DRAFT

Received via e-mail November 1, 2002

L-2002-222
10 CFR 54

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Re: St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
Supplemental Responses to NRC Requests for Additional Information for Review of the St. Lucie Units 1 and 2 License Renewal Application

By letters dated September 26, 2002 (L-2002-157, L-2002-159, and L-2002-166), FPL provided responses to NRC Requests for Additional Information (RAIs) associated with the License Renewal Application (LRA) Section 3.0 - Aging Management Reviews, and LRA Appendix B - Aging Management Programs. By letter dated October 3, 2002 (L-2002-144), FPL provided responses to NRC RAIs associated with LRA Section 2.0 - Scoping and Screening. Based on a review of our responses, the NRC requested additional information regarding FPL responses to the following: Scoping and Screening RAI 2.3.3.15-1, Aging Management Review RAIs 3.2.2-3, 3.3.2-4, 3.3.9-3, 3.3.15-1, 3.5-1, and 3.6-2, and Aging Management Program RAIs B.3.1.2-1 and B.3.2.5-2. Accordingly, Attachment 1 to this letter contains supplemental responses to these RAIs. Please note that a supplement to the FPL response to Scoping and Screening RAI 2.3.2-6 is also included in Attachment 1.

Should you have any further questions, please contact S. T. Hale at (772) 467-7430.

Very truly yours,

D. E. Jernigan
Vice President
St. Lucie Plant

DEJ/STH/hlo
Attachment

St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389

Supplemental Response to NRC Request for Additional Information Regarding the License Renewal Application.

STATE OF FLORIDA)
) ss
COUNTY OF ST. LUCIE)

D. E. Jernigan being first duly sworn, deposes and says:

That he is Vice President – St. Lucie of Florida Power and Light Company, the Licensee herein;

That he has executed the foregoing document; that the statements made in this document are true and correct to the best of his knowledge, information and belief, and that he is authorized to execute the document on behalf of said Licensee.

____
D. E. Jernigan

Subscribed and sworn to before me this

______ day of ______________, 2002.

____

____
Name of Notary Public (Type or Print)

D. E. Jernigan is personally known to me.

cc: U.S. Nuclear Regulatory Commission, Washington, D.C.
Program Director, License Renewal & Environmental Impacts
Project Manager, St. Lucie License Renewal
Project Manager, St. Lucie

U.S. Nuclear Regulatory Commission, Region II
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ST. LUCIE UNITS 1 AND 2
DOCKET NOS. 50-335 AND 50-389
ATTACHMENT 1
SUPPLEMENTAL RESPONSE TO NRC REQUESTS FOR ADDITIONAL INFORMATION FOR REVIEW OF THE ST. LUCIE UNITS 1 AND 2 LICENSE RENEWAL APPLICATION

RAI 2.3.3.15 - 1

The ventilation system license renewal boundary drawings, which are identified below, show damper components for both Units 1 and 2; however, LRA Table 3.3-15 does not identify the housings for these dampers. It appears that these component housings are passive and long-lived and, as such, should be within the scope of license renewal and subject to an AMR. Justify why these components are considered to be outside the scope of license renewal or are not subject to an AMR.

NOTE: Numbers added by FPL to correlate response to specific question.

Unit 1 on license renewal boundary drawing 1-HVAC-01, Rev. 0

1. Hot shutdown panel housing for fans HVS-9 and HVE-35 at locations E7 and D7
2. Unlabeled damper housing at locations E7

Unit 1 on license renewal boundary drawing 1-HVAC-02, Rev. 0

1. Control room cooling system damper housings 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, D-20 at location A7, D-21 at location B7, D-22 at location C7, GD-7 at location A8, GD-8 at location B8, GD-9 at location C8, D-29A at location C4, D-29B at location C5, D-41 at location C8, D-42 at location C7, and unlabeled at locations C8 and D8
2. Control room cooling system fan housings HVE-13A at location B6; HVE-13B at location C6; HVA-3A, 3B, and 3C at locations A7, B7, and C7, respectively; HVA-10A at location C8; and 10B at location D8
3. Control room cooling system charcoal adsorber housings for heating, ventilation and air conditioning (HVAC) units HVE-13A and 13B at location B5
4. Emergency core cooling system area ventilation fan housings HVS-4A and 4B at locations D2 and E2, and HVE-9A and 9B at locations D5 and E5
5. Emergency core cooling system area ventilation damper housings L-8 at location E1; GD-3 at location D2; GD-4 at location E2; D-1, D-2 , D-3, and D-4 at location D3; D-8A and D-8B at location E3; GD-12 at location E3; D-7A and D-7B at location F3; D-9A and D-9B at location D4; D-12A and D-12B at location E4; D-5A and D-5B at location E4;
D-6A and D-6B at location F4; D-13 and D-14 at location D4; D-15 and D-16 at location E4; L-7A at location D5; and L-7B at location E5
6. Housings for battery room exhaust fans RV-1 and RV-2 at location G3,

and an unlabeled gravity damper housing at location G3

7. Housings for electrical equipment room fans HVS-5A and HVS-5B at locations G5 and H5, RV-3 and RV-4 at locations G5 and G6, and HVE-11and HVE-12 at locations G6 and H6

8. Housings for electrical equipment room dampers L-11 at location G4, GD-1 and GD-2 at location G5, unlabeled dampers at locations G5 and G6, and L-9 and L-10 at locations G6 and H6

9. Housings for shield building ventilation fans HVE-6A and 6B at locations D7 and F7

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

11. Housings for outdoor air conditioning units ACC-3A, ACC-3B, and ACC-3C at locations A7, B7, and C7

12. Housings for air handling units HVA-10A and HVA-10B at locations C8 and D8

Unit 2 on license renewal boundary drawing 2-HVAC-01, Rev. 0

1. Intake structure exhaust fan housings 2HVE-41A and 41B at location F5

2. Housings for unlabeled intake structure pressure dampers at location F5

Unit 2 on license renewal boundary drawing 2-HVAC-02, Rev. 0

1. Control room cooling system damper housings 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; GD-6 at location B4; unlabeled at locations A5, B5, and 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 D5

2. Control room cooling system fan housings 2HVE-13A at location A4 and 2HVE-13B at location B4

3. Housings for air handling unit fans 2HVA/ACC-3A at location A6, 2HVA/ACC-3B at location B, and 2HVA/ACC-3C at location C6

4. Control room cooling system charcoal adsorber housings for HVAC units 2HVE-13A and 13B at locations A4 and B4

5. Emergency core cooling system area ventilation fan housings 2HVS-4A and 4B at locations D2 and E2, and 2HVE-9A and 9B at locations D5 and E5

6. Emergency core cooling system area ventilation damper housings 2L-8 at location E1; unlabeled at locations D2 and E2; D-1, D-2, D-3, and D-4 at location D3; GD-12 at location E3; D-7B at location F3; unlabeled at location F3 (total of 3); D-9A and D-9B at location D4; D-12A and 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; and 2L-7B at

location E7

7. Housings for battery room exhaust fans RV-1, RV-2, RV-3, and RV-4 at location H2, and unlabeled damper at location G2

8. Housings for electrical equipment room fans 2HVS-5A and 5B at locations G3 and H3, and 2HVE-11 and 12 at location H4

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

Unit 2 on license renewal boundary drawing 2-HVAC-03, Rev 0

1. Fuel handling building ventilation damper housings D-29 and D-30 at location B2, D-33 and D-34 at location C2, D-31 and D-32 at location B4, D-35 and D-36 at location C4
2. Housings for shield building ventilation fans 2HVE-6A and 6B at locations D6 and F6
3. Housings for shield building ventilation dampers GD-10 at location D6, D-23 at location D7, GD-11 at location F6, and D-24 at location F7

FPL Response

The response below supercedes the response to RAI 2.3.3.15-1 transmitted in FPL Letter L-2002-144 dated October 3, 2002. This response is being revised to address inconsistencies identified by the NRC regarding internal aging effects associated with carbon steel housings for fans and dampers.

As noted in LRA Subsection 2.1.2.1 (page 2.1-12), active/passive determinations were performed based on the guidance of Appendix B of NEI 95-10.

Consistent with that guidance, fans and dampers (including their housings) are defined as active components and thus do not require an AMR. However, based upon the NRC staff's position on previous license renewal applications and expectations conveyed at prior meetings with the staff, housings for fans and dampers have been included in the aging management review for the applicable ventilation systems. Changes to LRA Table 3.3-15 (pages 3.3-75 through
3.3-88), if required, as a result of the above are addressed in the specific responses below.

License Renewal Boundary Drawing 1-HVAC-01

HVS 9 is included in Miscellaneous Ventilation in component grouping "Filter housings" and HVE-35 is included in Miscellaneous Ventilation in component grouping "Ducts" in LRA Table 3.3-15 (page 3.3-82).

Unlabeled damper at E7 is in Miscellaneous Ventilation. See Table 2.3.3.15-1-4 for changes to LRA Table 3.3-15 associated with component grouping "Damper housings."

License Renewal Boundary Drawing 1-HVAC-02

Dampers D-17, D-18, D-19, GD-5, GD-6, D-20, D-21, D-22, GD-7, GD-8, GD-9,D-29A, D-29B, D-41, and D-42 are in Control Room Air Conditioning. See Table 2.3.3.15-1-1 for changes to LRA Table 3.3-15 associated with component grouping “Damper housings.” The unlabeled dampers at C8 and D8 are in Miscellaneous Ventilation. See Table 2.3.3.15-1-4 for changes to LRA Table 3.3-15 associated with component grouping “Damper housings.”

Fan housings HVE-13A and HVE-13B are in Control Room Air Conditioning. See Table 2.3.3.15-1-1 for changes to LRA Table 3.3-15 associated with component grouping “Fan housings.” Fan housings HVA-3A, HVA-3B, and HVA-3C are included in Control Room Air Conditioning in component grouping “Filter housings” in LRA Table 3.3-15 (pages 3.3-76 and 3.3-77). Fan housings HVA-10A and HVA-10B are included in Miscellaneous Ventilation in component grouping “Filter housings” in LRA Table 3.3-15 (page 3.3-82).

The control room air conditioning charcoal adsorbers are housed inside an air-handling unit (which also houses the filter), the fans housing is included in component grouping “Filter housings” in LRA Table 3.3-15, pages 3.3-76 and 3.3-77.

Fan housings HVS-4A and HVS-4B are included in Reactor Auxiliary Building (RAB) Main Supply and Exhaust in component grouping “Shell for HVS-4A and HVS-4B plenum and filters” in Table 3.3-15 (pages 3.3-85 and 3.3-86). Fan housings HVE-9A and HVE-9B are in Emergency Core Cooling System (ECCS) Area Ventilation. See Table 2.3.3.15-1-2 for changes to LRA Table 3.3-15 associated with component grouping “Fan housings.”

Dampers L-8, GD-3, GD-4, D-1, D-2, D-3, D-4, D-8A, D-8B, GD-12, D-7A, D-7B, D-9A, D-9B, D-12A, D-12B, D-5A, D-5B, D-6A, and D-6B, are in RAB Main Supply and Exhaust. See Table 2.3.3.15-1-6 for changes to LRA Table 3.3-15 associated with component grouping “Damper housings.” Dampers D-13, D-14, D-15, and D-16, and L-7A and L-7B are in ECCS Area Ventilation. See Table 2.3.3.15-1-2 for changes to LRA Table 3.3-15 associated with component grouping “Damper housings.”

Fan housings RV-1 and RV-2 are in RAB Electrical and Battery Room Ventilation. See Table 2.3.3.15-1-5 for changes to LRA Table 3.3-15 associated with component grouping “Fan housings.” Gravity Damper at location G3 is in RAB Electrical and Battery Room Ventilation. See Table 2.3.3.15-1-5 for changes to LRA Table 3.3-15 associated with component grouping “Damper housings.”

Fan housings HVS-5A and HVS-5B are included in RAB Electrical and Battery Room Ventilation in component grouping “Shell for HVS-5A and HVS-5B plenum and filters” in Table 3.3-15 (pages 3.3-83 and 3.3-84). Fan housings RV-3, RV-4, HVE-11 and HVE-12 are in RAB Electrical and Battery Room Ventilation. See Table 2.3.3.15-1-5 for changes to LRA Table 3.3-15 associated with component grouping “Fan housings.”

Dampers L-9, L-10, and L-11 are mounted in the wall of the RAB, and thus do not have housings. Dampers GD-1, GD-2, and the unlabeled dampers at G-5 and G-6 are in RAB Electrical and Battery Room Ventilation. See Table 2.3.3.15-1-5 for changes to LRA Table 3.3-15 associated with component grouping “Damper housings.”

Fan housings HVE-6A and HVE-6B are in Shield Building Ventilation. See Table 2.3.3.15-1-7 for changes to LRA Table 3.3-15 associated with component grouping “Fan housings.”

Dampers GD-10, D-23, GD-11 and D-24 are in Shield Building Ventilation. See Table 2.3.3.15-

1-7 for changes to LRA Table 3.3-15 associated with component grouping "Damper housings."

The control room air conditioning outdoor air conditioning units ACC-3A, ACC-3B, and ACC-3C are active components, therefore they do not require an AMR.

Fan housings HVA-10A and HVA-10B are included in Miscellaneous Ventilation in component grouping "Filter housings" in LRA Table 3.3-15 (page 3.3-82).

License Renewal Boundary Drawing 2-HVAC-01

Fans 2HVE-41A and 2HVE-41B are mounted in the roof of the intake cooling water pump enclosure, and thus do not have housings.

Dampers are mounted in the wall of the intake structure, and thus do not have housings.

License Renewal Boundary Drawing 2-HVAC-02

Dampers D-17A, D-17B, D-20, D-21, D-22, D-18, D-19, GD-5, GD-6, GD-7, GD-8, GD-9, DPR-25-2, DPR-25-3, DPR-25-4, D-39, D-40, and unlabeled dampers at locations A5, B5, and C5 are in Control Room Air Conditioning. See Table 2.3.3.15-1-1 for changes to LRA Table 3.3-15 associated with component grouping "Damper housings."

Fan housings 2HVE-13A and 2HVE-13B are in Control Room Air Conditioning. See Table 2.3.3.15-1-1 for changes to LRA Table 3.3-15 associated with component grouping "Fan housings."

Fan housings 2HVA/ACC-3A, 2HVA/ACC-3B, and 3HVA/ACC-3C are included in Control Room Air Conditioning in component grouping "Filter housings" in LRA Table 3.3-15 (pages 3.3-76 and 3.3-77).

The control room air conditioning charcoal adsorbers are housed inside an air-handling unit (which also houses the filter), the fans housing is included in component grouping "Filter housings" in LRA Table 3.3-15, pages 3.3-76 and 3.3-77.

Fan housings 2HVS-4A and 2HVS-4B are included in RAB Main Supply and Exhaust in component grouping "Shell for HVS-4A and HVS-4B plenum and filters" in Table 3.3-15 (pages 3.3-85 and 3.3-86). Fan housings 2HVE-9A and 2HVE-9B are in ECCS Area Ventilation. See Table 2.3.3.15-1-2 for changes to LRA Table 3.3-15 associated with component grouping "Fan housings."

Dampers 2L-8, D-1, D-2, D-3, D-4,GD-12, D-7B, D-9A, D-9B, D-12A, D-12B and the unlabeled dampers at locations D2, E2, and F3 are in RAB Main Supply and Exhaust. See Table 2.3.3.15-1-6 for changes to LRA Table 3.3-15 associated with component grouping "Damper housings." Dampers D-13, D-14, D-15, and D-16, and 2L-7A and 2L-7B are in ECCS Area Ventilation. See Table 2.3.3.15-1-2 for changes to LRA Table 3.3-15 associated with component grouping "Damper housings."

Fan housings RV-1, RV-2, RV-3 and RV-4 are in RAB Electrical and Battery Room Ventilation. See Table 2.3.3.15-1-5 for changes to LRA Table 3.3-15 associated with component grouping "Fan housings." The unlabeled damper at G-2 is in RAB Electrical and Battery Room Ventilation. See Table 2.3.3.15-1-5 for changes to LRA Table 3.3-15 associated with component grouping "Damper housings."

Fan housings 2HVS-5A, 2HVS- 5B, 2HVE-11, and 2HVE-12 are in RAB Electrical and Battery Room Ventilation. See Table 2.3.3.15-1-5 for changes to LRA Table 3.3-15 associated with component grouping "Fan housings."

Damper 2L-11 is mounted in the wall of the RAB, and thus does not have a housing. Dampers GD-1, GD-2, 2FDPR-25-123, 2FDPR-25-119, GD-19, and GD-20 are in RAB Electrical and Battery Room Ventilation. See Table 2.3.3.15-5 for changes to LRA Table 3.3-15 associated with component grouping "Damper housings."

License Renewal Boundary Drawing 2-HVAC-03

Dampers D-29, D-30, D-31, D-32, D-33, D-34, D-35, and D-36 are in Fuel Handling Building Ventilation. See Table 2.3.3.15-1-3 for changes to LRA Table 3.3-15 associated with component grouping "Damper housings."

Fan housings 2HVE-6A and 2HVE-6B are in Shield Building Ventilation. See Table 2.3.3.15-1-7 for changes to LRA Table 3.3-15 associated with component grouping "Fan housings."

Dampers GD-10, D-23, GD-11 and D-24 are in Shield Building Ventilation. See Table 2.3.3.15-1-7 for changes to LRA Table 3.3-15 associated with component grouping "Damper housings."

TABLE 2.3.3.15-1-1

LRA page 3.3-76 (Internal Environment)
LRA page 3.3-78 (External Environment)

TABLE 3.3-15
VENTILATION

Component/ Commodity Group	Intended Function	Material	Environment	Aging Effects Requiring Management	Program/Activity
Control Room Air Conditioning					
Internal Environment					
Fan housings	Pressure boundary	Carbon steel	Air/gas	Loss of material	Periodic Surveillance and Preventive Maintenance Program
Damper housings	Pressure boundary	Carbon steel	Air/gas	Loss of material	Periodic Surveillance and Preventive Maintenance Program
		Carbon steel Galvanized carbon steel	Air/gas[1]	None	None required
External Environment					
Fan housings	Pressure boundary	Carbon steel	Indoor – not air conditioned	Loss of material	Periodic Surveillance and Preventive Maintenance Program
Damper housings	Pressure boundary	Carbon steel	Indoor – not air conditioned	Loss of material	Periodic Surveillance and Preventive Maintenance Program

	Carbon steel	Indoor – air conditioned	None	None required
	Galvanized carbon steel	Indoor – not air conditioned	None	None required

NOTES:
Air conditioned air.

TABLE 2.3.3.15-1-2

LRA page 3.3-79 (Internal Environment)
LRA page 3.3-80 (External Environment)

TABLE 3.3-15 VENTILATION					
Component/ Commodity Group	**Intended Function**	**Material**	**Environment**	**Aging Effects Requiring Management**	**Program/Activity**
Emergency Core Cooling Systems Area Ventilation					
Internal Environment					
Fan housings	Pressure boundary	Carbon steel	Air/gas	Loss of material	Periodic Surveillance and Preventive Maintenance Program
Damper housings	Pressure boundary	Galvanized carbon steel Aluminum	Air/gas	None	None required
		Carbon steel	Air/gas	Loss of material	Systems and Structures Monitoring Program
External Environment					
Fan housings	Pressure boundary	Carbon steel	Indoor – not air conditioned	Loss of material	Periodic Surveillance and Preventive Maintenance Program
Damper housings	Pressure boundary	Galvanized carbon steel Aluminum	Indoor – not air conditioned	None	None required
		Carbon steel	Indoor – not air	Loss of	Systems and

TABLE 2.3.3.15-1-3

LRA page 3.3-81

TABLE 3.3-15 VENTILATION					
Component/ Commodity Group	**Intended Function**	**Material**	**Environment**	**Aging Effects Requiring Management**	**Program/Activity**
Fuel Handling Building Ventilation					
Internal Environment					
Damper housings	Pressure boundary	Galvanized carbon steel	Air/gas	None	None required
External Environment					
Damper housings	Pressure boundary	Galvanized carbon steel	Indoor – not air conditioned	None	None required

TABLE 2.3.3.15-1-4

LRA page 3.3-82

TABLE 3.3-15 VENTILATION					
Component/ Commodity Group	**Intended Function**	**Material**	**Environment**	**Aging Effects Requiring Management**	**Program/Activity**
Miscellaneous Ventilation					
Internal Environment					
Damper housings	Pressure boundary	Galvanized carbon steel	Air/gas	None	None required
External Environment					
Damper housings	Pressure boundary	Galvanized carbon steel	Indoor – not air conditioned	None	None required

TABLE 2.3.3.15-1-5

LRA page 3.3-83 (Internal Environment)
LRA page 3.3-84 (External Environment)

TABLE 3.3-15 VENTILATION					
Component/ Commodity Group	**Intended Function**	**Material**	**Environment**	**Aging Effects Requiring Management**	**Program/Activity**
Reactor Auxiliary Building Electrical and Battery Room Ventilation					
Internal Environment					
Fan housings	Pressure boundary	Carbon steel	Air/gas	Loss of material	Periodic Surveillance and Preventive Maintenance Program
		Aluminum	Air/gas	None	None required
Damper housings	Pressure boundary	Carbon steel	Air/gas	Loss of material	Periodic Surveillance and Preventive Maintenance Program
		Galvanized carbon steel Aluminum	Air/gas	None	None required
External Environment					
Fan housings	Pressure boundary	Carbon steel	Indoor – not air conditioned	Loss of material	Periodic Surveillance and Preventive Maintenance Program
		Aluminum	Outdoor	None	None required
Damper housings	Pressure boundary	Galvanized carbon steel Aluminum	Indoor – not air conditioned	None	None required
		Carbon steel	Indoor – not air conditioned	Loss of material	Periodic Surveillance and Preventive Maintenance Program

TABLE 2.3.3.15-1-6

LRA page 3.3-85 (Internal Environment)
LRA page 3.3-86 (External Environment)

TABLE 3.3-15
VENTILATION

Component/ Commodity Group	Intended Function	Material	Environment	Aging Effects Requiring Management	Program/Activity
Reactor Auxiliary Building Main Supply and Exhaust					
Internal Environment					
Fan housings	Pressure boundary	Carbon steel	Air/gas	Loss of material	Periodic Surveillance and Preventive Maintenance Program
Damper housing	Pressure boundary	Carbon steel	Air/gas	Loss of material	Periodic Surveillance and Preventive Maintenance Program
		Galvanized carbon steel	Air/gas	None	None required
External Environment					
Fan housings	Pressure boundary	Carbon steel[1]	Indoor – not air conditioned	Loss of material	Periodic Surveillance and Preventive Maintenance Program
Damper housing	Pressure boundary	Carbon steel[1]	Indoor – not air conditioned	Loss of material	Periodic Surveillance and Preventive Maintenance Program
		Galvanized carbon steel	Indoor – not air conditioned	None	None required
			Borated water leaks	Loss of material	Boric Acid Wastage Surveillance Program

NOTES:
Not located near borated water sources.

TABLE 2.3.3.15-1-7

LRA page 3.3-87 (Internal Environment)
LRA page 3.3-88 (External Environment)

TABLE 3.3-15
VENTILATION

Component/ Commodity Group	Intended Function	Material	Environment	Aging Effects Requiring Management	Program/Activity
Shield Building Ventilation					
Internal Environment					
Fan housings	Pressure boundary	Carbon steel	Air/gas	Loss of material	Periodic Surveillance and Preventive Maintenance Program
Damper housing	Pressure boundary	Carbon steel	Air/gas	Loss of material	Systems and Structures Monitoring Program
		Carbon steel[1]	Air/gas	Loss of material	Periodic Surveillance and Preventive Maintenance Program
		Galvanized carbon steel	Air/gas	None	None required
External Environment					
Fan housings	Pressure boundary	Carbon steel	Indoor - not air conditioned	Loss of material	Periodic Surveillance and Preventive Maintenance Program
Damper housing	Pressure boundary	Carbon steel	Indoor – not air conditioned	Loss of material	Systems and Structures Monitoring Program
		Carbon steel[1]	Indoor - not air conditioned	Loss of material	Periodic Surveillance and Preventive Maintenance Program
		Galvanized carbon steel	Indoor – not air conditioned	None	None required

NOTES:

Located at the fan discharge.

RAI 2.3.2 - 6

Figure 6.2-46 of the UFSARs for Units 1 and 2 shows gravity dampers (at numerous locations) as components of the containment cooling system. The housings for these components were neither identified in LRA Table 3.2-1 nor shown on License Renewal Boundary Drawings
1-HVAC-01 and 2-HVAC-01. It appears that these component housings are passive and long-lived and, as such, should be within the scope of license renewal and subject to an AMR. Justify why the gravity dampers are considered to be outside the scope of license or are not subject to an AMR.

FPL Response

The response below supercedes the response to RAI 2.3.2-6 transmitted in FPL Letter
L-2002-144 dated October 3, 2002. This response is being revised to correct an administrative error regarding the damper housing material.

Containment Cooling gravity dampers were considered to be within the scope of license renewal because they support Containment Cooling system intended functions. Gravity dampers do not appear in LRA Table 3.2-1 (page 3.2-9) because they were considered to be active components, and thus not subject to an aging management review (AMR) in accordance with 10 CFR 54.21(a)(1)(i) and the guidance of NEI 95-10. However, based upon the NRC staff's position on previous license renewal applications and expectations conveyed at prior meetings, AMRs of the gravity damper housings for Containment Cooling have been performed. LRA Table 3.2-1 is revised to include the following:

LRA page 3.2-10 (Internal Environment)
LRA page 3.2-13 (External Environment)

TABLE 3.2-1
CONTAINMENT COOLING

Component/ Commodity Group [GALL Reference]	Intended Function	Material	Environment	Aging Effects Requiring Management	Program/Activity
Internal Environment					
Backdraft damper housings	Pressure boundary	Carbon steel	Indoor – not air conditioned	Loss of material	Periodic Surveillance and Preventive Maintenance Program
Isolation damper housings	Pressure boundary	Carbon steel	Indoor – not air conditioned	Loss of material	Systems and Structures Monitoring Program
External Environment					
Backdraft damper housings	Pressure boundary	Carbon steel	Containment air	Loss of material	Periodic Surveillance and Preventive Maintenance Program

Isolation damper housings	Pressure boundary	Carbon steel	Containment air	Loss of material	Systems and Structures Monitoring Program

RAI 3.3.2-3

The applicant did not identify SCC as an aging effect for the CCW heat exchanger tubes that are exposed to raw water. The operating experience at Turkey Point Station, shows that the CCW heat exchanger tubes, which are made of aluminum brass and exposed to raw water on the tube side, are susceptible to SCC (see U. S. Nuclear Regulatory Commission "Safety Evaluation Report with Open Items Related to the License Renewal of Turkey Point Nuclear Plant, Units 3 and 4," dated August 2001, p. 239). Provide the bases for excluding cracking as an applicable aging effect for CCW heat exchanger tubes that are exposed to raw water at St. Lucie.

FPL Response

The response below supercedes the response to RAI 3.3.2-3 transmitted in FPL Letter
L-2002-159 dated September 26, 2002. This response is being revised to clarify that sacrificial anodes in the Component Cooling Water heat exchangers are not credited for license renewal.

The metallurgical analysis of the failed Turkey Point Component Cooling Water (CCW) heat exchanger tubes revealed that the cracking was initiated from the inside diameter (raw water side) and was located in the tube roll transition zone of the tube sheet. The cracking was determined to be transgranular stress corrosion cracking and was caused by the use of a new chemical injection system and the absence of sacrificial anodes. The tubes were replaced, the chemical injection system was removed from service, and zinc anodes were installed as an additional preventive measure.

Although the St. Lucie CCW heat exchangers also utilize aluminum brass tubes, they have not experienced stress corrosion cracking (SCC). This is primarily due to the fact that St. Lucie never utilized a chemical injection system similar to the one once installed at Turkey Point. Additionally, although not credited for aging management at St. Lucie, sacrificial anodes are installed as a preventive measure to protect the raw water side of the CCW heat exchangers. Finally, a review of St. Lucie metallurgical analysis reports of CCW heat exchanger tubes removed in 1988 and 1991 did not identify the presence of SCC. Therefore cracking due to SCC is not an aging affect requiring management for these components.

RAI 3.3.2-4

Aging effects for CCW system components exposed to the air/gas environment depend, in part, on the type of air/gas environment, the operating temperature, and the water content. Provide the characteristic parameters of the air/gas environments applicable to the components found in the CCW system. Also provide the bases for excluding corrosion as an applicable aging effect for CCW components that are exposed to the air/gas environment.

FPL Response

The response below supercedes the response to RAI 3.3.2-4 transmitted in FPL Letter
L-2002-159 dated September 26, 2002. This response is being revised to describe the use of the MCIC report referenced in the response.

The Component Cooling Water (CCW) surge tanks are vented carbon steel tanks that are internally coated for corrosion protection. The air/gas internal environment identified in LRA Table 3.3-2 (pages 3.3-18 and 3.3-19) applies to the CCW surge tanks and associated valves, piping and fittings located above the normal tank water level. This air/gas environment constitutes the atmospheric air of the surroundings (i.e., "indoor – not air-conditioned"). See LRA Appendix C Subsection 4.1.3 (page C-8).

The aging management review of the internal surfaces of the carbon steel CCW surge tanks exposed to an air/gas environment identified general corrosion as a potential aging mechanism. Based upon the location of these tanks (i.e., inside the Reactor Auxiliary Building) and the limited air exchange with the environment provided by their 2” vents, aggressive chemical species will not be present and significant pitting corrosion is not expected. Additionally, these tanks are internally coated and a review of St. Lucie plant-specific operating experience did not identify corrosion as an aging effect requiring management.

A calculation was performed to demonstrate that the 80 mils design corrosion allowance for these tanks will accommodate any potential internal corrosion. Utilizing conservative corrosion rates for "Steel Category A" from Tables 6-1 and F-1 of MCIC Report, July,1986, “Corrosion of Metals in Marine Environment” by J. A. Beavers, G. H. Koch and W. E. Berry, the worst case internal loss of material is calculated to be 76 mils. The corrosion rates are derived from Table 6-1 utilizing the “inland” environment and “Average Reduction in Thickness” data. As mentioned above, the aging mechanism of concern for the internal surfaces of the CCW surge tank air space is general corrosion. Therefore, uniform loss of material is expected and the column providing an average reduction in thickness is applicable. The "Inland" environment data is applicable based upon expected conditions for the air space inside the CCW surge tank. Since the CCW surge tank is located inside the Reactor Auxiliary Building and has a small vent providing for limited air exchange with surrounding environment, the high humidity of inland tropical environment

without aggressive species, such as chlorides, is applicable. The corrosion rates utilizing this data are 2.8 mils for the first year, 2.3 mils for the second year (i.e., 5.1 cumulative), 3.2 mils for the third and fourth years (i.e. 8.3 cumulative), and approximately 1.1 for each of the next 4 years (i.e., 12.6 mils total for 8 years). For conservatism, a corrosion rate of
3 mils/year was assumed for the first 8 years, followed by a 1 mil/year corrosion rate for the remainder of plant life (3 mils/year x 8 years + 1 mil/year x 52 years). These corrosion rates are based upon comprehensive evaluations of corrosion damage to steel exposed to tropical atmosphere in the Panama Canal Zone. As expected, the corrosion rate decreases with time due to the buildup of an oxidation layer which will tend to provide some protection of the bare metal underneath. The use of these corrosion rates assumes no preventive measures (i.e., existing coatings) have been implemented since original installation, and thus incorporates inherent design margin. Based on these results, the minimum required design wall thickness of the tanks is maintained. Therefore, loss of material due to corrosion of the internal surfaces of the CCW surge tanks (which are exposed to an air/gas environment) is not an aging effect requiring management.

The aging management review of the internal surfaces of the small diameter carbon steel valves and schedule 80 pipe/fittings associated with the level switches/sight glasses of the CCW surge tanks exposed to an air/gas environment also identified general corrosion as a potential aging mechanism. As discussed above, these tanks are located inside buildings and are each vented by a 2” vent valve. There is limited air exchange through the vent valves. Therefore the rate of general corrosion is expected to be low. However, even assuming a corrosion rate of 76 mils in 60 years (as calculated above), loss of pressure boundary integrity will not occur because adequate wall thickness will remain. The approximate wall thickness of 1 inch schedule 80 piping is 180 mils. The wall thickness of components, such as valves, is even greater. The minimum required wall thickness for these components is 2 mils. Therefore, the remaining wall thickness of 104 mils is more than adequate to meet design requirements and adequate corrosion allowance exists for these components. Additionally, a review of St. Lucie plant-specific operating experience did not identify internal corrosion of these components as an aging effect requiring management. Therefore, loss of material due to corrosion of the internal surfaces of valves, piping, and fittings associated with the CCW surge tanks (which are exposed to an air/gas environment) is not an aging effect requiring management.

Finally, it should be recognized that loss of pressure boundary integrity above the water line will not result in loss of inventory or impact CCW surge tank system intended function since the CCW surge tanks are normally vented tanks.

RAI 3.3.9 - 3

The applicant relies on detection of leakage for managing loss of material on the inside surface of several components that are exposed to raw water. The presence of leakage from a component, however, would indicate that the component could not perform its intended function as a pressure boundary. The applicant is requested to justify why the use of this program alone is adequate for managing loss of material from the inside surface of the components that are exposed to raw water.

FPL Response

The response below supercedes the response to RAI 3.3.9-3 transmitted in FPL Letter
L-2002-159 dated September 26, 2002. This response is being revised to address use of both the Systems and Structures Monitoring Program and the Intake Cooling Water Inspection Program for aging management.

As described in LRA Appendix B, Subsection 3.2.14 (page B-57), the Systems and Structures Monitoring Program manages the aging effect of loss of material for valves, piping, and fittings at selected locations of Intake cooling Water (ICW) by leakage inspection to detect the presence of internal corrosion. These locations mostly encompass small bore piping components not addressed by the ICW crawl-through inspections due to access limitations. Evaluations have been performed to show that through-wall leakage equivalent to a sheared 3/4" instrument line and an additional 100 gpm opening from another location will not reduce the ICW flow to the Component Cooling Water heat exchangers below design requirements. The leakage inspection is adequate in managing the aging effects of loss of material for the following reasons:

Maintenance history shows that localized failures of cement lining result in small corrosion cells. These corrosion cells will be detected by small through-wall leakage, which provides adequate time for repairs before the system function is degraded.

For small valves, piping and fittings leakage does not affect the system function because the small size of these components limits the leakage. These lines are either constructed of corrosion resistant materials (monel, bronze, aluminum bronze) or are epoxy coated carbon steel. Because the joints in carbon steel lines may be exposed to salt water, a specification was developed to provide for the replacement of these lines with monel on an "as required" basis during inspections or when leaks are identified. Plant operators walk down the ICW System as part of normal shift activities, and would note any leaks that were present. When leaks are identified, they are immediately documented under the corrective action program and receive prompt engineering evaluation and corrective actions. The operating and maintenance history of this equipment demonstrates that leakage for this equipment has not been significant.

In addition to the above process, periodic crawl-through inspections of the large bore piping, as described in the Intake Cooling Water Inspection Program (LRA Appendix B Subsection 3.2.20 page B-43), are conducted to identify, evaluate and repair any component degradations. Although no crawl-through inspections can be performed on the small-bore piping, the connections between the small bore and large bore piping, which are the most likely locations for corrosion, are inspected. Therefore, the Intake Cooling Water Inspection Program, in conjunction with the Systems and Structures Monitoring Program, provides an effective means of aging management for the internal surfaces of Intake Cooling Water.

Table 3.3-9 of the LRA (pages 3.3-59, 3.3-60, and 3.3-61) is revised as shown below:

TABLE 3.3-9
INTAKE COOLING WATER

Component/ Commodity Group [GALL Reference]	Intended Function	Material	Environment	Aging Effects Requiring Management	Program/Activity
Internal Environment					
Valves (strainer bypass, strainer backwash, and spent fuel pool makeup)	Pressure boundary	Carbon steel Cast iron (Unit 1 only)	Raw water – salt water	Loss of material	Systems and Structures Monitoring Program Intake Cooling Water Inspection Program
Piping/fittings (strainer bypass, strainer backwash, and spent fuel pool makeup) [VII C1. 1.1]	Pressure boundary	Stainless steel	Raw water – salt water	Loss of material	Systems and Structures Monitoring Program Intake Cooling Water Inspection Program
Piping/fittings (strainer bypass, strainer backwash, and spent fuel pool makeup)	Pressure boundary	Stainless steel	Air/gas	None	None required
		Carbon steel	Raw water – salt water	Loss of material	Systems and Structures Monitoring Program Intake Cooling Water Inspection Program
Valves (vents, drains, and instrumentation) [VII C1. 2.1]	Pressure boundary	Stainless steel Aluminum bronze Bronze	Raw water – salt water	Loss of material	Systems and Structures Monitoring Program Intake Cooling Water Inspection Program

Valves (vents, drains, and instrumentation)	Pressure boundary	Carbon steel Monel	Raw water – salt water	Loss of material	Systems and Structures Monitoring Program Intake Cooling Water Inspection Program
Piping/fittings (vents, drains, and instrumentation) [VII C1. 1.1]	Pressure boundary	Stainless steel Aluminum bronze	Raw water – salt water	Loss of material	Systems and Structures Monitoring Program Intake Cooling Water Inspection Program
Piping/fittings (vents, drains, and instrumentation)	Pressure boundary	Carbon steel Aluminum brass Monel	Raw water – salt water	Loss of material	Systems and Structures Monitoring Program Intake Cooling Water Inspection Program
		Fiberglass (Unit 2 only)	Raw water – salt water	Cracking	Systems and Structures Monitoring Program Intake Cooling Water Inspection Program
Tubing/fittings	Pressure boundary	Stainless steel	Raw water – salt water	Loss of material	Systems and Structures Monitoring Program Intake Cooling Water Inspection Program

RAI 3.3.15 - 1

In Table 3.3.15, “Ventilation,” the applicant identifies, for the control room air-conditioning subsystem, loss of material as an applicable aging effect for the carbon steel filter housing, which is internally exposed to an air/gas environment, but not for carbon steel component valves and piping/fittings that are exposed to the same environment. Please explain this discrepancy.

FPL Response

The response below supercedes the response to RAI 3.3.15-1 transmitted in FPL Letter
L-2002-159 dated September 26, 2002. This response is being revised to describe the use of the MCIC report referenced in the response.

The carbon steel valves and piping/fittings identified in LRA Table 3.3-15 (pages 3.3-75 and 3.3-76) exposed to an air/gas environment are associated with Unit 1 Control Room Air Conditioning outside air intake. The internal air/gas environment for the piping and valves is outside air. As discussed in LRA Appendix C, Section 5.1 (page C-11) carbon steel is considered susceptible to loss of material due to general corrosion in this environment. As such, the aging management review of these components evaluated the potential impact of this aging effect on component intended function. Unlike the carbon steel ventilation housings which are constructed of heavy gage sheet metal, the carbon steel piping evaluated is schedule 40 and has a nominal thickness of 0.280 inches. The valves, which are wafer-type butterfly valves, have a body thickness greater than one inch. Utilizing conservative corrosion rates for Steel category “A”, "Inland" environment, and "Average Reduction in Thickness, mils" from Tables 6-1 and F-1 of MCIC Report, July,1986, "Corrosion of Metals in Marine Environment" by J. A. Beavers, G. H. Koch and W. E. Berry, the worst case internal loss of material is calculated to be 76 mils (3 mils/year x 8 years + 1 mil/year x 52 years) over the life of the plant. The “Average Reduction in Thickness” column is applicable since the aging mechanism of concern for the internal surfaces of the Control Room Air Conditioning outside intake valves/piping/fittings is general corrosion and thus, uniform loss of material is expected. Note that due to the location of these components and their limited air exchange with the environment, aggressive chemical species will not be present and significant pitting corrosion is not expected. The "Inland" environment data is applicable based upon expected conditions for the air space inside the Control Room Air Conditioning intake components. The Control Room Air Conditioning outside intake line is located inside the Reactor Auxiliary Building and is normally isolated. Thus, high humidity of inland tropical environment without aggressive species, such as chlorides is applicable. Based upon the above, the corrosion rate as derived from Table 6-1 is 2.8 mils for the first year, 2.3 mils for the second year (i.e., 5.1 cumulative), 3.2 mils for the third and fourth years (i.e. 8.3 cumulative), and approximately 1.1 for each of the next 4 years (i.e., 12.6 mils total for 8 years). For conservatism, a corrosion rate of 3 mils/year was assumed for the first 8 years, followed by a

1 mil/year corrosion rate for the remainder of plant life.

These corrosion rates are based upon comprehensive evaluations of corrosion damage to steel exposed to tropical atmosphere in the Panama Canal Zone. As expected, the corrosion rate decreases with time due to the buildup of an oxidation layer which will tend to provide some protection of the bare metal underneath. Thus, based upon this worst case corrosion rate, the remaining piping wall thickness is 0.204 inches. Since this portion of the ventilation system is non-pressurized, the remaining wall thickness must only address structural loads and it is concluded that adequate corrosion allowance exists for these components. Therefore, loss of material due to corrosion of the internal surfaces of valves, piping, and fittings associated with the Control Room Air Conditioning outside air intake (which are exposed to an air/gas environment) is not an aging effect requiring management.

RAI 3.5 - 1

Considering the vulnerability of concrete structural components, the staff has required previous license renewal applicants to implement an aging management program to manage the aging of these components. The staff's position is that cracking, loss of material, and change in material properties are plausible and applicable aging effects for concrete components inside containment, as well as for other structures outside containment. For inaccessible concrete components, the staff does not require aging management if the applicant is able to show that the soil/water environment is nonaggressive; however, the staff requires inspection through an aging management program for all other concrete components. Provide justification for concluding that there are no applicable aging effects for (1) reinforced concrete walls, slabs, trenches, foundations, shields, and roofs above groundwater in outdoor and containment air environments and (2) reinforced concrete interior shield walls, beams, slabs, missile shields, and equipment pads inside containment.

FPL Response

The response below supercedes the response to RAI 3.5-1 transmitted in FPL Letter L-2002-157 dated September 26, 2002. This response is being revised to clarify the aging effects requiring management for concrete components.

The analysis of possible aging effects for reinforced concrete components in the Containments and Other Structures are summarized in the LRA Subsections 3.5.1.3 and 3.5.2.3 (pages 3.5-9 and 3.5-24, respectively). The analysis is based on concrete material properties, the applicable environments, and years of operating experience. The analysis concludes that concrete structures exposed to aggressive environments require aging management, and concrete structures not exposed to aggressive environments do not require aging management.
However, based on specific direction from the NRC staff, license renewal applicants are required to implement an aging management program to manage aging of concrete structures. FPL proposes to credit the Systems and Structures Monitoring Program (LRA Appendix B Subsection 3.2.14 page B-57) for managing aging (including cracking, loss of material, and change in material properties) of the accessible reinforced concrete structures listed in LRA Tables 3.5-2 through 3.5-16 (pages 3.5-35 through 3.5-93).

RAI 3.6 - 2

Exposure of electrical cables to localized environments caused by heat, radiation, or moisture can result in reduced insulation resistance (IR). Reduced IR causes an increase in leakage currents between conductors and from individual conductors to ground. A reduction in IR is a concern for circuits with sensitive, low-level signals such as radiation monitoring and nuclear instrumentation since it may contribute to inaccuracies in the instrument loop. Visual inspection may not be sufficient to detect aging degradation from heat, radiation, or moisture in the instrumentation circuits with sensitive, low-level signals. Because low-level signal instrumentation circuits may operate with signals that are normally in the pico-amp or less, they can be affected by extremely low levels of leakage current. These low levels of leakage current may affect instrument loop accuracy before the adverse localized changes are visually detectable. Routine calibration tests performed as part of the plant's surveillance test program can be used to identify the potential existence of this aging degradation. Provide a description of your aging management program that will be relied upon to detect this aging degradation in sensitive, low-level signal circuits.

FPL Response

The response below supercedes the response to RAI 3.6-2 transmitted in FPL Letter L-2002-157 dated September 26, 2002. This response is being revised to clarify that cables associated with radiation monitors are managed by the Environmental Qualification (EQ) Program.

The aging management reviews performed by FPL on non-EQ cables and connections determined that there were no aging effects that require management for the extended period of operation. These reviews included an assessment of aging degradation of non-EQ cables and connections associated with sensitive, low-level signal circuits. A review of plant-specific operating experience performed as part of these aging management reviews (see LRA Subsection 3.6.2.2, page 3.6-9), which included a review of instrument calibration results and discussions with St. Lucie plant maintenance and engineering personnel, indicated that no failures of cables and connections associated with sensitive, low-level signal circuits have occurred due to aging.

As stated in FPL's response to RAI 3.6-1, the only non-EQ cables and connections associated with sensitive, low-level signal circuits within the scope of license renewal for St. Lucie are those associated with the source, intermediate and power range neutron detectors. Note that the containment radiation monitors and associated cables (both inside and outside the Containments) for St. Lucie Units 1 and 2 are managed by the EQ Program.

FPL does not consider an additional aging management program to address sensitive, low-level signal circuits to be necessary for the following reasons:

As noted above, the aging management reviews performed determined there were no aging effects requiring management.

26 and 19 years of operating experience at St. Lucie Units 1 and 2, respectively, have not identified the need for an aging management program tailored for non-EQ cables and connections associated with sensitive, low-level signal circuits.

The Electrical Cable and Terminations Aging Management Guideline, SAND96-0344 (LRA Reference 3.6-1), concludes in Section 1.4 that "… reliance on visual inspection techniques for the assessment of low-voltage cable and termination aging appears warranted since these techniques are effective at identifying degraded cables."

Additionally, a review of other license renewal Safety Evaluation Reports indicates acceptance of visual inspections for managing aging of cables and connections.

However, based on discussions with the NRC in public meetings on September 4 and 5, 2002, FPL has included activities in the aging management program proposed in the response to RAI 3.6-1 to address aging of the sensitive circuits associated with the source, intermediate and power range neutron detectors. The results of routine calibration tests for these circuits will be used to facilitate detection of adverse localized environments. See FPL's response to RAI 3.6-1 for further details.

RAI B.3.1.2 - 1

In Section 3.1.2, “Galvanic Corrosion Susceptibility Inspection Program,” of Appendix B to the LRA, the applicant states that inspections will be conducted on a sampling basis. Locations selected for inspection will represent those with the greatest susceptibility to galvanic corrosion. However, there are insufficient details in the LRA concerning the program for the NRC staff to determine with reasonable assurance that the program is acceptable. Provide additional information concerning the existing program or the planned development of the program elements in the following areas:

Explain how the greatest susceptibility locations will be determined including whether these locations will be selected for each system or for all the systems.

Explain what documents or information will be used to define the inspection interval, sample size, inspection criteria, and corrective actions.

Explain how information concerning the inspections of the susceptible locations, the results of the inspections, and corrective actions will be managed, tracked, and evaluated.

FPL Response

The response below supercedes the response to RAI B.3.1.2-1 transmitted in FPL Letter
L-2002-166 dated September 26, 2002. This response is being revised to specifically address environments for the other systems (Instrument Air, Ventilation, and Fire Protection).

Significant galvanic corrosion has not been experienced and is not anticipated in treated water systems due to the high purity of the water and its low conductivity. The Galvanic Corrosion Susceptibility Inspection Program (LRA Appendix B Subsection 3.1.2 page B-11) was developed to quantify the significance of loss of material due to this corrosion mechanism and provide for managing the effects of aging, if required. This program constitutes a one-time inspection of selected locations various systems which have been identified as potentially susceptible. The majority of these systems have internal environments of treated water. The other systems have internal environments of condensed atmosphere in portions of Instrument Air and Ventilation, and "raw water - city water" in Fire Protection. As stated in LRA Appendix C, Section 4.1.2 (page C-7), “raw water – city water” is potable water. The water has been rough filtered to remove large particles. City water has been purified but conservatively classified as raw water for the purposes of aging management review.

First Bullet

Since the inspection of all locations with the potential for galvanic corrosion is not practical, an engineering specification will be developed to provide the methodology for identifying those galvanic couples where corrosion is most likely to occur and where inspection results can be used to bound less susceptible locations. This engineering specification will also provide methods for conducting inspections, evaluation of inspection data and documentation of results. Selection of locations with greatest susceptibility to galvanic corrosion is based upon the following:

How far apart the two dissimilar metals are on the galvanic series chart. The further apart, the higher the corrosion rate. Note that all stainless steels addressed by the Galvanic Corrosion Susceptibility Inspection Program are considered "passive" as described in ASTM Standard G 82-98, "Development and Use of a Galvanic Series for predicting Galvanic Corrosion performance". As previously discussed, this program addresses the potential for galvanic corrosion in treated (high purity) water systems. Stainless steels in this environment will develop and maintain a passive protective oxide coating.

The conductivity of the electrolyte. The more conductive the electrolyte, the higher the corrosion rate.

The relative size of the anode and cathode. A smaller anode surface area will result in a larger corrosion rate.

The overall susceptibility of each galvanic couple in each system is assessed and ranked based upon consideration of each of the above factors. Those with greatest susceptibility are then recommended for inspection. Those that are not selected for inspection are verified to be bounded based upon electrical potential of dissimilar materials, purity of water (i.e., conductivity), and relative size of anode and cathode. For those cases where the combination of two influencing factors do not provide a conclusive ranking, the particular galvanic cell is selected for inspection. The selection process will ensure that a variety of environments are addressed by inspection including treated water - other, borated water, raw water - city water (fire protection), and air/ gas - wetted air (condensation). Where possible, inspection of galvanic couples will be included as part of plant maintenance activities.

Second Bullet

The results of the initial inspections will be assessed to determine the need for follow-up inspections. Although not anticipated, for any case where loss of material is identified, the scope and frequency of follow-up inspections will be based upon the measured wall thickness, calculated corrosion rate, projected wall thickness, and will ensure the minimum required wall thickness is maintained pursuant to the applicable code requirements. (See FPL responses to RAIs B.3.1.3-1 and B.3.1.3-2.)

Third Bullet

The results of the one-time inspection will be documented in accordance with the Corrective Action Program as discussed in LRA Appendix B Section 2.0 (page B-5).

RAI B.3.2.5 - 2

In Section 3.2.5.1 of Appendix B to the LRA, the applicant states that the Water Chemistry Control Subprogram was developed in accordance with the guidance in TR-107396, "Closed Cycle Cooling Water System," published October 1997 by the Electric Power Research Institute (EPRI) and is consistent with the 10 attributes of the AMP X1.M21, "Closed-Cycle Cooling Water System,"" in the Generic Aging Lessons Learned (GALL) report, with the exception that this subprogram does not address surveillance testing and inspection. The applicant further states that the Intake Cooling Water Inspection Program implements the applicable surveillance testing and inspection aspects of the GALL program. The Intake Cooling Water Inspection Program includes inspection of only those closed-cycle cooling water (CCW) system components that are exposed to raw water, which are the CCW heat exchanger tubes, tubesheet channels, and doors. The GALL report recommends inspecting these components and other CCW system components, which are exposed to treated water and susceptible to loss of material. Explain this discrepancy between the Chemistry Control Program, as descriptions in Section 3.2.5.2 of Appendix B to the LRA and the AMP X1.M21 in the GALL report.

FPL Response

The response below supercedes the response to RAI B.3.2.5-2 transmitted in FPL Letter
L-2002-166 dated September 26, 2002. This response is being revised to provide additional St. Lucie plant-specific operating experience.

Aging Management Program (AMP) X1.M21, "Closed-Cycle Cooling Water System," of the Generic Aging Lessons Learned (GALL) Report states that the aging management program monitors the effects of corrosion by surveillance testing and inspection (in accordance with standards in EPRI TR-107396, "Closed Cycle Cooling Water System") to evaluate system and component performance. The existing St. Lucie Chemistry Control Program – Closed-Cycle Cooling Water System Subprogram (LRA Appendix B Subsection 3.2.5.2, page B-33), in conjunction with the Intake Cooling Water System Inspection Program (LRA Appendix B Subsection 3.2.10, page B-43) and periodic surveillance testing is consistent with the GALL Closed-Cycle Cooling Water System Program with respect to parameters monitored or inspected. The parameters monitored by the Chemistry Control Program – Closed-Cycle Cooling Water System Subprogram for the purposes of License Renewal aging management are based on the recommendations of EPRI TR-107396. Non-chemistry parameters monitored by periodic surveillance testing include pump flow and discharge and suction pressures, heat exchanger flow and inlet and outlet temperatures, and emergency diesel generator performance. The component cooling water heat exchangers are periodically inspected under the Intake Cooling Water System Inspection Program.

As part of the aging management review process for Component Cooling Water, a review of St. Lucie plant-specific operating experience was performed to identify any age related material failures/degradations associated with corrosion due to inadequate chemistry controls. The results of the review identified no instances of material failures or degradation, which supports evidence of an effective chemistry control program. Note that many component cooling water components have been inspected in the past as part of corrective maintenance or the preventive maintenance program (e.g., periodic pump overhauls). During the past 12 months, more than thirty maintenance work orders were generated for Units 1 and 2 Component Cooling Water that require disassembly or removal of components. These work orders include repairs on instrumentation and other isolation valves, flow control valves, and check valve and relief valve internals inspections throughout the system. A majority of these components (e.g., relief and isolation valves) entail system locations where stagnant flow conditions exist. The internal condition of the components has provided additional confidence that the Chemistry Control Program – Closed-Cycle Cooling Water System Subprogram is effective.

As discussed in the response to RAI 3.3.2-1, maintenance procedures typically specify inspection criteria or reference plant quality instructions that specify internal cleanliness requirements. See RAI 3.3.2-1 for additional information regarding maintenance inspection requirements. Any significant degradation identified during these inspections would have been documented under the plant corrective action program. As such, the St. Lucie Chemistry Control Program – Closed-Cycle Cooling Water System Subprogram was determined to be an effective program and the need for additional inspections of other component cooling water components specifically to confirm program effectiveness was determined to be unnecessary.