October 25, 2001

LICENSEES: Virginia Electric Power Company

FACILITIES: North Anna, Units 1 and 2
Surry, Units 1 and 2

SUBJECT: SUMMARY OF SEPTEMBER 25 and 26, 2001, TELECOMMUNICATION WITH VIRGINIA ELECTRIC AND POWER COMPANY

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A draft of this telephone conversation summary was provided to VEPCO to allow them the opportunity to comment on the contents of its input prior to the summary being issued.

/***RA***/

Robert J. Prato, Project Manager
License Renewal and Standardization Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos. 50-338, 50-339, 50-280, and 50-281

Attachment: As stated

cc w/att: See next page

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SUMMARY OF TELECOMMUNICATION WITH
VIRGINIA ELECTRIC AND POWER COMPANY
SEPTEMBER 25 and 26, 2001

Section 2.4, "Structures"

RAI 2.4.1-1 In both LRAs, Section 2.4.1, the applicant states that the containment is divided by the crane wall that supports the polar crane on an outer annulus section and a central section. However, the polar crane and the crane wall are not listed in Table 2.4.1-1 as components that are subject to an aging management review (AMR). Identify where in the LRA, is the polar crane and its support subject to an AMR or provide a technical justification for not considering the polar crane and its support structure as being subject to an AMR.

The applicant confirmed that both the polar crane and its supporting structures are within the scope of license renewal and subject to an AMR. The polar crane is included in the component commodity group "structural crane components" as identified in Table 2.4.12-1, and the crane wall is included in the structural commodity group "walls" in Table 2.4.1-1

The staff found the applicant's response acceptable and will not need any additional information regarding this matter.

Item 2.4.1-2 In both LRA, Section 2.4.1, the applicant states that the personnel access hatch has an inner and an outer door that are maintained in the closed position by interlocking tooth closure mechanisms. Explain whether the operating mechanism of the personnel hatch that perform a passive function associated with maintaining the hatch in a closed position (e.g., gears, latches, and hinges, and equalizing valves) are subject to an AMR.

The applicant explained that for the personnel access hatch, the interlocking tooth closure mechanism aligns the hatch and holds it in place providing the containment pressure boundary intended function associated with the personnel hatch. The latches and hinges do not perform an intended function, and there are no gears associated with the personnel hatch. In addition, the applicant explained that the equalizing valve body is within the scope of license renewal and is managed for aging.

The staff found the applicant's clarification acceptable and will not need any additional information regarding this matter.

Item 2.4.1-3 In the NAS LRA, Table 2.4.1-1, the applicant lists, among others, the fuel transfer tube and its protection shield, and the gate valve, as the components subject to an AMR. However, the table does not include some of the attachments of the fuel transfer tube, such as the sleeves that are welded to the liner plate and blind flanges that cover the tube when the fuel transfer tube is not in use. Also, the NAS LRA, Section 2.4.1 does not describe these components. Because they

perform the intended function to maintain containment pressure boundary, the staff considers these components as being within the scope of license renewal and subject to an AMR. Provide information on these attachments and explain whether they should be subject to an AMR. This item is also applicable to the SPS LRA.

The applicant confirmed that both the fuel transfer tube sleeves and blind flanges are within the scope of license renewal and subject to an AMR. The fuel transfer tube sleeves and blind flanges are included in the component commodity group "mechanical-penetrations" as identified in Table 2.4.1-1. The blind flanges are considered part of the fuel transfer tube in Table 2.4.1-1.

The staff found the applicant's response acceptable and will not need any additional information regarding this matter.

Item 2.4.2-1 In the NAS LRA, Section 2.4.2, the applicant describes the structures and structural components of the auxiliary building, cable vault, cable tunnel, pipe tunnel, and motor control center room. However, the following structural components described in this section are not listed in Table 2.4.2-1 of the NAP LRA for an AMR: fire and EQ doors, fire barrier penetrations, fire barrier seals, and membrane roofing system. Verify the table to ensure its completeness or provide technical justification as to why these components should not be subect to an AMR. This item is also applicable to the SPS LRA.

Fire and EQ doors, and fire barrier penetration and seals are subject to an AMR, and are listed in Section 2.4.11 as "Miscellaneous Structural Commodities." Refer to Table 2.4.11-1.

Membrane roofing is not included in the Table 2.4.2-1 because it does not perform an intended function and, therefore, is not in the scope of license renewal.

The staff found the applicant's verification acceptable and will not need any additional information regarding this matter.

tem 2.4.2-2 In the NAP LRA, Section 2.4.2, the applicant states that the auxiliary building is comprised of a reinforced concrete foundation mat and below grade reinforced concrete walls (substructure), etc. However, the applicant did not explain whether the foundation mat and the lower portion of the walls have expansion joints, water-stops or waterproofing membranes. The staff considers water-stops important in maintaining the integrity of the concrete components to which they connect. The groundwater in-leakage into the concrete construction joints could occur as a result of degradation of the water-stops. Provide information on structural sealant for the below-grade construction joints and explain whether the water-stops should be treated as an unique commodity subject to an AMR.

The applicant confirmed that water-stops are in the scope of license renewal. The applicant referred the staff to Appendix C, Section C2.4, that states that

water-stops are considered part of the components that they are integral to and are not identified as a separate within the LRA.

The staff found the applicant's response acceptable and will not need any additional information regarding this matter.

Item 2.4.3-1 In the NAS LRA, Section 2.4.3 (pages 2-104, 2-105), the applicant describes the auxiliary feedwater pump house, auxiliary feedwater tunnel, casing cooling pump house, service water pump house, service water pipe expansion joint enclosure, service water valve house, and service water tie-vault that are Class 1 structures within the scope of license renewal. However, the SPS LRA, Section 2.4.3, does not address any equivalent structures that perform the similar functions. Identify any structures at the SPS that house or protect the equipment of the auxiliary feedwater system or the service water system that should be included in the scope of license renewal.

SPS does not have these specific buildings. The auxiliary feedwater systems are located in the Main Steam Valve House along with its piping (part of the piping is located (buried) in the yard). The part of the service water system that includes the emergency service water pumps is located in the Low Level Intake Structure and is addressed in the LRA, Section 2.4.6, the "Intake Structure." The casing cooling pump system is not required at SPS, because of the differences in design between SPS and NAS with regard to the net positive suction head needed for the recirculation spray system pumps.

The staff found the applicant's response acceptable and will not need any additional information regarding this matter.

Item 2.4.3-2 In the NAS LRA, Section 2.4.3, (page 2-105), the applicant states that the floor slab is concrete on grade and the reinforced concrete walls are supported on concrete footings. However, the concrete footings are not listed in the NAS LRA, Table 2.4.3-1, as one of the components that is subject to an AMR. Verify the table to ensure its completeness.

The concrete footings are not listed as a separate item, since the slab on grade of this structure is monolithic with wall footing. Footings are, therefore, addressed and have been evaluated as part of the slab on grade, since the footings are subject to the same environment and are made up of the same material as the slab on grade.

The staff found the applicant's verification acceptable and will not need any additional information regarding this matter.

Item 2.4.3-3 In the NAP LRA, Section 2.4.3 (page 2-105), the applicant states that the structures also have missile-protected concrete roof openings. However, Tables 2.4.3-8 and 2.4.3-10 of the NAS LRA do not list these missile protected concrete roof openings as the components subject to an AMR. Explain why the roof

openings which are specially shielded to perform their intended function should not be included in the table.

These roof openings are identified as concrete hatches in Tables 2.4.3-8 and 2.4.3-10, and one of its intended functions is missile barrier.

The staff found the applicant's clarification acceptable and will not need any additional information regarding this matter.

Item 2.4.3-4 The NAS Updated Final Safety Analysis Report (UFSAR), Section 3.8.1.1.7, states that the service water pump house contains, among others, the screen wells, traveling screens, basket, pump missile barriers, pump house footing, and wing walls. However, these structural components are not discussed or identified in NAS LRA, Section 2.4.3 (page 2-105) or Table 2.4.3-8. Provide the LRA sections that contain these components for license renewal or provide a technical justification as to why these components should not be included within the scope of license renewal.

The screen wells, which are comprised of concrete walls and floors, are integral with and addressed as part of the structure walls and floors of the Service Water Pump House (SWPH). The traveling screens are identified in the LRA, Table 2.3.3-6, as Filters/Strainers in the service water system. The baskets are provided to collect debris, are frequently cleaned, and do not affect the function of the traveling screens or any other safety-related components. The baskets, therefore, do not perform an intended function, and are not in scope of license renewal. The pump missile barriers are addressed as part of internal and external walls of the SWPH. The footing for the Service Water Pump House is identified in LRA, Table 2.4.3-8, as foundation mat slabs. The wing walls are addressed as part of the SWPH structure's external walls.

The staff found the applicant's response acceptable and will not need any additional information regarding this matter.

Item 2.4.3-5 In the SPS LRA, Section 2.4.3, the applicant states that the fire pump house is divided by a wall with a metal door, forming two separate rooms (page 2-100). The SPS UFSAR, Section 9.10.4.23, contains a statement that the door in this wall is fire rated in excess of 3 hours. However, this interior fire door is not listed in SPS LRA, Table 2.4.3-5, as a component subject to an AMR. Verify the table to ensure its completeness or justify why the fire door should not be within scope of license renewal.

The fire door in question is included in LRA, Table 2.4.3-5, as a missile protection door with the intended functions of both missile barrier and fire barrier. (Doors with a fire barrier intended function are also addressed in the Miscellaneous Structural Commodities section, Section 2.4.11, of the LRA.)

The staff found the applicant's verification acceptable and will not need any additional information regarding this matter.

Item 2.4.3-6 In the SPS LRA, Section 2.4.3, the applicant indicates that the containment spray pump building consists of containment spray and refueling water recirculation pump areas that are within the scope of license renewal (page 2-99). SPS UFSAR, Section 9.10.4.13 states that the containment spray pump building and auxiliary feedwater pump building for each unit are essentially identical structures, each located adjacent to its unit's reactor containment building. However, the SPS auxiliary feedwater pump building is not addressed in SPS LRA, Section 2.4.3.

The UFSAR, Section 9.10.4.13, describes a single building that houses the containment spray pumps and the auxiliary feedwater pumps in separate compartments. Physically, there are two structures – The Containment Spray Pump Building and the Main Steam Valve House – that comprise the building described in UFSAR, Section 9.10.4.13. The auxiliary feedwater pumps are located in the Main Steam Valve House, which is within the scope of license renewal and is described in LRA Section 2.4.3.

The staff found the applicant's response acceptable and will not need any additional information regarding this matter.

Item 2.4.4-1 In both LRA, Section 2.4.4, the applicant describes the reinforced concrete pipe tunnel for the fuel building structure (page 2-107 of the NAS LRA) and fuel transfer canals for the spent fuel pool (page 2-108). These structural components are not listed in the LRAs, Table 2.4.4-1. Identify where in the LRA are these components identified as being within the scope of license renewal.

The fuel pool, including the fuel transfer canal, consists of concrete walls above the foundation mat. The foundation mat and all walls are included in the LRA Table 2.4.4-1. Similarly, the pipe tunnel has not been included separately. The walls and floor slabs, listed in the tables, envelop the structural members of the concrete pipe tunnel for the fuel building structure.

The staff found the applicant's response acceptable and will not need any additional information regarding this matter.

Item 2.4.4-2 The NAS UFSAR, Section 9.1.2, which addresses spent fuel storage, indicates that the movable platform crane is used to move the three spent fuel pool gates. The platform crane is not described or identified in LRA, Section 2.4.4, and Table 2.4.4-1. Verify whether the crane is within the scope of license renewal.

The movable platform crane is in the scope of license renewal, and is identified in the LRA, Section 2.4.12, as the fuel handling bridge crane.

The staff found the applicant's verification acceptable and will not need any additional information regarding this matter.

Item 2.4.5-1 In the NAS LRA, Section 2.4.5, the applicant describes (among others) the structure of the station blackout (SBO) building (page 2-111). The following structural components are not listed in NAS LRA, Table 2.4.5-3, as requiring an

AMR: concrete exterior walls, metal siding, and the concrete piers that support the spread footings. Verify the table to ensure its completeness.

Concrete exterior walls and metal siding of the Station Blackout Building are not included in Table 2.4.5-3 because they are not required to perform any intended function. Piers and footings are included in this Table as "Footing and grade beams."

The staff found the applicant's verification acceptable and will not need any additional information regarding this matter.

Item 2.4.5-2 In the SPS LRA, Section 2.4.5, the applicant describes (among others) the structure of the turbine building (page 2-104). However, the following structural components are not listed in SPS LRA, Table 2.4.5-1, as requiring an AMR: metal siding, sliding fire-rated steel doors, fire barrier penetrations, and fire barrier seals. Verify the table to ensure its completeness. In addition, the SPS UFSAR, Section 9.10.4.18 states that cable trays are located at all elevations of the turbine building (page 9.10-37). These cable trays and their supports are not discussed or identified in SPS LRA, Section 2.4.5 or Table 2.4.5-1. Explain whether these cable trays and supports should be considered as the structural components or mechanical components. Is there any crane in the turbine building that is within the scope of license renewal?

Metal siding is not included in Table 2.4.5-1 because it does not perform an intended function. All types of fire-rated doors and fire barrier penetration seals are addressed generically in Section 2.4.11 under "Miscellaneous Structural Commodities," refer to Table 2.4.11-1. Cable trays and supports are considered as structural components and are addressed in Section 2.5.4.10, General Structural Supports. There is no crane in the Turbine Building that is within the scope of license renewal.

The staff found the applicant's clarification acceptable and will not need any additional information regarding this matter.

Item 2.4.5-3 In the SPS LRA, Section 2.4.5, the applicant describes (among others) the structure of the service building (page 2-105). The following structural components are not listed in SPS LRA, Table 2.4.5-2 as being subject to an AMR: reinforced concrete piers, structural steel framing that supports floor slabs, flood protection barriers, fire-rated doors and fire barriers. Verify the table to ensure its completeness or justify why these components should not be within the scope of license renewal.

In both LRAs, Table 2.4.5-2, concrete piers are included in the component "footing and grade beam." Structural steel framing that support floor slabs is included in the component commodity group "Concrete floor support framing and decking." Flood protection barriers are included in the component commodity group flood barriers." Fire-rated doors and fire barriers are covered in Section 2.4.11, "Miscellaneous Structural Commodities."

The staff found the applicant's verification acceptable and will not need any additional information regarding this matter.

Item 2.4.5-4 In the SPS LRA, Section 2.4.5, the applicant describes (among others) the condensate polishing building (page 2-106). However, this section only addresses the function of the building but does not describe the structure and components. Provide information on the portion of the structures that supports the station blackout (SBO) system cables and raceways.

The cables and raceway for the SBO (station blackout) system are located to the west of Column Line B.8 of the Condensate Polishing Building. At the 47' Elevation, the structural steel between Column Lines B.6 and B.8, and Column Lines 17.2 through 20 and above, supports the cables and raceway for the SBO system. Therefore, the portion of the mat that supports the columns meets License Renewal Criterion 3. These structures that support the cables and raceway are the only portions of the Condensate Building that are in the scope of license renewal and subject to an AMR, as identified in Table 2.4.5-5.

The staff found the applicant's clarification acceptable and will not need any additional information regarding this matter.

Item 2.4.6-1 The intake structures for the NAS and SPS are different designs. Please provide information on NAS intake structure regarding the structural components of the exposed deck and the pump houses on top of the deck in the NAS LRA, Section 2.4.6 (page 2-113). To support the staff's review of the SPS intake structure in the SPS LRA, Section 2.4.6 (pages 2-109, 2-110), please provide drawings that show the low-level intake structure, high-level intake structure, discharge tunnel and seal pit.

The intake structure at the river (SPS) and the intake structure on the reservoir (NAP) are similar in design (i.e., each intake structure has eight individual bays), with the exception of the structures located on roofs of structures.

Intake Structures

At SPS, the intake structure at the river is referred to as the "Low-Level Intake Structure." The Low-Level Intake Structure is an eight-bay (four bays per unit) concrete structure. Each bay has an associated circulating water pump, and three of the bays have an emergency diesel-driven service water pump. There is an Emergency Service Water Pump House (ESWPH) and a Switchgear Building (identified on Drawing 11448-LRM-FY-002 as the Electrical Equipment Room) located on the roof of the Low-Level Intake Structure. The Electrical Equipment Room, which house electrical equipment associated only with the circulating water system, is not in the scope of license renewal. The safety-related ESWPH, which houses the three diesel-driven emergency service water pumps, is in the scope of license renewal.

At NAS, the intake structure located on the reservoir is referred to as the Intake Structure. Like the SPS Low-Level Intake Structure, the NAS Intake Structure is an eight-bay (four bays per unit) concrete structure. Each bay has an associated circulating water pump and two of the bays have a motor-driven auxiliary service water pump. There is an Auxiliary Service Water Pump House (ASWPH) and a Fire Pump House located on the roof of the intake structure. There is also an Electrical Equipment Room adjacent to the intake structure that is identified on Drawing 11715-LRM-FY-001 as the Intake Structure Control House (ISCH). The safety-related ASWPH houses two auxiliary service water pumps and two screen water pumps, and is in the scope of license renewal. The Fire Pump House that provides shelter to the auxiliary motor-driven fire pump is in the scope of license renewal. The Intake Structure Control House, which is located adjacent to the west side of the Intake Structure, is also in the scope of license renewal. The ISCH houses the electrical equipment that is required to operate the auxiliary motor-driven fire pump. The electrical cable that runs from the ISCH to the auxiliary fire pump is routed in a concrete duct bank (included in the Yard Structures) and is supported by the intake tunnel header. Because the intake tunnel header provides support to this duct bank, the intake tunnel header is in the scope of license renewal.

At SPS, there is a safety-related high-level intake structure for each unit at the station end of the intake canal that provides conduits for water flow from the intake canal to the 96-inch concrete circulating water pipe located at the end of each bay area. Each high-level intake structure is a four-bay structure. There are no pumps associated with the high-level intake structure. Water flows by gravity through the high-level intake structure, the 96-inch circulating water lines, and the discharge tunnel and seal-pit, where it is discharged into the discharge canal.

At NAS, there is no High-Level Intake Structure.

Discharge Tunnel and Seal Pit

The SPS Discharge Tunnel and Seal Pit is described on page 2-111 of the LRA.

The staff found the applicant's response acceptable and will not need any additional information regarding this matter.

Item 2.4.7-1 In the SPS LRA, Section 2.4.7, the applicant describes the yard structures for the SPS. The following structural components are not identified in the SPS LRA, Table 2.4.7-1, as being subject to an AMR: anchor bolts and steel skirt for the chemical addition tank foundation, anchor bolts and missile walls for the emergency condensate storage tank foundation, anchor bolts for the refueling water storage tank foundation, and a concrete bridge for the fuel oil lines missile barriers. Verify the table to ensure its completeness.

Anchor Bolts

Anchor bolts are not uniquely identified in Table 2.4.7-1. The embedded portion of anchor bolts are evaluated as part of Yard Structures. The embedded portion of the anchor bolts are evaluated as part of steel embedded in concrete (similar to reinforcing bars) and are evaluated with concrete.

The portion of the anchor bolts that is not embedded in concrete is evaluated as part of General Structural Supports (Section 2.4.10 of the LRA). As discussed in the LRAs, Section C2.2, for most applications, bolting has not been uniquely identified, and has been evaluated as part of the larger host component. Section C2.2 does identify the specific applications where bolting is uniquely identified.

Steel Skirt for the Chemical Addition Tank

The steel skirt is welded to the chemical addition tank and is considered part of the tank. The chemical addition tank is included in the containment spray system, and is described in the LRAs, Section 2.3.2.

Missile Walls for the Emergency Condensate Storage Tank

The missile walls for the emergency condensate storage tanks are listed in the LRAs, Table 2.4.7-1, as walls with a missile barrier intended function. As described in the LRAs, Section 2.4.7, a reinforce concrete missile barrier completely encapsulates each tank. The missile barrier has 2-foot-thick reinforced concrete walls, which are integral to the mat foundation, and a sloping, reinforced concrete roof.

Concrete Bridge for the Fuel Oil Lines Missile Barriers

As described in the LRAs, page 2-114, the concrete bridge that acts as a missile barrier is composed of a 1 foot 2½ inch concrete slab (slab on grade) resting on a ½-inch-thick steel plate (missile shield). The concrete slab and steel plate act as a composite design. The concrete slab is supported at both ends by a spread footing. All of these items are identified in the LRAs, Table 2.4.7-1.

The staff found the applicant's response acceptable and will not need any additional information regarding this matter.

Item 2.4.7-2 In the NAS LRA, Section 2.4.7, the applicant describes the yard structures for the North Anna Plant. The following structural components are not listed in NAS LRA, Section 2.4.7-1, for an AMR: blind carbon-steel flange cover for the emergency condensate storage tank (page 2-116), anchor bolts for the refueling water storage tank foundation and the casing cooling tank foundation. Verify the table to ensure its completeness. Explain whether there is any concrete pit or foundation to support the two underground fuel oil tanks (page 2-116).

Blind Carbon-Steel Flange Cover for the Emergency Condensate Storage Tank

As indicated on Page 2-116, the blind carbon-steel flange cover for the emergency condensate storage tank is listed in Table 2.4.7-1 as missile shield. In Table 3.5.7-1 on Page 3-299 (emergency condensate storage tank), missile shields are indicated as carbon steel.

Anchor Bolts

Anchor bolts are not uniquely identified in Table 2.4.7-1. The embedded portion of anchor bolts is evaluated as part of Yard Structures. The embedded portion of anchor bolts is considered as steel embedded in concrete (similar to reinforcing bars) and evaluated with the concrete.

The portion of the anchor bolts that is not embedded in concrete is evaluated as part of General Structural Supports (Section 2.4.10 of the LRAs). As discussed in the LRAs, Section C2.2, (for most applications) bolting (includes anchor bolts) has not been uniquely identified, and is typically evaluated as part of the larger host component. Both LRAs, Section C2.2, identify the specific applications where bolting is uniquely identified.

Concrete Pit or Foundation to Support the Two Underground Fuel Oil Tanks

There is no concrete pit or foundation used to support the two underground tanks. The two tanks are direct buried and supported by compacted select fill with 4-inches of oil sand placed all around the tanks.

The staff found the applicant's response acceptable and will not need any additional information regarding this matter.

Item 2.4.9-1 In both LRAs, Section 2.4.9, the applicant describes the reactor coolant system supports for the reactor vessel (RV), reactor coolant pump (RCP), steam generator (S/G), and the pressurizer (PZR). However, the LRAs, Table 2.4.9-1, lists the RCP, S/G, and PZR support structure to represent the components of the reactor coolant system supports subject to an AMR. The RV support is not included in the table. The structural support for each of these reactor coolant system supports is designed as a structural support assembly that is not a typical design applicable to all the reactor coolant system equipment supports. Explain which LRA table lists the reactor vessel support to require an AMR. Whether the reactor coolant system equipment supports should be listed separately in the table, such as the RCP support assembly, S/G support assembly, and PZR support assembly.

Although not explicitly listed as the Reactor Vessel (RV) support structure, the components that support the RV are identified in both LRAs, Table 2.4.9-1. As discussed in Section 2.4.9 of the LRAs, support for the RV is provided by six sliding foot assemblies that are mounted to the neutron shield tank (NST). The

following RV support structural members are identified in Table 2.4.9-1: sliding foot assembly, neutron shield tank, and neutron shield tank support structure.

The support structures for the RCP, SG, and PZR have not been listed separately in Table 2.4.9-1, since the materials and the environments are similar (carbon and low-alloy steel in an air and borated water leakage environment). The remaining structural members listed in Table 2.4.9-1 are general support elements associated with the NSSS Supports.

The staff found the applicant's response acceptable and will not need any additional information regarding this matter.

Item 2.4.9-2 In the NAS LRA, Table 2.2-4, the applicant lists 22 structures that are not within the scope of license renewal. The staff agrees that most of these structures do not perform an intended function and, therefore, do not require an AMR. However, the following structures in the table need to be verified to determine whether they should be included in the scope of license renewal: (1) concrete foundations for the main transformers and station service transformers, (2) fire pump house embankment, (3) independent spent fuel storage facility, (4) spent fuel cask handling structure, and (5) transmission line towers.

- The main transformers and station service transformers are not in the scope of license renewal; therefore, the concrete foundations for these transformers are not in scope. As identified in Section 2.4.7 of the LRA, the dikes and firewalls associated with these transformers are in the scope of license renewal due to Criterion 3 (fire protection). The dikes and firewalls prevent a fire from spreading from the transformer area.

- The Fire Pump House embankment surrounds and supports a fabric tank. The fabric tank supplies water to the fire protection system for Warehouse #5. Warehouse #5 fire protection system is not in the scope of license renewal. Therefore, the fabric tank and the embankment are not in the scope of license renewal, since they do not perform an intended function.

- The Independent Spent Fuel Storage Facility is not licensed under 10 CFR Part 50; therefore, it is not addressed as part of the LRA. The Independent Spent Fuel Storage Facility is licensed separately under 10 CFR Part 72.

- The spent fuel cask handling structure is a non-safety-related, non-seismic structure that is located south of the Decontamination Building. This structure is not in scope, since it does not perform any intended function.

- The cables that are supported by the transmission line towers are not in the scope of license renewal, therefore, the towers are also not in scope.

The staff found the applicant's verification acceptable and will not need any additional information regarding this matter.

Section 4.0, "Time Limited Aging Analysis" (TLAA)

The applicant and the staff had general discussions relating to TLAAs. More specifically, they discussed the following TLAA subjects:

4.1 Identification of Time-Limited Aging Analyses
4.3 Metal Fatigue
4.5 Concrete Containment Tendon Prestress
4.6 Containment Liner Plate, Metal Containments, and Penetrations Fatigue Analysis
4.7.1 Crane Load Cycle Limit
4.7.4 Spent Fuel Pool Liner
4.7.5 Piping Subsurface Indications

No specific concerns were resolved during these dicussions, therefore, the staff will develop RAIs to obtain the following additional information:

4.1 Identification of Time-Limited Aging Analyses

Item 4.1-1 In both LRAs, Table 4.1-1, the applicant did not identify pipe break postulation based on cumulative usage factor (CUF) as a TLAA. Section 3A.46 of the NAS UFSAR describes the criteria used to provide protection against pipe whip inside the containment. Part of the criteria specifies the postulation of pipe breaks at locations where the CUF exceeds 0.1. Although the fatigue usage factor calculation was identified as a TLAA, the pipe break criterion was not identified as a TLAA. However, the usage factor calculation used to identify postulated pipe break locations meets the definition of a TLAA as specified in 10 CFR 54.3 and, therefore, the staff considers the associated criteria for pipe break postulation to be a TLAA. Provide a description of the TLAA performed to address the pipe break criteria for North Anna. Also identify any pipe break postulations based on CUF at Surry and describe the TLAA performed for these locations. Indicate how these TLAAs meet the requirements of 10 CFR 54.21(c).

4.3 Metal Fatigue

Item 4.3-1 In both LRAs, Section 4.3.1, the applicant discusses its evaluation of the fatigue TLAA for ASME Class 1 components. The discussion indicates that based on its review of the plant operating history VEPCO concluded that the number of cycles assumed in the design of the ASME Class 1 components are conservative and bounding for the period of extended operation. Table 5.2-4 of the North Anna UFSAR and Table 4.1-8 of the Surry UFSAR contain a list transient design conditions and associated design cycles. Provide the following information for each transient listed in these tables:

- The current number of operating cycles and a description of the method used to determine the number and severity of the design transients from the plant operating history.

- The number of operating cycles estimated for 60 years of plant operation and a description of the method used to estimate the number of cycles at 60 years.

- A comparison of the design transients listed in UFSAR with the transients monitored by the Transient Cyclic Counting Program (TCCP) as shown in Section B3.2 of the LRA. Identify any transients listed in the UFSAR that are not monitored by the TCCP and explain why it is not necessary to monitor these transients.

- Section B3.2 of the North Anna LRA indicates that the charging line nozzle has been instrumented to evaluate the impact of charging line flow transients. Describe the instrumentation used to monitor charging flow transients explain how the data obtained from this instrumentation is used by the TCCP.

- Table 3.1.3-W1 of the LRA provides the response to Renewal Applicant Action Item 11 specified in WCAP -14577, Revision 1-A regarding fatigue TLAA of the reactor vessel internals. The response indicates that the TCCP will assure that the transients will remain within their design values for the period of extended operation. List the transients that contribute to the fatigue usage for each component listed in Table 3-3 of WCAP-14577, Revision 1-A and discuss how the TCCP monitors these transients.

Item 4.3-2 As discussed in Item 4.3.1-1, above, the applicant indicates that the existing design transients and cycle frequencies are conservative and bounding for the period of extended operation. However, VEPCO also indicated that the North Anna RPV closure studs and RCS loop stop valves were reanalyzed. Explain why additional analyses were required for these components in light of the statement in the LRA that design transients and frequencies are conservative and bounding for the period of extended operation.

Item 4.3-3 Identify whether calculations that meet the definition of a TLAA were performed in response to NRC Bulletin 88-08, “Thermal Stresses in Piping Connected to Reactor Coolant Systems.” Describe the actions taken to address this bulletin during the period of extended operation.

Item 4.3-4 The Westinghouse Owners Group issued Topical Report WCAP-14575-A, “Aging Management Evaluation for Class 1 Piping and Associated Pressure Boundary Components,” to address aging management of the RCS piping. In both LRAs, Section 3.1.1, the applicant addresses the applicability of WCAP-14575-A to North Anna and Surry. Table 3.1.1-W1 of the LRAs provide the response to the renewal applicant action items developed as a result of the staff review of the topical report. Renewal Applicant Action Item 8 requests that the applicant address components labeled I-M and I-RA in Tables 3-2 through 3-16 of WCAP-14575-A. The applicant indicated that the components in Tables 3-2 through 3-16 were addressed by an aging management activity, plant-specific

fatigue evaluation or code evaluation. However, the applicant did not provide specific details for each component. Provide a summary of the resolution for each of the components labeled I-M and I-RA in Tables 3-2 through 3-16.

Item 4.3-5 The Westinghouse Owners Group has issued the generic Topical Report WCAP-14574-A to address aging management of pressurizers. In both LRAs, Section 3.1.4, the applicant discusses the applicability of WCAP-14574-A to North Anna and Surry. Table 3.1.4-W1 of the LRA, provides the response to the renewal applicant action items developed as a result of the staff review of the topical report. Renewal Applicant Action Item 1 requests that the applicant demonstrate that the pressurizer sub-component CUFs remain below 1.0 for the period of extended operation. Table 2-10 of WCAP-14574-A indicates that the ASME Section III Class 1 fatigue CUF criterion could be exceed at several pressurizer sub-component locations during the period of extended operation. WCAP-14574-A also identified recent unanticipated transients that were not considered in the original ASME Section III Class 1 fatigue analyses, including inflow/outflow thermal transients. The response to applicant action item 1 refers to the TLAA evaluation in Section 4.3 of the LRA. The discussion of the pressurizer surge line indicates that the inflow/outflow transients have been evaluated for the pressurizer components. Provide the following information:

- Confirm that the additional transients discussed in WCAP-14574-A, not considered in the original design, have been addressed at North Anna and Surry.

- Show the ASME Section III Class 1 CLB CUFs for the applicable sub-components of the North Anna and Surry pressurizers specified in Table 2-10 of WCAP-14574-A and the corresponding CUFs for the extended period of operation.

- Discuss the impact of the environmental fatigue correlations provided in NUREG/CR-6583, “Effects of LWR Coolant Environments on Fatigue Design Curves of Carbon and Low-Alloy Steels,” and NUREG/CR-5704, “Effects of LWR Coolant Environments on Fatigue on Fatigue Design Curves of Austenitic Stainless Steels,” on the above results.

Item 4.3-6 In both LRAs, Section 4.3.4, the applicant evaluates the impact of the reactor water environment on the fatigue life of components. The discussion references the fatigue sensitive component locations for an early vintage Westinghouse plant identified in NUREG/CR-6260, “Application of NUREG/CR-5999 Interim Fatigue Curves to Selected Nuclear Power Plant Components.” The LRAs indicates that the results of the NUREG/CR-6260 studies were used to scale up the North Anna and Surry plant-specific usage factors for the same locations to account for environmental effects. The LRAs also indicates that the later environmental fatigue correlations contained in NUREG/CR-6583, “Effects of LWR Coolant Environments on Fatigue Design Curves of Carbon and Low-Alloy Steels,” and NUREG/CR-5704, “Effects of LWR Coolant Environments on Fatigue on Fatigue Design Curves of Austenitic Stainless Steels,” were considered in the evaluation. Provide the results of the usage factor evaluation

for each of the six component locations listed in NUREG/CR-6260. Discuss how the factors used to scale up the North Anna and Surry plant-specific usage factors were derived. Also discuss how the later environmental data provided in NUREG/CR-6583 and NUREG/CR-5704 were factored in the evaluations. Discuss how the North Anna charging line flow transients monitored by the TCCP are factored in these evaluations.

Item 4.3-7 In both LRAs, Section 4.3.4, the applicant indicates that the pressurizer surge line required further evaluation for environmental fatigue during the period of extended operation. The applicant further indicated that it would use an aging management program to address fatigue of the surge line during the period of extended operation. The aging management program would rely on an augmented inspection program to address surge line fatigue during the period of extended operation. As indicated in the draft safety evaluation on Westinghouse Owners Group generic technical report, WCAP -14575, "License Renewal Evaluation: Aging Management Evaluation for Class 1 Piping and Associated Pressure Boundary Components," the NRC has not endorsed a procedure on a generic basis which allows for augmented inspections in lieu of meeting the fatigue usage criteria. The applicant has not provided a technical basis demonstrating the technical adequacy of its proposal. Provide a detailed technical evaluation which demonstrates the proposed inspections provide an adequate technical basis for detecting fatigue cracking before such cracking leads to through wall cracking or pipe failure. The detailed technical evaluation should be sufficiently conservative to address all uncertainties associated with the technical evaluation (e.g., fatigue crack initiation and detection, fatigue crack size, and fatigue crack growth rate considering environmental factors). As an alternative to the detailed technical evaluation, provide a commitment monitor the fatigue usage, including environmental effects, during the period of extended operation, and to take corrective actions, as approved by the staff, if the usage is projected to exceed one.

4.7.4 Spent Fuel Pool Liner

Item 4.7.4-1 Provide a tabulated summary of the number of cycles considered in the fatigue analysis for normal, upset, emergency, and faulted conditions together with the temperature ranges considered for each condition.

Item 4.7.4-2 Identify the temperature range considered in calculating the allowable thermal cycles for the most severe thermal cycles.

Item 4.7.4-3 As the stainless pool liner is attached to the concrete walls and the bottom slab (or basemat), the fatigue characteristics of the liner will be influenced by the integrity of its anchorages to the concrete, and the effects of high sustained (> 15 days) temperature on the concrete. Provide a summary of procedures used to incorporate these effects in the pool liner time-limited fatigue analysis.

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Attachment 2

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