the first paragraph, it is stated "The plant vent stacks are evaluated as part of the Auxiliary and Radwaste Ventilation System in Section 2.3.3.10." In LRA Section 2.4.2.7, under the heading "Plant Vent Stack", it states "The vent stack is a Seismic Category I structure that is not required for safe shutdown." and "The vent stack is a non safety-related structure but its function is to maintain its structural integrity during a design basis event such that it does not impact other SR structures or components." It appears that the plant vent stacks are in the LR scope for seismic II/I considerations. LRA Table 2.3.3.10 does not list the plant vent stacks as a "Component Type". Please clarify which section of LRA Chapter 2 includes the plant vent stacks (and their foundations) in its scope, and also identify where the AMR for the plant vent stacks (and their foundations) is explicitly listed in LRA Chapter 3.5 tables.

Response

The plant vent stacks are in LR scope as meeting the criteria identified in 10 CFR 54.4(a)(2).

The last sentence of the first paragraph of Section 2.4.2.7, "Yard Structures", which is quoted in the RAI, should have read (changes indicated in bold italics):

> "The plant vent stacks' ***noble gas radiation monitors*** are evaluated as part of the Auxiliary and Radwaste Ventilation System in Section 2.3.3.10."

The vent stack structural elements are addressed in LRA Sections 2.4.2 and 3.5 as discussed below.

Each unit's plant vent stack is a steel tubular structure used as a gaseous release point for various process, filtration and ventilation systems. Each plant vent stack is anchored at it's base to the Auxiliary Building's ground level (155' elev.) floor slab, and laterally restrained where it exits the Auxiliary Building roof. Lateral restraints provided between the top of the stack and the roof are mounted to the containment structure.

Supporting steel for the vent stack is addressed in the Yard Structures evaluation in the component type "Steel components: All Structural Steel" in Tables 2.4.2.7 and 3.5.2-8. The vent stack *foundation* is addressed in the Auxiliary Building evaluation in the component type "Concrete: Interior" listed in Tables 2.4.2.1 and 3.5.2-2.

The tubular steel portion of the vent stack is not specifically addressed in the LRA tables but is shown in the Structural Monitoring Program scope for license renewal as detailed in LRA Section B.4.3.5. Table 2.4.2.7, "Yard Structures Component Types Subject to Aging Management Review and their Intended Functions," should have included the following line item:

Component Type	Intended Function
Steel Vent Stack	**NSR Structural Support**

Correspondingly, the aging management review summary for Yard Structures in LRA Table 3.5.2-8 should have included the following entry:

Component Type *GALL Reference*	Intended Function	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Steel Vent Stack	NSR Structural Support	Carbon Steel	Outside	Loss of Material	Structural Monitoring Program	III.B5.1-a	3.5.1-29	C

RAI 2.4-3

Clarify the complete scope of load handling systems in the Farley LR scope. LRA Section 2.3.3.4 "Overhead Heavy and Refueling Load Handling System" appears to be limited to the major heavy lift and refueling-related systems. Are there any other load handling systems that serve an intended function (e.g., seismic II/I), and are included in the LR scope? If so, please provide a description of the other load handling systems in the LR scope; define their intended functions; identify whether they are in the Mechanical Systems scope or Structures scope; and specify where the AMR is located in the LRA.

Response

Section 2.3.3.4 "Overhead Heavy and Refueling Load Handling System" is limited to the major heavy lift and the refueling-related load handling systems. Included in the scope of license renewal for this LRA system are the containment polar cranes, reactor cavity manipulator cranes, spent fuel bridge cranes, and the spent fuel cask crane. The new fuel load handling systems are non safety-related and not in scope. Based on the observations made during field walkdowns, failure of the new fuel load handling systems could not prevent satisfactory accomplishment of any safety related function (spatial interaction). Therefore, the new fuel load handling systems were not brought into the scope of license renewal as part of the evaluation for the "Overhead Heavy and Refueling Load Handling System".

All load handling systems (e.g., monorails, jib crane, new fuel load handling systems) used in Category I structures were put in scope as part of the scoping of the associated structure in Section 2.4 of the LRA. The "spaces approach" used to scope the civil/structural components in these structures ensures all load handling systems that serve an intended function (e.g., seismic II/I) were included in the scope of license renewal.

These components are in structural scope (Section 2.4 of the LRA) and their intended function is Structural Support. The Component Type "Steel Components: All Structural Steel" for each building covers the passive long-lived components for these items (e.g., AMR Tables 3.5.2-2, 3.5.2-3, etc.). The Structural Monitoring Program is credited for aging management of these passive long-lived components.

RAI 2.4-5

To completely clarify the scope of the ultimate heat sink structures, provide the following additional information:

a. Describe the River Water system that transports water from the river water intake structure to the storage pond and explain why the structures in this system are not within the scope of license renewal. Also, can there be a reverse flow of water that can reduce the water level in the storage pond, and consequently jeopardize the intended function of the ultimate heat sink? If applicable, what structures would prevent such an occurrence and are they included in the LR scope?

Response:

Except for some pond level switches and associated tubing (addressed in LRA Tables 2.3.3.5 and 2.3.3.7), the river water system at FNP is not in the scope of license renewal because it does not meet the criteria of 10 CFR 54.4 (a). The storage pond is supplied from the river water system and the supply line outlet is physically located above the storage pond's normal water level as well as above the minimum emergency water level. Although the supply line outlet is slightly below the pond's maximum possible flood level (spillway elevation), any siphoning effect would be broken well before the pond water level reached the normal elevation or the minimum emergency elevation. Any reverse flow of water from the storage pond to the river via a siphoning effect in the river water system cannot deplete that portion of the pond's volume credited for emergency use. Therefore, the pond volume relied upon in an emergency cannot be depleted via the river water system.

RAI 2.4-5

To completely clarify the scope of the ultimate heat sink structures, provide the following additional information:

b. In LRA Section 2.4.2.5, the discussion of the Storage Pond Spillway Structure does not include a description of the Spillway Intake and Discharge Canals. These canals are described in FSAR Section 2.4.8.2. Further information on these canals (channels) is provided in FSAR Section 2.4.14.2, which states:

> "The spillway channel shall be inspected after each operation of sufficient magnitude to have a potential for erosion. A discharge of 80 ft^3/s corresponding to a pool at elevation 187.0 has been selected as the minimum flow for which inspection shall be required. At this discharge the flow in the grassed discharge channel would have an average velocity of about 1.3 ft per second with a flow depth of 1.3 ft. The pond level will be monitored in the control room. Whenever the operator observes or inspection of the chart indicates that the pool level is greater than or equal to elevation 187.0, the channels and structure shall be inspected at the end of the discharge period, as required by the Technical Requirements Manual. Eroded areas that affect or can affect the channel bank slopes or that are more than 4 ft deep should be promptly repaired. Because of the expected infrequent use of the spillway, the channels and structure shall also be inspected biennially, as required by the Technical Requirements Manual.

Response:

The Spillway Intake and Discharge Canals are earthen canal design features for directing the spillage flow from the emergency cooling pond (ultimate heat sink) resulting from an unusual rainfall/flooding event (exceeding the maximum 5-year storm per UFSAR Section 2.4.14.2). The Spillway Intake and Discharge Canals do not perform a safe shutdown or accident mitigation function and therefore do not meet the scoping criteria of 10 CFR 54.4(a)(1). These features do not perform a function that demonstrates compliance with the Commission's regulations for any of the events listed in 10 CFR 54.4(a)(3). In addition, there is no failure mode for the canals that can adversely affect a safety related function or the performance of safety related equipment and therefore do not meet the scoping criteria of 10 CFR 54.4(a)(2). The canals are inspected periodically and after any significant discharge event as stated in UFSAR Section 2.4.14.2, therefore the current licensing basis ensures the material condition of the canals is maintained. UFSAR Section 2.4.8.2 states for the canals that "Additional erosion protection is not required since the spillway structure is designed to prevent impairment of emergency cooling pond banks in the unlikely event of extreme channel erosion and degradation." Therefore, the spillway structure "protects" the emergency cooling pond banks and is in scope for license renewal, but the canals do no meet any of the 10 CFR 54.4(a) scoping criteria. (The Storage Pond Spillway Structure is in the scope of License Renewal as indicated in LRA Table 2.2-1e and Section 2.4.2.5.)

In summary, these canals do not satisfy the criteria as defined in 10 CFR 54.4(a) and so are not within the scope of license renewal.