July 31, 2002

LICENSEE: Florida Power and Light Company (FPL)

SUBJECT: SUMMARY OF JUNE 10 – 11, 2002, MEETING WITH FLORIDA POWER AND LIGHT COMPANY CONCERNING POTENTIAL REQUESTS FOR ADDITIONAL INFORMATION PERTAINING TO THE ST. LUCIE, UNITS 1 AND 2, LICENSE RENEWAL APPLICATION

The Nuclear Regulatory Commission (NRC) staff met with representatives of Florida Power and Light Company (FPL) on June 10 and 11, 2002, to discuss draft requests for additional information (RAIs) concerning the St. Lucie, Units 1 and 2, license renewal application. The staff and FPL continued these discussion during conference calls on June 20 and 26, and July 1, 2002. The areas discussed were as follows:

- Sec. 2.3: Scoping and Screening Results (SSR) - Mechanical
- Sec. 2.5: SSR - Electrical and Instrumentation Control Systems
- Sec. 3.1: Aging Management Review (AMR) of Reactor Coolant Systems
- Sec. 3.2: AMR of Emergency Core Cooling Systems
- Sec. 3.4: AMR of Steam and Power Conversion Systems
- Sec. 4.6.1: Time-Limited Aging Analysis (TLAA) of Leak-Before-Break
- Sec. 4.6.4: TLAA of Alloy 600 Instrument Nozzle Repairs
- Sec. B.3.1.2: Galvanic Corrosion Susceptibility Inspection Program
- Sec. B.3.2.1: Alloy 600 Inspection Program
- Sec. B.3.2.2: ASME Section XI, Subsection IWB, IWC, and IWD Inservice Inspections
- Sec. B.3.2.5: Chemistry Control Program
- Sec. B.3.2.13: Steam Generator Integrity Program
- Sec. B.3.2.14: Systems and Structures Monitoring Program

The meeting was useful in clarifying the intent of staff's draft RAIs. Several of these draft RAIs were resolved, while the balance were formally sent to the applicant. The resolution of draft RAIs was based on information available in the license renewal application or in other docketed material. In other cases, the staff consolidated several draft RAIs that addressed different aspects of the same concern and issued a single RAI.

Enclosures 1and 2 provide lists of attendees. Enclosure 3 documents the basis for resolving or disposing of the draft RAIs that were not issued to the applicant.

/***RA***/

Noel Dudley, Senior Project Manager
License Renewal and Environmental Impacts Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos. 50-335 and 50-389

Enclosures: As Stated

cc w/enclosures: See next page

Enclosures 1and 2 provide lists of attendees. Enclosure 3 documents the basis for resolving or disposing of the draft RAIs that were not issued to the applicant.

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Docket Nos. 50-335 and 50-389

Enclosures: As Stated

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Clarify Contents of Application for Renewed Operating Licenses
St. Lucie, Units 1 and 2
June 10 and 11, 2002

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Steve Hale	Florida Power and Light Company (FPL)
Tony Menocal	FPL
Noel Dudley	NRC
Simon Sheng	NRC
Bart Fu	NRC
John Tsao	NRC
Tom McLellan	NRC
Eva Brown	NRC
Andrea Keim	NRC
Y.C. (Rene) Li	NRC
James Medoff	NRC
Wes Held	NRC
Meena Khanna	NRC
Cliff Munson	NRC
Janak Raval	NRC
Naeem Iqbal	NRC
Greg Galletti	NRC
Richard McIntyre	NRC
R.P. Goel	NRC
J.S. Guo	NRC
David Shum	NRC
Chang-Yung Li	NRC
Steven Jones	NRC
Ron Young	NRC
Ken Dugan	ISL
BennetGitnick	ISL
Harvey Abelson	ISL
Kim Green	ISL
Shi-Wing Tam	ANL via telephone
Vic Shaw	ANL via telephone
David Ma	ANL via telephone

Enclosure 1

NRC CONFERENCE CALLS ATTENDANCE LIST
Clarify Contents of Application for Renewed Operating Licenses
St. Lucie, Units 1 and 2
June 20 and 26, 2002
July 1 and 23, 2002

June 20, 2002, Conference Call

NRC Attendees	Florida Power and Light Company Attendees
Noel Dudley	Steve Hale
Meena Khanna	Tony Menocal
John Knox	
James Medoff	

June 26, 2002, Conference Call

NRC Attendees	Florida Power and Light Company Attendees
Noel Dudley	Steve Hale
John Knox	Tony Menocal
Steve Jones	Bruce Beisel
Ron Young	
Diane Jackson	
Daniel Frumkin	
Chang Lee	
David Shum	
Joe Gola	
Jin-Sien Guo	
Spyros Traiforos, ISL	
Ben Gitnick, ISL	

July 1, 2002, Conference Call

NRC Attendees	Florida Power and Light Company Attendees
Noel Dudley	Steve Hale
Ron Young	David Joy
Spyros Traiforos, ISL	Bruce Beisel
Ben Gitnick, ISL	Jack Hoffman
	Greg Hatchett

July 23, 2002, Meeting

NRC Attendees	Florida Power and Light Company Attendees
Noel Dudley	Steve Hale
Ron Young	
Daniel Frumkin	
Steve Jones	
Ben Gitnick, ISL	

MEETING WITH FLORIDA POWER AND LIGHT COMPANY
ST. LUCIE UNITS 1 AND 2
LICENSE RENEWAL APPLICATION
DRAFT REQUESTS FOR ADDITIONAL INFORMATION

JUNE 10-11, 2002

During the June 10-11, 2002, meeting with representatives of Florida Power and Light Company (FPL), the staff clarified the draft requests for additional information (RAIs) it had prepared for the St. Lucie, Unit 1 and 2, license renewal application (LRA). The staff and FPL continued their discussions during a teleconferencing call on June 20, 2002. For some of the draft RAIs, FPL identified where the requested information could be located in the LRA or other docketed documents. The following draft RAIs were resolved during the meeting and will not be issued.

SECTION 2.3 SCOPING AND SCREENING RESULTS – MECHANICAL SYSTEMS

2.2 Plant Level Scoping Results

RAI 2.2-1

Flood protection barriers are addressed in the LRA as part of the structural component intended functions. However, miscellaneous drains are not considered in the scope of license renewal per Table 2.2-1. Based on the plant internal flood analysis, documented in the UFSARs, the staff believes that the drain systems for many of the in-scope structures provide a flood protection barrier that supports the capability to shut down the reactor and maintain it in a safe shutdown condition. Degradation of these systems such as blockage due to foreign material concentration or excessive corrosion, could invalidate the flooding analysis and prevent satisfactory accomplishment of the intended function of safety-related systems. Therefore, major portions of the plant/building drain system should be within the scope of license renewal and subject to an AMR per 10 CFR 54.4(a)(ii).

Examples of flooding analyses which credit the floor drainage system for mitigating the consequences of flooding follow:

St. Lucie Unit 2 moderate energy piping failure analysis, as documented in the UFSAR, includes floor drains in calculating flood height and operator actions. For example, assumption (a) in UFSAR Section 3.6F.2.1 states “Floor drainage system, sump pumps, etc., are considered available to mitigate the flooding consequences of the piping failure.”

Examples of flooding analyses for Unit 2, which take credit for floor drains include:

1. Section 3.6F.2.2.1.(b), page 3.6F-4, discusses flooding in the shutdown cooling heat exchanger room B in the reactor auxiliary building. Credit is taken for a flow of 38.4 gpm through a 3 inch diameter floor drain line to the sump in ECCS compartment A. The fluid level in ECCS compartment A activates an alarm in the control room and subsequent operator actions.
2. Break in the boric acid make-up tank room, page 3.6F-6.
3. Break in the diesel generator building, page 3.6Fa.
4. Break in the component cooling water building, page 3.6F-7.
5. Break in letdown heat exchanger room, page 3.6F-8.
6. Break in the pipe tunnels, Page 3.6F-10.

7. Break in fuel pool heat exchanger room, page 3.6F-11.
8. Break in fuel pool pump room, page 3.6F-12.

Example of flooding analyses for Unit 1, which take credit for floor drains includes the shutdown cooling or LPSI piping, page 3D-9 of Appendix 3D of the UFSAR, “Analysis of High Energy Line Rupture Outside Containment.”

Please include those portions of plant/building drain systems that are credited with protecting safety-related SCs by the plant flooding analysis in the scope of license renewal and subject to an AMR or justify their exclusion.

Resolution: The information requested by the staff is contained in Table 2.2-1 on page 2.2-3 and Table 3.3-16 on page 3.3-89 of the LRA, and the Unit 2 UFSAR Section 11.2.2.3 on page 11.2-6. The miscellaneous drains refer to the extraction steam drains and, as such, are not considered to be within the scope of license renewal. The applicant indicates that the floor drains for potentially radioactive liquid waste are considered to be within the scope of license renewal. The applicant presents the results of the aging management reviews (AMRs) for drain system components in Table 3.3-16.

RAI 2.2-2

Section 6.2.5 of the UFSARs for both units state that systems are provided in accordance with General Design Criterion 41 to control the concentration of hydrogen that may be released into containment following a LOCA. These systems are the containment hydrogen analyzers, the containment hydrogen recombiners and containment hydrogen purge. In LRA table 2.2-1, the hydrogen analyzers are scoped as part of the containment post-accident monitoring system, and the hydrogen purge system is scoped as part of the containment isolation system. However, Table 2.2-1 does not list the hydrogen recombiners. LRA Table 4.1-1 and Section 4.4.1.48 reference TLAAs for the hydrogen recombiners. Clarify whether the hydrogen recombiners are in the scope of license renewal. If so, please state whether any enclosures and/or supports for the hydrogen recombiners are also in the scope of license renewal and subject to an AMR. If not, please justify their exclusion.

Resolution: The information requested by the staff is contained in Section 4.4.1.48 on page 4.4-55 of the LRA and in Unit 2 UFSAR Section 6.2.5.2.2 on page 6.2-64. The hydrogen recombiners are fixed systems inside containment. Each recombiner consists of a thermally vertical metal duct with resistance metal sheathed heaters provided to heat a continuous flow of containment air. The recombiner is provided with an outer enclosure to provide protection from water spray coming from the containment spray system. The recombiner consists of an inlet preheater section, a heater-recombination section, a mixing chamber, and a cooling/exhaust section. The recombiners are qualified for the period of extended operation based on the projected environmental qualification analysis to the end of the period of extended operation per the provisions of 10 CFR 54.21(c)(1)(ii). The scoping results for the hydrogen recombiners are contained in Table 2.2-3 on page 2.2-6 of the LRA under the system name “Miscellaneous (including EQ commodities).”

RAI 2.2-3

The staff is unable to find descriptions in the UFSARs of the following systems that are listed as not being in the scope of license renewal in Tables 2.2-1 and 2.2-2: As such, the staff are unable to determine, with a reasonable assurance, that these systems do not have intended functions that meet the criteria of 10 CFR 54.4.

Mechanical Systems (Table 2.2-1)

- Air blower
- Sluice water

Structures (Table 2.2-2)

- Inlet velocity caps

Please provide a reference to the UFSAR section which describe these systems. If these systems are not described in the UFSAR for either unit, provide a summary description of their intended function.

Resolution: The information requested by the staff concerning inlet velocity caps is contained in Unit 1 UFSAR Section 9.2.3.2 on page 9.2-19. Circulating water is taken from the ocean through three prestressed concrete pipes. Each pipe has a "velocity cap" to minimize fish entrapment. There is about 8 feet of water above each cap and the velocity of intake water is about ½ foot per second. The staff issued RAI 2.2-1 concerning the air blower and the sluice water.

2.3 System Scoping and Screening Results – Mechanical Systems

RAI 2.3.2.1-3

LRA Table 3.2-1 lists the following components/commodity groups as being applicable to Unit 1 only:

- containment fan cooler housings,
- containment fan cooler motor heat exchanger tubes,
- containment fan cooler motor heat exchanger headers, and
- valves.

Please include these components or their equivalents in Table 3.2-1 for Unit 2, or explain why these components are not in the scope of license renewal and subject to an AMR for Unit 2.

Resolution: The information requested by the staff is contained in Unit 1 UFSAR Section 6.2.2.2.2 on page 6.2-50 and Unit 2 UFSAR Section 6.2.2.2.2 on page 6.2-35. Units 1 and 2 have different designs for cooling the fan motors. Unit 1 uses a water cooling system, while Unit 2 uses an air cooling system

Unit 1: The fans are centrifugal type, direct-driven, with backwardly curved airfoil blades to provide a non-overloading characteristic. Fan motors are totally enclosed, fan-cooled type with integrally mounted air-to-water heat exchanger to form an entirely enclosed cooling system. Cooling water to the fan motors is supplied from the same component cooling water line supplying the fan-coil unit.

Unit 2: The fans are axial type, direct motor driven, with air foil adjustable blades. The motors are totally enclosed air-over type, therefore the fan bearings do not contact the air stream.

RAI 2.3.3.2-1

LRA Table 3.3-2 lists the component cooling water system components/commodity groups in the scope of license renewal and subject to an AMR. Metal components of the Unit 2 sight glasses are identified as being exposed to two internal environments, "Treated water- other" and "Air/Gas." However, the glass components of the Unit 2 sight glasses are listed as being exposed to "Treated water- other" only. Please explain why the glass components of the Unit 2 sight glasses are not also exposed to an "Air/Gas" internal environment.

Disposition: This RAI concerns information related to the AMR of component cooling water system components. The RAI was provided to the staff reviewers responsible for the AMR of the component cooling water system for their consideration.

RAI 2.3.3.2-3

Section 9.2.2.3.3 of the St. Lucie Unit 1 UFSAR states that the component cooling water pumps and a portion of the system valves are located outdoors and are designed to operate in environments that include torrential rains and hurricane winds. As shown on license renewal drawing 1-CCW-01, component cooling pumps 1A, 1B, and 1C, and motor-operated valves MV-14-1, MV-14-2, MV-14-3, and MV-14-4 are located outdoors in the component cooling area. The motor housings associated with these components perform a passive intended function by protecting the motors from environmental effects. Although 10 CFR 54.21(a) excludes motors from license renewal scope, the statements of consideration (60 FR 22477, May 8, 1995) state that components that perform their intended function without a change in configuration or properties and that cannot be readily monitored for the effects of aging degradation, even if they constitute part of a component that performs an active function, would be subject to consideration for an aging management review. Therefore, the motor housings that protect the safety-related components identified above should be subject to an aging management review. Please include those components within the scope of license renewal or justify their exclusion.

Disposition: The staff will not issue this draft RAI. Regulation 10 CFR 54.21(a)(1)(i) states that motors are excluded from an AMR. The staff may develop interim staff guidance concerning an AMR for motor housings that provide protection against an outdoor environment.

RAI 2.3.3.3-1

Please clarify the intended support function of the Unit 2 demineralized makeup water system that led to your determination that a portion of the piping for this system is in the scope of license renewal. Please confirm that the Unit 1 demineralized makeup water system piping does not perform a similar intended function.

Resolution: The information requested by the staff is in Unit 2 UFSAR Section 9.2.3.3.3 on page 9.2-13 and in the applicant's draft response to RAI 2.1 - 1 concerning the piping II over I evaluation. The demineralized makeup water system performs no safety related function. In Unit 2, demineralized makeup water system piping is routed through the emergency diesel generator building and is considered to be within the scope of license renewal. The applicant indicates in its response to RAI 2.1 -1 that portions of the demineralized makeup water system will be included within the scope of license renewal on the basis of its II over I reevaluation.

2.3.3.4 Diesel Generator and Support System

RAI 2.3.3.4-1

LRA Table 3.3-4 does not list the following diesel generator and support system components and their housings, although the license renewal drawings identified below identify them as being in the scope of license renewal. These staff believes that these components are passive and long-lived, and therefore should be subject to an AMR. Revise Table 3.3-4 to include these components/housings and their intended functions, or justify their exclusion from the scope of license renewal and being subject to an AMR.

Fuel oil system components and housing omitted are:

- Duplex strainer at locations B4 of drawings 1-EDG-03 and 1-EDG-06 and G4 of drawings 1-EDG-02 and 1-EDG-05,

- Unidentified symbol (shaded square) at locations B4 of drawings 2-EDG–02 and 2-EDG-05 and G3 of drawings 2-EDG-03 and 2-EDG-06,

Lube oil system components and housing omitted are:

- Immersion heaters at locations C3 of drawings 1-EDG-02 and 1-EDG-05, E5 of drawings 1-EDG-03 and 1-EDG-06, D6 and E5 of drawings 2-EDG-02 and 2-EDG-05, and D3 and E2 of drawings 2-EDG-03 and 2-EDG-06,

- Y-strainers and a lube oil strainer at locations B4 and D5 of drawings 1-EDG-02 and 1-EDG-05, D3 and G4 of drawings 1-EDG-03 and 1-EDG-06, D3 and H3 of drawings 2-EDG-02 and 2-EDG-05, and C3 and E4 of drawings 2-EDG-03 and 2-EDG-06.

Resolution: The information requested by the staff concerning the unidentified symbol is contained on license renewal boundary drawing 1-NOTES-01. The unidentified symbol indicates a flame arrestor. The duplex strainer is used for plant startup only. The applicant has removed the strainer media and considers the filter body as a housing. The staff issued the other three bullets as RAI 2.3.3 -2.

RAI 2.3.3.4-2

License renewal drawings 1-EDG-01 (locations B4, C4, D4) and 2-EDG-01 (locations B4 and D4), show guard pipes surrounding the two inch diameter fuel oil lines that connect the diesel oil storage tank building with the diesel generator buildings. A note is provided that states that the guard pipes are not within the scope of license renewal.

However, the staff believes that these guard pipes should be in the scope of license renewal and subject to an AMR for the following reasons:

- Section 9.5.4.3 of the Unit 1 UFSAR, states that "pumps, tanks and other equipment in the system are designed for seismic Class I service...", "The diesel oil transfer pumps, valves, piping, and restraints as well as the fuel storage tanks are designed to withstand design basis tornado winds of 360 mph coincident with the atmospheric pressure drop of 3 psi in 3 seconds..." and "...both the above ground and underground portions of the lines are protected from design basis tornado missiles in accordance with the requirements of FSAR section 8.5."

- Section 9.5.4.3 of the Unit 2 UFSAR, states that the buried piping between the Diesel Oil Storage Tank and the Day Tanks is "encased within a three inch guard pipe. The guard pipe is also coated with a corrosion resistant coating and is also cathodically protected."

Based on the UFSAR information provided above, the intended function of the guard pipes is to protect the diesel fuel oil lines from natural phenomena such as seismic events, high winds and tornado missiles. Failure of the guard pipes could prevent satisfactory accomplishment of the safety-related diesel generator function; the guard pipes therefore fall under the criteria of 10 CFR 50.54(a)(2). Please revise Table 3.3-4 and license renewal drawings 1-EDG-01 and 2-EDG-01 to show the guard pipes as being in the scope renewal and subject to an AMR, or justify the exclusion of the guard pipes in question.

Resolution: The information requested by the staff is contained in Unit 1 UFSAR Section 3.5.4 and Appendix 3F and on license renewal boundary drawing 1-EDG-01. The guard pipes are buried underground. The function of the guard pipes is for corrosion protection and to collect any oil that leaks out of the fuel pipes. The applicant's review of the capability of equipment not enclosed in protected structures to accommodate tornado-generated missiles, did not identify the fuel oil guard pipes as one of the exposed safety-related components.

RAI 2.3.3.4-3

In Section 9.5.5.2 of the Unit 2 UFSAR, reference is made to an aftercooler and individual engine pipe manifold which are supplied by a portion of the cooling water system. The staff believes that these components perform a pressure boundary intended function and should be listed in Table 3.3-4 as being in the scope renewal and subject to an AMR. Please revise Table 3.3-4 to show these components as being in the scope of license renewal and subject to an AMR, or justify their exclusion. If Unit 1 has similar components, include them in Table 3.3-4 as well or justify their exclusion.

Resolution: The information requested by the staff is contained in Unit 2 USFAR Section 9.5-9. The applicant describes the aftercooler and the individual engine pipe manifold in section 9.5.5, "Diesel Engine Cooling Water System," of the Unit 2 USFAR. The engine-mounted piping is designed, fabricated, and installed by the engine manufacturer. The aftercooler and the pipe manifold are bolted to the diesel generator and are treated as piece parts.

RAI 2.3.3.4-4

With regard to the treatment of the vendor-supplied EDG skid-mounted equipment, the staff's position is that components that perform a passive function and are also long-lived must be subject to an AMR whether they are skid-mounted or not. Please provide a P & ID diagram to clearly identify the EDG evaluation boundaries to ensure that all the long-lived components with a passive function on the EDG skid are subject to an AMR. If a component is not subject to an AMR, please provide detailed justifications for its exclusion.

Resolution: On the basis of equipment listed in Table 3.3-4 of the LRA, the staff determined that the applicant did not use skid mounted assemblies. The components of each support system are shown on the license renewal boundary drawings.

2.3.3.5 Emergency Cooling Canal

RAI 2.3.3.5-1

Section 3.8.1.1.5 of the St. Lucie Unit 1 UFSAR states that the function of the emergency cooling canal dam is to separate the waters of the emergency cooling source from the intake canal during normal operation and, through valved opening, to provide the shutdown cooling water requirements in the unlikely event the ocean intake becomes unavailable. As shown on license renewal drawing 1-ICW-02, safety-related (design class "C") air supply piping leads from butterfly valves SB-37-1 and SB-37-2 (locations B6, B7), through valves V37223 and V37225 (locations A5, A6) to solenoid valves SE-37-1 and SE-37-2 (location A6). A branch of this piping runs to locked closed valves V37226 and V37227 (locations B6, B7). Failure of this piping or valves would open the butterfly valves and let water from Big Mud Creek (via the emergency cooling canal dam) flow into the intake canal during normal operation. Please clarify whether failure of this piping and components could degrade or result in the failure of the in-scope emergency cooling canal system to perform its intended function. For example, fouling or blockage could result from entrainment of debris while providing higher-than-design flow during normal operation of the circulating water system.

Resolution: The information requested by the staff is located in Section 2.4.2.9 on page 2.4-12 of the LRA. The emergency cooling canal and the portion of the intake canal between the emergency cooling canal and the intake structure are in the scope of license renewal because they:

- Provide a source of cooling water for plant shutdown
- Provide structural support and/or shelter to components required for fire protection

The closure of the butterfly valves during normal operations to separate the waters of the emergency cooling source from the intake canal during normal operation is not an intended function. The butterfly valves are designed to fail open. Loss of air to the butterfly valves would result in the valves opening and performing their intended function of providing a source of cooling water for plant shutdown. Therefore, the air system does not provide any intended safety function and is considered to be outside the scope of license renewal.

2.3.3.6 Fire Protection

RAI 2.3.3.6-1

LRA Section 2.3.3.6 lists sprinkler heads as components requiring an aging management review. Table 3.3-2 identifies the material for sprinkler head components as a copper alloy. Appendix 9.5A of the UFSAR for both units states that the plant fire protection systems for St. Lucie have closed head sprinklers. Closed head sprinklers have a fusible element which may be subject to aging effects. These fusible elements are typically made from a eutectic mixture of metals which may be subject to aging effects. Verify that the proper materials were considered for closed head fusible elements in the scoping and screening process and identify the basis for stating they have no aging effects and need not be included in any program/activity.

Resolution: Fusible elements are active components and, therefore, are not within the scope of license renewal. The sprinkler head is considered a long-lived, passive component and will be tested in accordance with National Fire Protection Association (NFPA) 25 requirements. The staff issued RAI B.3.2.8-6 concerning the NFPA 25 testing frequency for the sprinkler heads.

RAI 2.3.3.6-2

Appendix 9.5A of the UFSAR for each unit identifies fire detection devices including fixed temperature detectors. LRA Section 2.3.3.6 states that fire detection is included in the electrical/I&C screening. LRA Table 2.5-1 lists alarm units including fire detectors as a commodity group and also sensors as a commodity group, however, the text of Section 2.5.4 addresses only cables and connectors not included in the Environmental Qualifications Program as needing aging management review. Non-restorable thermal detectors may be subject to aging effects which could prohibit them from performing their intended function. If any thermal detectors are non-restorable and therefore not testable, provide the basis for screening them out of an aging management program. (See NFPA 72, National Fire Alarm Code for requirements for testing of non-restorable thermal devices.)

Resolution: The information requested by the staff is contained in Section 2.1.3.2.1 on page 2.1-9 and Table 2.1-5 on page 2.1-19 of NUREG-1800, “Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants,” issued July 2001. Fire protection devices are part of the commodity group “Alarm Units.” These components do not meet the requirements of 10 CFR 54.21(a)(1)(i) and are not within the scope of license renewal.

RAI 2.3.3.6-3

Table 3.3-6 includes nozzles which are part of pressure boundaries, which would be assumed to be closed sprinkler heads. Some nozzles are not closed, such as deluge system nozzles and Halon 1301 nozzles. Verify that these open head nozzles are within the scope of the LRA.

Resolution: The information requested by the staff is contained in Table 3.3-6 on pages 3.3-43 and 3.3-46 of the LRA. The applicant performed an aging management review for sprinkler heads, nozzles, and hose station nozzles in air/gas, outdoor, and indoor - not air conditioned environments. Fire sprinkler head nozzles are considered to be within the scope of license renewal. Sprinklers in raw water environments do not have nozzles and are considered to be outside the scope of license renewal.

2.3.3.7 Fuel Pool Cooling

RAI 2.3.3.7-1

Section 9.1.3.2 of the St. Lucie Unit 1 Updated Final Safety Analysis Report (UFSAR), and 9.1.3.2.1 of the St. Lucie Unit 2 UFSAR, state that the cooled fuel pool water is returned to the bottom of the fuel pool via a distribution header. In locations G4 of drawing 1-SFP-01 and H4 of drawing 2-SFP-01, the distribution header (or sparger) is shown to be within the scope of license renewal. However, LRA Table 3.3.7 does not identify this component as being in the scope of license renewal and subject to an AMR. This distribution header is both passive and long-lived; therefore the staff believes that this component should be subject to an AMR. Please revise Table 3.3-7 to show this component as being in the scope renewal and subject to an AMR, or justify its exclusion.

Resolution: The information requested by the staff is contained in Table 3.3-7 on page 3.3-49 of the LRA. The applicant states that the distribution header is included in the Component/Commodity Group "piping/fittings."

2.3.3.9 Intake Cooling Water

RAI 2.3.3.9-2

Two interconnections to the circulating water pumps are shown on license renewal drawings 1-ICW-01 at locations F5 and F7 for Unit 1. The license renewal boundaries between the in-scope intake water system and the out-of-scope circulating water system are at orifices SO-21-5A and SO-21-5B and do not form a closed pressure boundary. Please justify these open license renewal boundaries.

Resolution: The information requested by the staff is contained in the Unit 1 UFSAR section 3.2.1.1 on page 3.2-2 and 3.2-3. In this section the applicant states:

> All interfaces between non-seismic and seismic Category I Systems are depicted on the P & I Diagram for all systems including those interfaces specifically questioned. The interfaces have been amplified for clarity. The method of protection at the interface is evident from inspection of the diagram. For clarification, some examples of interfaces of main streams are discussed below:
>
> - Lubricating water line to circulating water pumps - Orifices SO-21-5A and 5B provide the boundary between the safety related ICW header and the non-safety related Circulating Water Pump lube water lines.

RAI 2.3.3.9-3

License renewal drawings 1-ICW-01 and 2-ICW-01 show valves I-MV-21-2 and 3 at locations F4 and H4. These valves isolate the portion of the intake cooling water system that is in the scope of license renewal from the turbine cooling water heat exchangers and the steam generator open blowdown cooling system heat exchangers that are not within the scope of license renewal. Section 9.2.1.3.4 of the St. Lucie Unit 1 UFSAR states, "Isolation valves I-MV-21-2 and 3 are powered by motor operators with weatherproof enclosures and are thus suitable for outdoor service. The valves are located in the valve pit adjacent to the pump structure..."

Based on this description provided in the UFSAR, the staff believes that these enclosures should be included in the scope of license renewal and be subject to an AMR. However, waterproof valve operator enclosures are not listed in Table 3.3-9. As such, the staff is unable to verify that these valve operator enclosures have been included in the scope of license

renewal. Please identify the components/component groups which comprises these components or justify their exclusion.

Disposition: The staff will not issue this draft RAI. Regulation 10 CFR 54.21(a)(1)(i) states that motors are excluded from an AMR. The staff may develop interim staff guidance concerning an AMR for motor housings that provide protection against an outdoor environment.

RAI 2.3.3.9-4

GDC 44, "Cooling Water," requires, in part, that suitable redundancy in features for cooling water systems be provided. GDC 2, "Design Bases for Protection Against Natural Phenomena," requires, in part, that SSCs important to safety be designed to withstand the effects of natural phenomena without loss of capability to perform their safety function. Regulatory position C.2 of Regulatory Guide 1.27 requires that the ultimate heat sink should be capable of withstanding the most severe natural phenomena expected at the site, or a single failure of manmade structural features.

As shown in license renewal drawings 1-ICW-01 and 2-ICW-01at locations A6-A7 for both St. Lucie units, the intake cooling water discharges into the discharge canal through twin 30 inch lines. The UFSAR for Unit 1, Section 9.2.7.3 states that to preclude blockage of the discharge canal flow (by soil liquefaction), the discharge piping was designed with an open stand pipe (elevation +13.75 ft) which will discharge water above the liquefaction level. However, the staff was unable to determine, with a reasonable assurance, that these stand pipes were in the scope of license renewal and subject to an AMR based on the information presented in Table 3.3-9 and license renewal drawings 1-ICW-01 and 2-ICW-01. Please verify that the stand pipes are in the scope of license renewal and subject to an AMR for both St. Lucie units, or justify their exclusion.

Resolution: The information requested by the staff is contained in Table 3.3-9 on pages 3.3-59 and 3.3-63 of the LRA and on license renewal boundary drawings 1-ICW-01 and 2-ICW-01. The applicant indicates the open stand pipes are within the scope of license renewal and were subjected to an AMR.

2.3.3.11 Primary Makeup Water System

RAI 2.3.3.11-1a

Table 3.3-11 of the LRA states that a vortex breaker (Unit 2 only) is included within the scope of license renewal serving a vortex prevention intended function. Presumably the vortex breaker is in the 150,000 gallon Primary Water Storage Tank (License renewal drawing 2-PW-01 (location B3). However, no vortex breaker is shown on drawing 2-PW-01. Please clarify the location of the vortex breaker listed in Table 3.3-11.

Resolution: The information requested by the staff is on license renewal boundary drawing 2-PW-01. The vortex breaker is shown above the top of the drain pipe that extends into the primary cooling water storage tank. The symbol for the vortex breaker is not included on the General Notes and Legion for the boundary drawings.

RAI 2.3.3.11-1b

License renewal drawing 2-PW-01, location A3, shows a floating diaphragm located in the Primary Water Storage Tank. Based on a past history of failed materials becoming resident in water storage facilities at nuclear facilities, the staff believes that pieces of a failed diaphragm could enter the tank and prevent the vortex breaker from performing its intended function and may also limit the availability of water for fire protection purposes by clogging the vortex breaker and/or the system piping. Please revise Table 3.3-11 to show that the floating diaphragm is in the scope of license renewal and subject to an AMR, or justify its exclusion.

Resolution: The information requested by the staff is in Unit 2 UFSAR Section 9.2.3.1.2 on page 9.2-11. The use of a metal diaphragm in the primary water storage tank helps to prevent aeration of the water.

RAI 2.3.3.11-1c

License renewal drawing 2-PW-01, location B3, shows a manway on the primary water storage tank (drawing 2-PW-01, location B3). The seals and cover for this manway are not listed in Table 3.3-11 as being in the scope of license renewal and subject to an AMR. The staff believes that these items perform a pressure boundary function and, as such, are within the scope of license renewal. Please revise Table 3.3-11 to show that the manway cover and seals are in the scope of license renewal and subject to an AMR, or justify their exclusion.

Resolution: The information requested by the staff is contained in Table 3.3-11 on page 3.3-69 and in Appendix C on page C-16 of the LRA. The applicant indicates that loss of mechanical closure integrity is an aging effect associated with bolted mechanical closures that result in failure of the mechanical joint. The manways are evaluated under the AMR for bolting (mechanical closures).

2.3.3.12 Sampling

RAI 2.3.3.12-1a

UFSAR Sections 9.3.2.2.1, page 9.3-9 (Unit-1) and 9.3.2.2.1, page 9.3-7 (Unit-2) state that when shutdown cooling is in operation, samples are taken directly from the LPSI pump discharge header. During the recirculation period following a LOCA, samples are taken from the minflow sample points. The safe shutdown function includes the capability to provide for process monitoring. Obtaining samples to check boron concentration of the water is an essential function necessary to assure maintaining a safe shutdown condition. License renewal drawings 1-SAMP-01 (location E3) and 2-SAMP-01 (location D3) indicate that piping, valves and heat exchangers beyond the normally closed isolation valves for these sample flow paths are not within the scope of license renewal. When samples are taken from either location, the piping, valves and sample heat exchangers associated with these sample flow paths serve a pressure boundary function and therefore are within the scope of license renewal. Please revise Table 3.3-12 and the referenced license renewal drawings to indicate that the subject portions of the sampling systems are in the scope of license renewal and subject to an AMR, or justify their exclusion.

Resolution: The information requested by the staff is contained on license renewal boundary drawings 1-SAMP-01 and 2-SAMP-01. As indicated on the drawings, the safety class code breaks for the piping are at the first sample line isolation valves inside the sample room. The sample lines from the low pressure safety injection pump perform no safety related functions and are not credited as part of the post accident sampling system.

RAI 2.3.3.12-1b

License renewal drawings, 1-SI-02, e.g. location A2 and 2-SI-02, e.g. location A7 show piping to the containment drain header. This piping is shown as not within the scope of license renewal. Since the piping shown on the drawings is in the reactor building and the reactor auxiliary building, it appears that the piping penetrates the containment in order to reach the containment drain tanks. The portion of the piping between the inboard and outboard isolation valves serves as the containment pressure boundary, and therefore is within the scope of license renewal. Please revise drawings 1-SI-02 and 2-SI-02 and the appropriate Tables in the LRA to indicate that the subject piping and valve body components are in the scope of license renewal and subject to an AMR, or justify their exclusion.

Resolution: The information requested by the staff is contained on license renewal boundary drawings 1-WM-01and 2-WM-01. The applicant indicates that the portions of the reactor drain system that penetrate the containment wall are within the scope of license renewal. The portions of the reactor drain system inside the containment between isolation valve V3361 and the reactor drain tank in Units 1 and 2 are outside the scope of license renewal and not subject to an AMR.

2.3.3.15 Ventilation

RAI 2.3.3.15-3

Section 9.4.1 of the Unit 1 UFSAR states that the control room ventilation system is designed to maintain the ambient temperature for personnel comfort during normal conditions only, whereas the Unit 2 UFSAR states the control room ventilation system is designed to control the environment in the control room envelope, for the comfort of control room personnel and to assure the operability of control components during normal plant operation, anticipated operational occurrences or abnormal occurrences.

Both St. Lucie units are credited with the ability to cope with a station blackout (SBO) event for a minimum of four hours. The Unit 1 UFSAR, Section 15.2.13, presents a SBO analysis that demonstrates that continuous operator action will be required during the first three and one half hours of the four hour coping period. However, UFSAR Section 9.4.1.2 states that “a maximum control room air temperature of 125 ^{o}F could be reached 54 minutes after the loss of the air conditioning chiller units, a temperature at which continued habitability for periods of 2 hours is permissible.”

The staff is concerned that the St. Lucie Unit 1 control room may not be continuously habitable for the duration of an SBO event, as required by GDC 19 of 10 CFR 50, Appendix A. Section 9.4.1.2 of the Unit 1 UFSAR states, “Through judicious allocation of plant operating personnel it will be possible to maintain continuous occupancy of the control room. In addition the operator can bring the plant to safe shutdown from outside the control room.” Justify the exclusion of the Unit 1 components required to maintain the MCRE habitable during the SBO coping period or add these components to LRA Table 3.3-15. Justification provided should include the criteria and procedures to be used to allocate control room personnel during an extended SBO event.

Disposition: The concern that the control room many not be continuously habitable during a station blackout event is an operating plant issue. Therefore, this draft RAI was forwarded for consideration to the NRC Project manager for St. Lucie, the Chief of the human factors section, and the chief for the electrical section.

RAI 2.3.3.15-10

According to the LRA, the Unit 1 intake structure ventilation system is not in the scope of license renewal. Confirm that the Unit 1 intake cooling water pumps do not require forced ventilation to perform their safety-related function or include these SCs in the scope of the license renewal and subject to an AMR in accordance with the 10 CFR 54.4(a)(2) and 10 CFR 54.21(a)(1) or justify their exclusion.

Resolution: The information requested by the staff is contained on page 9.2-3 of the Unit 1 USFAR. The Unit 1 intake cooling water pumps are located outdoors and designed for outdoor service. No ventilation system is required. The applicant describes the hurricane protection structures provided for the pumps in Appendix 3F of the Unit 1 USFAR on page 3F-10.

DISPOSITION OF NINE DRAFT RAIs CONCERNING VENTILATION SYSTEMS

There are nine draft RAIs that concern AMRs for ventilation systems. These nine draft RAIs were combined into the following three RAIs that were issued to the applicant.

RAI 2.3.3.15 - 1: Requests justification why fan and damper housings are considered to be outside the scope of license renewal.

RAI 2.3.3.15 - 2: Requests either the replacement periodicity or the performance standards and criteria used to exclude filter media from the an AMR.

RAI 2.3.3.15 - 3: Requests justification for why specific components were excluded from an AMR.

The following draft RAIs will not be issued since they were combined in RAIs 2.3.3.15 - 1, 2, and/or 3.

RAI 2.3.3.15-4

LRA Table 3.3-15 does not identify the components and/or housings listed below, although these components and/or housings support the intended function of the control room ventilation system to comply with the requirements of the Appendix A to 10 CFR Part 50, GDC 19. These components are shown on LRA Drawings 1-HVAC-02, Rev. 0, and 2-HVAC-02, Rev. 0, as being within the scope of license renewal. Include these components in LRA Table 3.3-15 or justify the exclusion of these components and/or housings from the scope of license renewal and subject to an AMR:

Unit 1 on LRA Drawing 1-HVAC-02, Rev. 0

- Direct expansion cooling coils and coil housings for in door HVAC units HVAC-3A, 3B and 3C, at locations A7, B7, C7.,
- Filter media and filter housings (HVAC units HVAC-3A, 3B and 3C), at locations A7, B7, C7.,
- High efficiency particulate air (HEPA) filter(s) and filter housings and charcoal absorbers and charcoal absorbers housings (for HVAC units HVE-13A, 13B) at locations B5.,
- Housings for dampers D-17 at location B5, D-18 at location B6, D-19 at location C6, GD-5 at location B6, GD-6 at location C6, D20 at location A7, D-21 at location B7, D22 at location C7, GD-7 at location A8, GD8 at location B8, GD-9 at location C8, D29A at location C4, D29B at location C5, D-41 at location C8, D-42 at location C7, unlabeled at location C8 and D8 .,
- Housings for fans HVE-13A at location B6 and 13B at location C6, HVAC-3A, 3B and 3C at locations A7, B7, C7, respectively, and HVAC-10A and 10B at location D8 .,
- Housings for outdoor air conditioning compressor units ACC-3A, 3B, 3C at locations A7, B7 and C7 .,

- EHC-1 at location D7 and EHC-2 at location D8 and their associated ductwork to serve the technical support center.

- Unit 2 on LRA Drawing 2-HVAC-02, Rev. 0

- Direct expansion cooling coils and coil housings (for HVAC units 2HVA/ACC-3A, 3B and 3C) at locations A5, B5, C5 .,

- Filter media and filter housings (for HVAC units 2HVA/ACC-3A, 3B and 3C) at locations A5, B5, C5.,

- Prefilters, high efficiency particulate air (HEPA) filters and charcoal absorbers and their associated housings (for HVAC units 2HVE-13A, 13B) at locations A4, B4 .,

- Housings for dampers D-17A at location A3, D-17B, D-20, D-21, and D-22 at location C3, D-18 at location A4, D-19 at location B4; GD-5 at location A4 and GD-6 at location B4, unlabeled at locations A5, B5, C5, GD-7 at location A6; GD-8 at location B6; GD-9 at location C6, DPR-25-2 at location A6; DPR-25-4 at location B6, DPR-25-3 at location C6; D39 at location C5 and D40 at location DC5 .,

- Housings for fans 2HVE-13A at locations and A4, 2HVE-13B at location B4; housings for air handling unit fans, 2HVA/ACC-3A at location A6, 2HVA/ACC-3B at location B6, and 2HVA/ACC-3C at location C6.

If the filter media for the components identified above were excluded on the basis that these media components are routinely replaced (consumables), describe the plant-specific monitoring program and the specific performance standards and criteria for periodic replacement.

Disposition: This draft RAI will not be issued. The concerns identified in this draft RAI were incorporated into RAIs 2.3.3.15 - 1, 2, and/or 3, which were issued.

RAI 2.3.3.15-6

The components/housings shown in LRA Drawing 1-HVAC-02, Rev. 0, for Unit 1, at coordinates D-5 and E-5 (downstream of the exhaust fans HVE-9A and HVE-9B) are shown in the scope of license renewal. Include these SCs in LRA Table 3.3-15 as being subject to an AMR in accordance with the 10 CFR 54.4(a)(2) and 10 CFR 54.21(a)(1) or justify their exclusion from an AMR.

Disposition: This draft RAI will not be issued. The concerns identified in this draft RAI were incorporated into RAIs 2.3.3.15 - 1, 2, and/or 3, which were issued.

RAI 2.3.3.15-7

LRA Table 3.3-15 does not list the following components and housings listed below, although these components and housings, support the intended function of the ECCSs area ventilation system. These components are shown on drawing 1-HVAC-02, Rev. 0, and 2-HVAC-02, Rev. 0, as being within the scope of license renewal. Include these components in Table 3.3-15 or

justify their exclusion from the scope of license renewal and being subject to an AMR in accordance with the 10 CFR 54.4(a)(2) and 10 CFR 54.21(a)(1):

Unit 1 LRA Drawing 1-HVAC-02, Rev. 0

- Housings for fans HVS-4A and 4B at locations D2, E2; HVE-9A, 9B, at locations D5 and E5 .

- Housings for dampers L-8 at location E1; GD-3 at location D2; GD-4 at location E2; D-1, D-2 , D-3, D-4 at location D3; D-8A, D-8B at location E3; GD-12 at location E3; D-7A, D-7B at location F3; D-9A, D-9B at location D4; D-12A, D-12B at location E4; D-5A, D-5B at location E4; D-6A, D-6B at location F4; D-13, D-14 at location D4; D-15, D-16 at location E4; L-7A at location D5; L-7B at location E5.

- Media for prefilter(s) at location E1; HEPA filters at locations D4, E4; and charcoal absorbers at locations D5, E5.,

Unit 2 LRA Drawing 2-HVAC-02, Rev. 0:

- Housings for fans 2HVS-4A and 4B at locations D2, E2; 2HVE-9A, 9B, at locations D5 and E5.,

- Housings for dampers: 2L-8 at location E1; unlabeled at locations D2, E2; D-1, D-2, D-3, D-4 at location D3; GD-12 at location E3; D-7B at location F3; unlabeled at location F3 (total 3); D-9A, D-9B at location D4; D-12A, D-12B at location E4; D-13 at location D4; D-15 at location E4; D-14 at location D5; D-16 at location E5; 2L-7A at location D7; 2L-7B at location E7.,

- Media for prefilter(s) at location E1; HEPA filters at locations D5, E5; and charcoal absorbers at locations D5, E5.,

If the filter media for the components identified above for Units 1 and 2 were excluded on the basis that these media components are routinely replaced (consumables), describe the plant-specific monitoring program and the specific performance standards and criteria for periodic replacement.

Disposition: This draft RAI will not be issued. The concerns identified in this draft RAI were incorporated into RAIs 2.3.3.15 - 1, 2, and/or 3, which were issued.

RAI 2.3.3.15-8A

LRA Table 3.3-15 exclude the following components and/or housings listed below, although these components and/or housings, support the intended function of the Unit 2 fuel handling building ventilation system. These components are shown on Drawing 2-HVAC-03, Rev 0, as being within the scope of license renewal. Include these SCs in LRA Table 3.3-15 subject to an AMR in accordance with the 10 CFR 54.4(a)(2) and 10 CFR 54.21(a)(1) or justify their exclusion:

- Housings for dampers D-29, D-30 at location B2; D-33, D-34 at location C2; D-31, D-32 at location B4; D-35, D-36 at location C4.

Disposition: This draft RAI will not be issued. The concerns identified in this draft RAI were incorporated into RAIs 2.3.3.15 - 1, 2, and/or 3, which were issued.

RAI 2.3.3.15-9

LRA Drawing 2-HVAC-01, Rev. 0, shows the intake structure exhaust system for Unit 2 to be within the scope of license renewal. However, the following system components are not included as part of LRA Table 3.3-15 as being in the scope of license renewal and subject to an AMR in accordance with the 10 CFR 54.4(a)(2) and 10 CFR 54.21(a)(1) or justify their exclusion:

- Housings for exhaust fans 2HVE-41A, 41B at location F5.,
- Housings for two unlabeled pressure damper(s) at (location F5).,
- Screened openings (not shown on LRA Drawing 2-HVAC-01, Rev. 0) and associated ductwork (as identified in Section 9.4.6.2 of the Unite 2 UFSAR).

Include the above SCs in the scope of the license renewal and subject to an AMR in accordance with the 10 CFR 54.4(a)(2) and 10 CFR 54.21(a)(1) or justify their exclusion.

Disposition: This draft RAI will not be issued. The concerns identified in this draft RAI were incorporated into RAIs 2.3.3.15 - 1, 2, and/or 3, which were issued.

RAI 2.3.3.15-13

LRA Table 3.3-15 does not identify the components and their housings listed below, although these SCs and their housings, support the intended function of the Unit 1 miscellaneous ventilation system. These SCs are shown on Drawings 1-HVAC-01, Rev.0, and 1-HVAC-02, Rev. 0, as being in the scope of license renewal. Include these components in Table 3.3-15 or justify their exclusion from the scope of license renewal and being subject to an AMR:

- HVAC-10A and HVAC-10B at locations C8 and D8 (1HVAC-02., Rev. 0).
- HVS-9 and HVE-35 at locations E7 and D7 (1-HVAC-01, Rev. 0).,
- Unlabeled damper and its housing, media for the filters and their housings, and a screen for the outside air inlet at locations E7 (1-HVAC-01, Rev. 0).

Include the above SCs in the LRA Table 3.3-15 for being subject to an AMR in accordance with the 10 CFR 54.4(a)(2) and 10 CFR 54.21(a)(1) or justify their exclusion.

If the filter media for the components identified above were excluded on the basis that these media components are routinely replaced (consumables), describe the plant-specific monitoring program and the specific performance standards and criteria for periodic replacement.

Disposition: This draft RAI will not be issued. The concerns identified in this draft RAI were incorporated into RAIs 2.3.3.15 - 1, 2, and/or 3, which were issued.

RAI 2.3.3.15-14

Clarify whether the battery room ventilation air supply at St. Lucie Unit 1 pass through filters and other components as at Unit 2. If so, add these filter media and components to Table 3.3-5 of the LRA, or justify their exclusion. If the filter media identified above was excluded on the basis that these media components are routinely replaced (consumables), describe the plant-specific monitoring program and the specific performance standards and criteria for periodic replacement.

Disposition: This draft RAI will not be issued. The Unit 1 ventilation intake to the battery room comes from the electrical equipment room ventilation system. The path is similar to the Unit 2 path as shown on the license renewal boundary drawings 1-HVAC-01 and 2-HVAC-02. The concerns identified in this draft RAI were incorporated into RAIs 2.3.3.15 - 1, 2, and/or 3, which were issued.

RAI 2.3.3.15-15

LRA Table 3.3-15 does not list the following SCs and/or housings listed below, although these components and/or housings, support the intended function of the electrical and battery room ventilation system. These components are shown on Drawings 1-HVAC-02, Rev. 0, (Unit 1), and 2-HVAC-02, Rev. 0, (Unit 2) as being within the scope of license renewal. Include these components in Table 3.3-15 for being subject to an AMR in accordance with the 10 CFR 54.4(a)(2) and 10 CFR 54.4(a)(2) or justify their exclusion:

Unit 1 LRA Drawing 1-HVAC-02, Rev. 0

- Housings for battery room exhaust fans RV-1, RV-2 at location G3 an unlabeled gravity damper (GD) at location G3.,
- Housings for electrical equipment room fans HVS-5A, HVS-5B at locations G5, H5; RV-3, and RV-4 at locations G5, G6; HVE-11, HVE-12 at locations G6, H6.,
- Housings for electrical equipment room dampers L-11 at location G4; GD-1 and GD-2 at location G5; unlabeled dampers at locations G5, G6; and L-9 and L-10 at locations G6, H6.,
- Media for the filters shown at G4.

If the filter media for the components identified above were excluded on the basis that these media components are routinely replaced (consumables), describe the plant-specific monitoring program and the specific performance standards and criteria for periodic replacement.

Unit 2 LRA Drawing 2-HVAC-02, Rev. 0

- Housings for battery room exhaust fans RV-1, RV-2, RV-3, RV-4 at location H2 and unlabeled pressure damper (GD) at location G2.,
- Housings for electrical equipment room fans 2HVS-5A, 2HVS-5B at locations G3, H3;2 HVE-11, 2HVE-12 at location H4.,

- Housings for electrical equipment room dampers 2L-11 at location G3; GD-1 and GD-2 at locations G3, H3; 2FDPR-25-123 and 2FDPR-25-119 at location G4; GD-19, GD-20 at locations G4, H4.,

- Media for the filter(s) shown at G3.

If the filter media for the components identified above were excluded on the basis that these media components are routinely replaced (consumables), describe the plant-specific monitoring program and the specific performance standards and criteria for periodic replacement.

Disposition: This draft RAI will not be issued. The concerns identified in this draft RAI were incorporated into RAIs 2.3.3.15 - 1, 2, and/or 3, which were issued.

RAI 2.3.3.15-16

LRA Table 3.3-15 does not list the following components and/or housings listed below, although these components and/or housings, support the intended function of the shield building ventilation system. These components are shown on LRA Drawings 1-HVAC-02, Rev. 0, and 2-HVAC-03, Rev. 0, as being within the scope of license renewal. Include these components in Table 3.3-15 or justify their exclusion from the scope of license renewal and being subject to an AMR:

Unit 1 LRA Drawing 1-HVAC-02, , Rev. 0

- Housings for fans HVE-6A, 6B at locations D7, F7.,

- Housings for dampers GD-10 and D-23 at location D7; GD-11 and D-24 at location F7.,

- Electrical coil housings and electrical heating coils EHC-HVE-6BZ and EHC-HVE-6AI at location D6, and EHC-HVE-6AZ and EHC-HVE-6BI at location F6.,

- Demister housings and demister I-V-25-24 at location D6 and unlabeled demister at location F6.,

- Media for the four HEPA filters at locations D7 and F7; two charcoal adsorbers at locations D7, F7.

Unit 2 LRA Drawing 2-HVAC-03, Rev. 0

- Housings for fans 2HVE-6A, 6B at locations D6, F6.,

- Housings for dampers GD-10 at location D6; D-23 at location D7; GD-11 at location F6; D-24 at location F7.,

- Electrical coil housings and electrical heating coils EHC-2HVE-6AI at location D3, and EHC-2HVE-6BZ at location D4, EHC-2HVE-6BI at location F4, and EHC-2HVE-6AZ at location F3.,

- Demister housings and unlabeled demister (two) at location D3 and F3.,

- Media for the four HEPA filters at locations D4, D5, F4 and F5; two charcoal absorbers at locations D5, F5.

If the filter media for the components identified above were excluded on the basis that these media components are routinely replaced (consumables), describe the plant-specific monitoring program and the specific performance standards and criteria for periodic replacement.

Disposition: This draft RAI will not be issued. The concerns identified in this draft RAI were incorporated into RAIs 2.3.3.15 - 1, 2, and/or 3, which were issued.

2.3.4 Main Steam, Auxiliary Steam, and Turbine

RAI 2.3.4.1-2

Section 10.3.1 of the Unit 1 UFSAR and Section 10.3.3 of the Unit 2 UFSAR state that the main steam isolation valves (MSIV) and their actuation system components (i.e., solenoid valves, air accumulators and control devices) are required to perform an isolation function. The MSIV air accumulators have not been included in Table 3.4-1 of the license renewal application as being in the scope of license review and subject to an AMR. [Note: The MSIV air accumulators are shown at locations A2, A3, A6, and A7 of drawing 1-IA-05, and at locations D2 and H2 of drawing 2-MS-03]. Accumulators are included with the instrument air system in Table 3.3-8; however, it is not clear whether that component group includes the MSIV accumulators. Please confirm that the MSIV air accumulators have been included in the LRA as being in the scope of license renewal and subject to an AMR, or justify their exclusion.

Resolution: The information requested by the staff is contained in Table 3.3-8 on page 3.3-54 of the LRA and on license renewal boundary drawings 1-MS-04 and 1-IA-05. On the drawings, the applicant indicates that the accumulators are within scope. In Table 3.3-8, the applicant presents the results of its AMR of the accumulators.

RAI 2.3.4.2-1

In location B5-6 of drawing 2-EDG-02, at the blowdown lines of steam generator 2A, cooling fins [CF-2A2 and CF-2A1] are shown to be within the scope of license renewal. However, these cooling fins are not identified in Table 3.4-2, which lists the components of the main feedwater and steam generator blowdown system that are in the scope of license renewal and subject to an AMR. Please include these cooling fins and their intended function in Table 3.4-2, or justify their exclusion.

Cooling fins are not depicted on the blowdown line from steam generator 2B, nor are they depicted on the blowdown lines for the Unit 1 steam generators. Section 10.4.8.2 of the Unit 2 UFSAR does not describe these cooling fins nor their intended function. Please confirm that cooling fins do not exist on other steam generator blowdown lines.

Resolution: The information requested by the staff is contained in Section 10.4.8.3 on page 10.4-18 of the Unit 2 UFSAR and on license renewal drawing 1-NOTES-01. The steam generator blowdown system has no safety-related functions with the exception of containment isolation. The piping is within the scope of license renewal and was subjected to an AMR. The cooling fins on the blowdown piping are not part of the pressure boundary, have no safety function, and are outside the scope of license renewal.

RAI 2.3.4.3-2

The LRA identified vortex breakers in Table 3.4-3 as being in the scope of license renewal and subject to an AMR; however, the drawing legend sheet does not identify the symbol for vortex breakers. Therefore, these components could not be located on the various drawings. Please identify the drawing and location of the vortex breakers and confirm that these components are in the scope of license renewal.

Resolution: The information requested by the staff is located on license renewal boundary drawing 2-PW-01. The vortex breaker is shown on the drawing at location B3 to be within the scope of license renewal. The symbol used for the vortex breaker is not identified in the General Notes and Legend of the license renewal drawings.

RAI 2.3.4.3-3

LRA Table 3.4-3 identifies an auxiliary feedwater lube oil tank, pump and cooler that supplies lubricating oil to the Unit 2 turbine driven auxiliary feedwater pump. However, these components could not be located on drawings 2-AFW-01 and 2-AFW-02 referenced in LRA Table 2.3-4 as showing the components of the auxiliary feedwater system. Please identify the drawing and location of these components and confirm that these components are in the scope of license renewal.

Resolution: The components listed in Table 3.4-3 are considered to be within the scope of license renewal and have been subjected to an AMR. License renewal boundary drawings 1-AFW-02 and 2-AFW-02 identify the auxiliary feedwater pump turbines and the associated drain systems. However, the drawings do not identify the non-safety related systems, such as the lube oil system, whose failure could prevent the satisfactory accomplishment of a safety function.

SECTION 2.4 SCOPING AND SCREENING RESULTS - STRUCTURES

2.4.2 Other Structures

RAI 2.4.2.1-1

License renewal drawing 2-FP-01 (at locations H4, H5) highlights all of the components in the flow path from the yard sump to the component cooling area sump for Unit 2. However, the component cooling area sump is not listed in Table 3.5-3, which identifies the components of the component cooling area that are in the scope of license renewal and subject to an AMR. Justify its exclusion.

Resolution: The information requested by the staff is contained in Table 3.5-16 on page 3.5-93 of the LRA. The component cooling area sump is a recess in the foundation slab that is identified as a reinforced concrete pipe trench on page 3.5-93.

RAI 2.4.2.2-1

The condensate polisher building is discussed in LRA Section 2.4.2.2. There is only one condensate polisher building because the condensate polisher filter demineralizer system is shared by both units (as stated in Unit 1 UFSAR Section 1.2-6, page 1.2-23, and Unit 2 UFSAR

Section 1.2-4, page 1.2-14). LRA Section 2.4.2.2 references the Unit 1 UFSAR Appendix 9.5A, Section 4, as the description for this building. However, the description provided in Section 4 only identifies the fire areas in this building.

The staff is therefore unable to determine, with a reasonable assurance, that all components/commodity groups of the condensate polisher building within the scope of license renewal have been identified in LRA Table 3.5-4. Please describe this structure and its components, or provide a reference that describes the condensate polisher building.

Disposition: This draft RAI will not be issued. This draft RAI will be provided to the Scoping Inspection Team to incorporate into its inspection plan.

RAI 2.4.2.3-1

Section 2.4.2.3 of the LRA states that "The steel condensate storage tanks are bolted to reinforced concrete ring wall pedestals that are supported on the base mats. The tank bottoms are supported on Class 1 structural fill that is enclosed within the concrete ring walls." A list of condensate storage tank enclosure components/commodity groups within the scope of license renewal is provided in LRA Table 3.5-5. The only concrete listed in this table is "Reinforced concrete above groundwater". Bolts, base mats and structural fills are not identified in Table 3.5-5. Justify their exclusion.

Resolution: The information requested by the staff is contained in Section 3.5.2.3 on page 3.5-24 and in Table 3.5-5 on page 3.5-53 of the LRA. Reinforcing steel and embedded steel are evaluated with the concrete components in which they are embedded. The base mats are concrete. The bolts, concrete, and base mats are included in Table 3.5-5 as part of the commodity group "reinforced concrete above groundwater." Structure fills consists of dirt and there is no identified aging mechanism for dirt.

RAI 2.4.2.5-1

LRA Section 2.4.2.5 states that the emergency diesel generator buildings are in the scope of license renewal because, among the many functions, they provide flood protection barriers. In Table 3.5-7, the intended function of flood protection barriers is assigned to (a) reinforced concrete above ground, and (b) missile protection doors.

In regards to reinforced concrete, trenches are included in Table 3.5-7 as one of the means of flood protection. However, curbs are not included in Table 3.5-7. Such curbs are shown for Unit 2 in General Arrangement Drawing 2998-G-077 at locations (16,F) and (18,F). Please indicate whether the function of these curbs is flood protection in which case they should be included in Table 3.5-7.

In regards to missile protection doors, these are shown for Unit 2 in General Arrangement Drawing 2998-G-077 at locations (18,K) and (18,E) as well as (16,K) and (16,E). Please explain how they function for flood protection. Any special features of these doors that serve for flood protection, (such as gaskets) should be listed in Table 3.5-7.

Resolution: The information requested by the staff is contained in Unit 1 UFSAR Section 3.4.1 on pages 3.4-3 and 3.4-4 and Unit 2 UFSAR Section 3.4.1 on pages 3.4-2 and 3.4-4. The elevation of the emergency diesel generator buildings provides the required protection from wave runup or wind-driven rain, even during a probable maximum hurricane. Therefore, the

use of gasketed aluminum stop logs and/or sandbags and plastic sheeting is not required. The curbs shown on the drawing are intended to prevent fuel oil spills inside the buildings from reaching the environment.

All permanent door openings in the exterior walls of the emergency diesel generator building are provided with swing type doors for protection from rain, wind, and other atmospheric effects. The access doors may not be provided with weather-stripping in all cases, however, the amount of leakage-induced flooding through these doors is not more adverse than that considered in the analysis presented in Section 3.1.3 of Chapter 9.5A on the rupture of non-seismic Class 1 equipment (fire system piping).

RAI 2.4.6-3

LRA Section 2.4.2.6 discusses fire barriers that provide compartmentalization and containment. Page 9.5A-204 (Exemption E5) of the UFSAR discusses six general types of piping penetrations that have are not rated, yet serve to provide fire separation. Page 9.5A-205 (Exemption E6) of the UFSAR discusses that thickness of steel in the piping (48-inch standard wall pipes and 2-inch schedule 50 pipes) provides protection from fire damage. Degradation of piping penentration assemblies or piping wall thickness due to aging may invalidate these exemptions. Page 9.5A-177, (Exemption C2) of the UFSAR discusses a 1/4 in. minimum steel hatch cover which provides fire resistance between fire areas. Degradation of this hatch cover may invalidate this exemption.

Resolution/Dispositon: The information requested by the staff is contained in Table 3.5-2 on page 3.5-37 and Table 3.5-12 on page 3.5-75 of the LRA. The results of the AMR of piping and spare penetrations (including bellows) are contained in Table 3.5-2. The results of the AMR of steel hatch covers are contained in Table 3.5-12 as part of the commodity group miscellaneous steel (i.e., radiation shielding, missile barriers, hatch frame covers, etc.).

The concern that the basis for these exemptions may be invalidated by the degradation of piping assemblies or piping wall thickness will be provide to the Scoping and Screening Inspection Team for incorporation into its inspection plan.

RAI 2.4.2.9-1

Section 2.4.2.9 of the LRA states that the emergency cooling canal and the portion of the intake canal between the emergency cooling canal and the intake structure are within the scope of license renewal. As seen in Figure 2.2-1 of the LRA, the boundary of the intake canal in scope is not clearly defined. Highlight the portion of the intake canal that is in scope. Explain whether failure of the portion of the intake canal not in scope could affect the minimum cell level of the intake structure when taking water from the emergency cooling water canal.

Resolution: The information requested by the staff is contained in Unit 1 UFSAR Section 9.2.7 on pages 9.2-28 to 9.2-30. The St. Lucie site ultimate heat sink barrier is a seismically capable structure; i.e., it will remain upright during and subsequent to a Design Basis Accident. Appendix 2G of the Unit 1 UFSAR provides the analyses of the underlying soils, verifying their stability. Supplement No. 2 to Appendix 2G indicates which soils have been stabilized.

RAI 2.4.2.10-1

Section 3.8.4.1.5 of the Unit 2 UFSAR states “The intake cooling water pumps are protected from tornado missiles by an enclosure consisting of reinforced concrete walls and structural steel roof extending above the deck to elevation 36.5 ft. A similar structure for missile protection is provided over a portion of the valve pit.“ However, structural steel roofing is not listed as a component/commodity group in Table 3.5-11, which lists the intake structure components in the scope of license renewal and subject to an AMR. Table 3.5-11 does list a miscellaneous steel component/commodity group, however roofing is not listed as a use of this component as was done for the reinforced concrete component/commodity group. Please clarify whether the miscellaneous steel commodity group includes roofing. If the steel roofing is not in the scope of license renewal and subject to an AMR, justify its exclusion.

Resolution: The information requested by the staff is contained in Table 3.5-11 on page 3.5-71 of the LRA. The commodity group structural steel framing (columns, beams, connections, etc.) is consistent with the GALL commodity group III A3.2-a. This commodity group includes steel missile barriers and enclosures at Unit 1 and steel roofing at Unit 2.

RAI 2.4.2.10-2

The Unit 1 UFSAR Section 3.8.1.1.4 states that “The structure is designed to withstand seismic, tornado, missile and hurricane loadings and flooding”. Flood protection is not listed in Section 2.4.2.10 of the LRA as one of the attributes of the intake structures. In addition, none of the components/commodity groups listed in Table 3.5-11 is credited with the intended function of flood protection. Justify why flood protection is not required.

Resolution: The information requested by the staff is contained in Unit 1 UFSAR Section 3.4.4 on page 3.4-4. Flood protection is provided to the intake structure by locating the intake cooling water pump motors above elevation + 22 feet. As demonstrated in Sections 2.4.5.6 and 2.4.5.7 of the Unit 1 UFSAR, the need for additional flood protection, beyond what is provided by the elevations of the openings of the safety-related structures, is not required to protect any of the safety-related structures from wave runup or wind driven rain, even during a probable maximum hurricane.

RAI 2.4.2.11-1

Section 3.4 of the Unit 2 UFSAR describes stop logs provided for the reactor auxiliary building openings. The UFSAR states “These aluminum stop logs would be stacked to Elevation 22.0 feet and secured with bolts ... The stop logs are stored onsite in a manner that reserves their readiness for use. When a hurricane watch is posted for the plant, the stop logs are removed from storage and prepared for installation; with actual installation occurring when the hurricane warning is posted for the plant.” However, LRA Table 3.5-12, which lists the components of the reactor auxiliary building that are in the scope of license renewal and subject to an AMR, does not list aluminum stop logs or bolts. Please identify the LRA table where these components, which should be credited with the intended function of protection against floods and high winds are listed, or justify their exclusion.

Resolution: The Information requested by the staff is located in Unit 2 UFSAR Section 3.4 on page 3.4-1. Based upon the probable maximum flood high water level, wave runup level and plant island elevation, flood protection stop logs at entrances (whose minimum elevation is at least +19.5 feet) to safety-related buildings are not deemed necessary. Additional wave runup protection is provided to the entrances of the reactor auxiliary building by installing stop logs to

a height of + 22 feet. Therefore, stop logs are considered to be outside the scope of license renewal. Stop logs are not used at Unit 1.

RAI 2.4.2.12-1

Section 2.4.2.12 of the LRA describes the steam trestle areas. It states that "Each Steam Trestle Area consists of two braced steel tower structures that contain safety-related components from the Main Steam, Feedwater and Auxiliary Feedwater Systems". The steam trestle area for Unit 1 is described in Appendix 3C of the UFSAR. On page 3C-1 it is stated that "The only other safety related components in the area are the three auxiliary feedwater pumps and motors which are located under the trestles." On page 3C-4 it is stated that "There is no danger that a rupture of a steam line or feedwater line could cause a loss of function of more than one auxiliary pump due to flooding. Each of the three pumps are provided with a flood wall around them to elevation +22 ft."

A list of steam trestle areas structural components requiring an aging management review and the component intended functions is provided in Table 3.5-13. In the component/Commodity Group, reinforced concrete above and below groundwater is listed along with the intended functions. However, flood protection is not included as an intended function in Table 3.5-13. Justify its exclusion.

Resolution: The information requested by the staff is contained in Unit 1 UFSAR Section 3.2.2 on pages 3.2-4 to 2.3-10. The steam trestle areas are not safety-related structures and are not designed against flooding. However, the steam trestle areas components, which meet flood criterion b, are required to be positioned at sufficient elevations to preclude flooding.

RAI 2.4.2.13-1

Section 2.4.2.13 of the LRA describes the turbine buildings. It states that "Both Turbine Buildings have safety-related piping buried beneath the ground floor slab". A list of turbine building components/commodity groups within the scope of license renewal is provided in Table 3.5-14. The safety-related piping buried beneath the ground floor slab is not included in Table 3.5-14. Justify its exclusion.

Resolution: The information requested by the staff is contained in Table 3.4-3 on page 3.4-20 of the LRA. The commodity group piping/fittings is evaluated for stainless steel material that is exposed to buried and embedded/encased environments. Note 1 reads, "Condensate storage tank cross-connect piping is susceptible to wetting." Note 2 reads, "Unit 1 auxiliary feedwater pump suction and recirculation piping is buried in sand beneath the Turbine Building and is not susceptible to wetting. Unit 2 auxiliary feedwater pump suction and recirculation piping is embedded/encased in concrete."

RAI 2.4.2.15-2

License renewal drawing 2-FP-01 (at locations H4, H5) highlights all of the components in the flow path from the yard sump to the component cooling sump for Unit 2. Yard sump pump 2A is listed in Table 3.3-13 as an in-scope component of the service water system. However, the yard sump is not listed in Table 3.3-13 or in Table 3.5-16, which identifies yard structures that are in the scope of license renewal and subject to an AMR. Justify its exclusion.

Resolution: The information requested by the staff is contained in Table 3.5-15 on page 3.5-93 of the LRA. The yard sump is a recess in the foundation slab that is identified as a reinforced concrete pipe trench on page 3.5-93.

SECTION 3.1 REACTOR COOLANT SYSTEMS

3.1.1 Reactor Coolant Piping

RAI 3.1.1.1-1

The Standard Review Plan for License Renewal (SRP-LR) outlines in section 3.1.3.2.4, "Crack Initiation and Growth due to Thermal and Mechanical Loading or Stress Corrosion Cracking", that a one time inspection for internal surfaces of the piping for the management of crack initiation and growth due to mechanical loading of small-bore reactor coolant system and connected system piping (<NPS 4) should be augmented by verifying that the service-induced weld cracking is not occurring in the small-bore piping, including pipe, fittings, and branch connections. While Section 3.1.1.1.2 of the LRA addresses one-time Small Bore Class 1 Piping Inspection, there is no mention of inspection for service induced weld cracking within that section or in the AMP for Small Bore Class 1 Piping Inspection. Discuss how the AMP intends to include inspection for weld cracking including: (a) determination of the sample size based on an assessment of materials of fabrication, environment, cracking due to mechanical (service) loading, and operating experience; (b) identification of the inspection locations in the system or component based on mechanical (service) loading; (c) determination of the examination technique, including acceptance criteria that would be effective in managing mechanical (service) loading for which the component is examined.

Resolution: The information requested by the staff is contained in Appendices A1 and B on pages A1-3 and B-19 of the LRA. A one-time volumetric inspection of a sample of small-bore Class 1 piping will be performed to determine if cracking is an aging effect requiring management during the period of extended operation. FPL will provide the NRC with a report, describing the details of the inspection plan prior to its implementation.

RAI 3.1.1.1-2

The License Renewal Application indicates in Section 3.1.1.1.2, pg. 3.1-4 that reduction in fracture toughness of Cast Austenitic Stainless Steel (CASS) for piping, fittings, and safe ends requires management through Thermal Aging Embrittlement of CASS program. No information was provided on the safety valve flanges or closure flanges. Please indicate whether these are CASS materials and if they are intended to be covered by any management program.

Resolution: The information requested by the staff is contained in Section 3.1.1.1 on page 3.1-4 and Table 3.3-1 of the LRA. The Thermal Aging Embrittlement of CASS Program provides assurance that reduction in fracture toughness due to thermal aging is managed and that the intended function of the Class 1 CASS piping, fittings, and safe ends is maintained consistent with the St. Lucie, Units 1 and 2, Current Licensing Basis for the period of extended operations.

3.1.2 Pressurizers

RAI 3.1.2 - 1

The pressurizer lower head cladding weld material was identified in the LRA as INCO 182/82 but did not list that material in Section 3.1.2.1 Materials and Environments. Identify all RCS components and subcomponents that are fabricated from weld metal using INCO 182/82, and are exposed to primary water. Describe the aging management programs used to manage the

cracking due to stress corrosion cracking (SCC), in particular primary water SCC (PWSCC), in these items during the license renewal period, or provide the basis for not requiring management of this aging effect.

Resolution: The information requested by the staff is contained in Section 3.1.2.2.1 on page 3.1-13 and Table 3.1-1 on page 3.1-46 of the LRA. The pressurizer lower head cladding material, Alloy 82/182, is susceptible to cracking due to PWSCC. The American Society of Mechanical Engineers (ASME) Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program and the Chemistry Control Program provide assurance that PWSCC of the pressurizer lower head cladding is managed and that the intended function of the pressurizers is maintained consistent with the St. Lucie, Units 1 and 2, Current Licensing Basis for the period of extended operation.

RAI 3.1.2 - 2

In order to support the conclusion in WCAP-14574 that SCC would not be a problem in welded Type 304 stainless steel pressurizer supports, if a reasonable justification could be made that the associated welds were not in the sensitized state, describe how the implementation of St. Lucie or FPL plant-specific procedures and quality assurance criteria for the welding and testing of austenitic welds, if any, provides a reasonable assurance that sensitization has not occurred in these welds.

Resolution: The information requested by the staff is contained in Table 3.1-1 on page 3.1-46 of the LRA. The applicant did not reference WCAP-14574 and, therefore, did not evaluate the sensitization of welds. The applicant controls cracking of welds in stainless steel by means of the Chemistry Control Program and the ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program.

RAI 3.1.2 - 3

Propose an AMP to verify whether thermal fatigue-induced cracking in the pressurizer cladding has propagated through the clad into the ferritic base metal or weld metal materials beneath the clad.

Resolution: The information requested by the staff is contained in Section 4.3.3 on page 4.3-5 of the LRA. The applicant determined that the fatigue design analysis for St. Lucie, Units 1 and 2, is a time-limited aging analysis (TLAA). Environmental effects on Class 1 component fatigue have been evaluated separately to determine if any additional actions are required for the period of extended operation. The staff will review the TLAA for environmentally assisted fatigue and issue RAIs as necessary.

3.1.6 Steam Generators

RAI 3.1.6 - 1

Certain steam generator components included in section IV.D1 of the GALL report are absent from Table 3.1-1 in the LRA. The applicant has clarified some of the differences as due to plant-specific steam generator configurations. However, the applicant should clarify why the following steam generator structure and components are missing in Table 3.1-1 of the LRA:

(A) Explain the absence of sleeves in Table 3.1-1 of the LRA. It is not clear whether sleeves have been installed in Units 1 and 2 steam generator tubes. Absence of sleeves in the LRA precludes the use of sleeves in the future. The applicant should consider the sleeves as a component for aging management in Section 3.1.6 and Table 3.1-1 of the LRA.

(B) The applicant discussed aging management of U-tubes, but not tubes, in Table 3.1-1 (page 3.1-66) of the LRA. The applicant discussed aging issues of tubes in Sections 3.1.6.2.1 and 3.1.6.2.2. It is not clear to the staff whether U-tubes in Table 3.1-1 represent the low row (short radius) U-bend tubes or the entire tube bundle because there is no discussion of tubes in Table 3.1-1 of the LRA. Clarify.

Resolution: The applicant stated that there are no sleeves installed in any of the steam generators. The staff will not issue paragraph (A) as part of the RAI. The staff issued paragraph (B) as RAI 3.1 - 2.

RAI 3.1.6 - 2

The staff found that certain aging effects applied to steam generator components are absent from the LRA. The applicant needs to clarify why the following aging effects are not specified in Table 3.1-1 in the LRA:

(A) Clarify why fatigue damage was not applied as an aging effect to the following components in Table 3.1-1 of the LRA: primary head, feedwater nozzles and safe ends, steam outlet nozzle and safe ends, upper and lower shells, primary inlet and outlet nozzles and safe ends, and transition cones.

(B) On page 3.1-69 of the LRA, the applicant specified that the external surface of the primary instrument nozzles may be affected by leaking borated water. However, there was no aging effect and associated aging management program applied to the primary instrument nozzles under this external environment. Is there an aging management program to address boric acid leakage?

(C) Clarify why loss of material due to boric acid corrosion (on the external surface) was not an aging effect applied to the following components: primary manway covers, secondary manway and handhold closure covers, shell assembly, feedwater nozzles and safe ends, auxiliary feedwater nozzles and safe ends (if this components are in Units 1 and 2 steam generators), steam outlet nozzles and safe ends, and primary heads.

(D) In Table 3.1-1 of the LRA, cracking was identified as an aging effect for Unit 1 stainless steel tube support lattice bars, but cracking was not identified for Unit 2 carbon steel tube support lattice bars. The staff judges that cracking should also be identified as an aging effect for Unit 2 carbon steel tube support lattice bars because carbon steel is susceptible to cracking in the treated water environment. The applicant needs to clarify why cracking is not applied to the Unit 2 tube support lattice bars.

(E) Clarify why the following aging effects were not applied to the subject components in Table 3.1-1 of the LRA: (1) Loss of section thickness due to flow-accelerated corrosion was not applied as an aging effect to the tube support lattice bars. (2) Cracking was not applied as an aging effect to primary bolting. (3) Wall thinning due to

erosion was not applied as an aging effect to secondary manways and handholds. (4) Flow accelerated corrosion was not applied as an aging effect to feedwater nozzles and safe ends and steam outlet nozzle and safe ends. (5) Fatigue damage and loss of material due to wastage were not applied as an aging effects to the steam generator tubes.

Resolution: Some of the information requested by the staff is available in the LRA and will not be issued part of the RAI. Sections (B), (C), (D), and (E)(3) were issued as RAI 3.1 - 3.

(A) The thermal and mechanical fatigue analyses of plant mechanical components have been identified as a time-limiting aging analyses for St. Lucie Units 1 and 2. The applicant presents its analysis of fatigue damage in Section 4.3, "Metal Fatigue." Therefore, the staff will will not issue this item as part of the RAI.

(E)(1) The support lattice bars are stainless steel, which is not susceptible to flow-accelerated corrosion. Therefore, the staff will not issue this item as part of the RAI.

(E)(2) The staff issued a separate RAI concerning bolting. Therefore, the staff will not issue this item as part of the RAI.

(E)(4) The information requested by the staff is contained in Table 3.1- on page 3.1-67 of the LRA. The loss of material in feedwater nozzles and safe ends and steam outlet nozzle safe ends is managed, in part, by the Flow Accelerated Corrosion Program. Therefore, the staff will not issue this item as part of the RAI.

(E)(5) The applicant determined that the fatigue design analysis for St. Lucie Units 1 and 2 is a time-limited aging analysis (TLAA). Environmental effects on Class 1 component fatigue have been evaluated separately to determine if any additional actions are required for the period of extended operation. The staff will review the TLAA for environmentally assisted fatigue and issue RAIs as necessary. Therefore, the staff will not issue this item as part of the RAI.

RAI 3.1.6 - 4

As shown on page 3.1-70 of the LRA, the applicant will use the ASME Section XI inservice inspection program as the aging management program to manage loss of mechanical closure integrity of the bolting in the primary and secondary manways and secondary handholds. Is ASME Section XI adequate, if so, provide basis; or, is there a bolting integrity program for St. Lucie?

Resolution: The information requested by the staff is contained in Appendix C on page C-16 of the LRA. The applicant describes its evaluation of non-Class 1 components for the potential aging effects and associated mechanisms related to loss of mechanical closure integrity.

RAI 3.1.6 - 5

In Sections 3.1.6.2.1 and 3.1.6.2.2 of the LRA, the applicant stated that the inspection program performed in accordance with the ASME Code, Section XI, IWB, IWC, and IWD will provide assurance that cracking and wear in Alloy 600 tubing that are managed. The steam generator tubes are a part of the primary system pressure boundary; therefore, they must satisfy the ASME Code, Section XI. However, in practice, licensees use EPRI steam generator

examination guidelines, NEI 97-06, and plant technical specifications in the steam generator tube inspection. In addition to the ASME Code, the applicant should discuss its steam generator tube inspection program in the context of the EPRI steam generator examination guidelines, NEI-97-6, the NRC regulations and guidance, and the St. Lucie technical specifications.

Resolution: The information requested by the staff is contained in Section 3.1.6.2.1 on page 3.1-33 and in Table 3.1-1 on page 3.1-66 of the LRA. The applicant credits the following three programs for managing the aging effects on steam generator tubes:

- Chemistry Control Program
- Steam Generating Integrity Program
- ASME Section XI, Subsections IBW, IWC, and IWD Inservice Inspection Program

These three programs are consistent with the Generic Aging Lessons Learned (GALL) report. No further evaluation is necessary.

RAI 3.1.6 - 6

In Section 3.1.6.2.1, page 3.1-33, the applicant did not discuss cracking in Alloy 690 tubing, presumably because cracking has not been detected in Alloy 690 tubes in the domestic steam generators. However, there is no evidence to suggest that Alloy 690 tubing would be exempt from cracking in the future. The applicant should describe the potential aging effects and associated aging management program for Alloy 690 tubing in unit 1 steam generators. In addition, the applicant needs to describe its inspection program for Alloy 690 tubing if cracking were detected in Alloy 690 tubing in the future.

Resolution: The information requested by the staff is contained in Table 3.1-1 on page 3.1-66 of the LRA. The applicant has evaluated Alloy 690TT and Alloy 600 HTMA tubes for cracking and loss of material. The applicant credits the following three programs for managing these aging effects:

- Chemistry Control Program
- Steam Generating Integrity Program
- ASME Section XI, Subsections IBW, IWC, and IWD Inservice Inspection Program

These three programs are consistent with the GALL report. No further evaluation is necessary.

SECTION 4: TIME-LIMITED AGING ANALYSES:

4.6.4 Alloy 600 Instrument Nozzle Repairs

RAI 4.6.4 - 1

The staff's criteria for performing plant-specific thermal fatigue crack growth assessments are contained in the in the staff's safety evaluation (SE) on Topical Report No. CE NPSD-1198-P, Revision 00, dated February 8, 2002, as stated in Section 2.3.1 and summarized in Section 3.2. Perform a plant-specific thermal fatigue crack growth assessment for the bounding half-nozzle repair implemented at St. Lucie Nuclear Station.

If the assessment has not already been performed, the calculational and technical details of this assessment need not be submitted. Provide a discussion that demonstrates that either:

(A) the thermal fatigue crack growth analysis calculation provided in Proprietary Calculation A-GEN-PS-0003, Revision 00, "Evaluation of Fatigue Crack Growth Associated with Small Diameter Nozzles in CEOG Plants," and summarized in CEOG Topical Report No. CE NPSE-1198-P, Revision 00, is bounding relative to the bounding plant-specific analysis, or

(B) the existing flaw in the nozzle's original J-groove weld metal will be acceptable for continue service over the extended period of operation. Consider both the hot-leg piping and pressurizer shell.

Resolution: The information requested by the staff is contained in Section 4.6.4 on page 4.6-5 of the LRA. The applicant states that the indications in the "J" weld of the reactor coolant system hot-leg instrumentation nozzle are bounded by the fracture mechanics analysis provided in CEOG Topical Report CE NPSD-1198-P. The applicant also indicates that the CEOG topical report is applicable to the Unit 2 pressurizer steam space nozzle repairs performed in 1994.

APPENDIX B - AGING MANAGEMENT PROGRAMS

B3.1.2 Galvanic Corrosion Susceptibility Inspection AMP

RAI B.3.1.2 - 4

On page A2-30 of the LRA, it is stated that this program will be implemented prior to the end of the initial operating license term for St. Lucie Unit 2. This implies that one-time inspections of Unit 1 piping could be conducted after its initial license period and could be performed as late as 48 years after initial operations. Explain the basis for implementing this program prior to the end of the initial operating license term for St. Lucie Unit 2 instead of prior to the end of the license term for St. Lucie Unit 1.

Resolution: The information requested by the staff is contained in Appendix A1 on page A1-33 of the LRA. The applicant will implement the Galvanic Corrosion Susceptibility Inspection Program at Unit 1 prior to the end of the initial operating license term for St. Lucie, Unit 1.

B.3.2.2 ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program

RAI B.3.2.2-1

The applicant states that "The ASME Section XI, Subsections IWB, IWC, and IWD inservice inspection program" will be enhanced to require evaluation of surge line flaws (as identified) with regard to environmentally assisted fatigue and to require VT-1 inspections of the core stabilizing lugs and core support lugs."

How will the surge line flaws be identified? What examination techniques will be used (visual, surface, volumetric)? At what frequency will the surge lines be examined? What areas of the surge lines are going to be examined? What criteria will be used in the evaluation of the identified flaws?

At what frequency will the VT-1 inspections of the core stabilizing lugs and core support lugs be performed? What acceptance criteria will be used?

Resolution: The applicant describes its use of ASME Section XI, Subsections IWB, IWC, and IWD Inservice Inspection Program in Appendix B on page B-25 of the LRA. This aging management program is consistent with the GALL report. No further evaluation is necessary.

B 3.2.5 Chemistry Control Program

RAI B 3.2.5-1

The Chemistry Control Program is credited for aging management of various systems and structures including eight of the auxiliary systems. The program contains three different aging management programs, Water Chemistry Control, Closed-Cycle Cooling Water System Chemistry, and Fuel Oil Chemistry. Tables in Section 3.3 of the LRA only refer to Chemistry Control Program rather than the specific subprogram. The applicant is requested to clarify which specific subprogram of the Chemistry Control Program is credited for managing the aging effects for the auxiliary systems included in Table 3.3 of the LRA.

Resolution: The information requested by the staff is contained in Table 3.0-1 on page 3.0-2 of the LRA.

The Water Chemistry Control subprogram is credited for systems with internal service environments of “treated water - primary” and “treated water - secondary.”

The Closed-Cycle Cooling Water System Chemistry subprogram is credited for systems with internal service environments of “treated water - borated” and “treated water - other.”

The Fuel Oil Chemistry subprogram is credited for the emergency diesel generator fuel oil system.

B.3.2.5.3 Fuel Oil Chemistry Subprogram

RAI B.3.2.5.3 - 1

In Appendix B Section 3.2.5.3 of the LRA, the applicant stated that other ASTM Standards are utilized for fuel oil testing as specified in the St. Lucie Units 1 and 2 Technical Specifications. The applicant is requested to identify those referred ASTM Standards.

Resolution: The information requested by the staff is contained in Appendix B on pages B-34 and B-35 of the LRA, and page 3/4 8-5 of the St. Lucie, Unit 1 Technical Specifications. The surveillance requirements for the diesel generators reference the following ASDM standards.

ASDM D4057-81
ASDM D4176-82
ASDM D975-81
ASDM D1552-79
ASDM D2622-82
ASDM D2276-83

B.3.2.9 Flow Accelerated Corrosion Program

RAI B.3.2.9-1

(A) The applicant stated that wall thinning problems have occurred in the main feedwater system, condensate system, extraction steam system, moisture separation reheater, and feedwater heater drain line. Clarify whether wall thinning has occurred in these system in the St. Lucie units.

(B) The applicant stated that the FAC program is credited for main steam, auxiliary steam, turbine, main feedwater, steam generator blowdown, reactor coolant (steam generator nozzles) at St. Lucie. Clarify why the condensate systems, extraction steam line, moisture separation reheater, and feedwater heater drains discussed above are not considered in St. Lucie's FAC program.

(C) Describe the process of selecting piping systems to be included in or deleted from the FAC program.

Resolution: The information requested by the staff is contained in Appendix B on page B-41 and Appendix C on page C-13 of the LRA. This aging management program is consistent with the GALL report. No further evaluation is necessary.

RAI B.3.2.9-2

(A) The applicant stated that the FAC program has been an ongoing program at St. Lucie since the 1980's. Since 1996, the applicant has replaced a small number of components due to FAC. Clarify whether the piping component replacement since 1996 has been motivated by the findings of the FAC program or by inspection findings other than the FAC program (e.g., operational leakage or routine maintenance).

(B) Discuss whether wall thinning in piping components had been detected by the FAC program from 1980's to 1996.

Resolution: The information requested by the staff is contained in Appendix B on page B-41 of the LRA. This aging management program is consistent with the GALL report. No further evaluation is necessary.

RAI B.3.2.9-3

In the last paragraph on page B-41 of the LRA, the applicant mentioned an enhanced FAC program. The applicant stated that the FAC program will be enhanced to include small-bore piping associated with selected steam traps and drain line. Discuss the rationale of this enhancement.

Resolution: The information requested by the staff is contained in Appendix B on pages B-15 and B-41 and Appendix C on page C-12 of the LRA. The applicant experienced pipe wall thinning due to erosion in the auxiliary feedwater recirculation lines and the Unit 2 control room air conditioning component cooling water return lines. In lieu of design modifications to address high fluid velocity conditions, the applicant elected to periodically inspect the susceptible lines to

manage loss of material. The Flow Accelerated Corrosion Program is consistent with the GALL report. No further evaluation is necessary.

B.3.2.13 Steam Generator Integrity Program

RAI B.3.2.13 - 1

With respect to operating experience, describe the historical and current degradation mechanisms that have occurred in various regions of the tube bundle in the St. Lucie, Units 1 and 2, steam generators.

Resolution: The information requested by the staff is contained in the latest steam generator inspection reports submitted to the NRC. This aging management program is consistent with the GALL report. No further evaluation is necessary.

RAI B.3.2.13 - 2

The applicant stated that St. Lucie steam generator integrity program is consistent with the guidance provided in NEI 97-06, "Steam Generator Program Guidelines." The staff believes that the applicant should commit to use the latest version of NEI 97-06.

Eight EPRI reports relating to the steam generator tubes are referenced in Appendix A of NEI 97-06. The staff believes that the applicant should commit to use the latest version of the EPRI reports.

Disposition: This draft RAI was not issued. There is no regulatory requirement for licensees to commit to the latest version of the EPRI reports. This aging management program is consistent with the GALL report. No further evaluation is necessary.

RAI B.3.2.13 - 3

The lessons learned from the November 2001 Three Mile Island steam generator (SG) tube rupture due to flow induced vibration (FIV) and the April 2002 Oconee SG tube rupture due to certain degradation mechanisms, indicated that SG Integrity Program may not be able to adequately prevent the SG tube rupture during the plant operation under various SG tube degraded conditions. As the SG tubes degrade and result in changes in dynamic characteristics of the SG tubes, the original design analysis for FIV of SG tubes may not be applicable any more for the degraded SG tubes. Describe, in detail, how your plant-specific SG Integrity Program will ensure that, although favorable inspection results (within allowable) were obtained, the degraded SG tubes will not be ruptured due to FIV and can still perform its intended functions until the next inspection.

Resolution: This aging management program is consistent with the GALL report. No further evaluation is necessary.