February 13, 2013

L-2013-066
10 CFR 50.4
10 CFR 50.55a

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

Re: St. Lucie Unit 2
Docket No. 50-389
Inservice Inspection Plan
Third Ten-Year Interval Unit 2 Relief Request No. 9, Revision 0

In accordance with 10 CFR 50.55a(a)(3)(ii), Florida Power & Light (FPL) requests relief from the extended pressure test boundaries of IWB-5222(b) imposed during the System Leakage Test conducted at or near the end of the inspection interval. St. Lucie Plant intends to use the alternative boundaries permitted by Code Case N-798 for Class 1 vents and drains, and Code Case N-800 for Class 1 piping between the first and second injection valves to satisfy the requirements for examination of Class 1 components at the end of the interval.

FPL requests approval prior to the spring 2014 Unit 2 refueling outage, SL2-21.

Please contact Ken Frehafer at (772) 467-7748 if there are any questions about this submittal.

Sincerely,

Eric S. Katzman
Licensing Manager
St. Lucie Plant

Attachment
ESK/KWF

A047
NRR

Proposed Alternative in Accordance with 10 CFR 50.55a(a)(3)(ii)

--Hardship or Unusual Difficulty without Compensating Increase in Level of Quality or Safety--

1. ASME Code Component(s) Affected

St. Lucie Unit 2 Class 1 Piping, Category B-P, Item #B15.50 and B15.70, Pressure Retaining Components. Specific items are identified in Table 1 and Table 2 of this relief request.

2. Applicable Code Edition and Addenda

The American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Rules for Inservice Inspection of Nuclear Power Plant Components, Section XI, 1998 Edition with Addenda through 2000 as amended by 10CFR50.55a, is the code of record for the St. Lucie Unit 2, 3rd 10-year interval.

3. Applicable Code Requirement

Exam Cat.	Item No.	Examination Description
B-P	B 15.50	Piping - Pressure Retaining Boundary, including RCS, Safety Injection and Shutdown Cooling process piping, vents, and drains as noted on Table 1 and Table 2.
	B 15.70	Valves - Pressure Retaining Boundary, including RCS, Safety Injection and Shutdown Cooling process, vent, and drain isolation valves as noted on Table 1 and Table 2.

Table IWB-2500-1, Examination Category B-P, establishes the requirement to conduct a System Leakage Test (IWB-5220) prior to plant startup following each refueling outage. IWB-5221 requires that the System Leakage test shall be conducted at the pressure corresponding to 100% rated reactor power. By IWB-5222(a), the pressure retaining boundary shall correspond to the reactor coolant boundary with all valves in the position required for normal reactor operation startup. In accordance with IWB-5222(b), the pressure retaining boundary during the system leakage test conducted at or near the end of each inspection interval shall extend to all Class 1 pressure retaining components within the system boundary.

Relief is requested from the extended pressure test boundaries of IWB-5222(b) imposed during the System Leakage Test conducted at or near the end of the inspection interval. St. Lucie Plant intends to use the alternative boundaries permitted by Code Case N-798 for Class 1 vents

and drains, and Code Case N-800 for Class 1 piping between the first and second injection valves to satisfy the requirements for examination of Class 1 components at the end of the interval.

4. Reason for Request

Pursuant to the provisions of 10 CFR 50.55a(a)(3)(ii), FPL requests approval to perform the examination of select Class 1 piping and valves at plant conditions other than those required by the ASME Code. Relief is requested in accordance with 10 CFR 50.55a(a)(3)(ii) on the basis that hardship and unusual difficulty exists in establishing a system configuration that will subject all Class 1 components to RCS pressure during the system pressure test without a compensating increase in the level of quality and safety. Extending the pressure retaining boundary during system pressure test to all Class 1 pressure retaining components within the system boundary will require a number of temporary system alterations, temporary piping installations, and control logic alterations.

Table 1 identifies the Class 1 pressure retaining components associated with the requested relief that will remain in their normal operating configuration and will not be pressurized during the system leakage test.

The Class 1 vents and drains in the Reactor Coolant System are equipped with inboard isolation valves and outboard blind flanges which provide double isolation of the Reactor Coolant Pressure Boundary (RCPB). The valves are maintained in the closed position during normal plant operation, and the downstream pipe and blind flange are not normally pressurized. To pressurize those piping segments as required by IWB-5222(b), it would be necessary to manually open the inboard valves to pressurize the piping and connections. Pressurization by this method defeats the double isolation and reduces the margin of personnel safety for those performing the test. Furthermore, performing the test with the inboard isolation valves open requires several man-hours to position the valves for the test and restore the valves to their closed positions once the test is completed. These valves are located in close proximity to the RCS loop piping and thus would require personnel entry into high radiation areas within the containment and a consequent increase in radiation exposure. In addition, there is no way to depressurize the downstream piping following test completion. Thus, compliance with this specific Code requirement results in unnecessary hardship pursuant to 10CFR50.55a(a)(3)(ii) without a compensating increase in the level of quality and safety.

Table 2 identifies the Class 1 pressure retaining components associated with the requested relief that will remain in their normal operating configuration and will not be pressurized to RCS system pressure during the system leakage test, but will be examined at full operating pressures commensurate with their respective safety functions.

Design of some St. Lucie Class 1 process piping requires substantial effort to extend the

boundary subject to RCS pressure where check valves or non-redundant components serve as the first system isolation from the reactor coolant system. Such configurations may require temporary piping installations, such as hard-pipe jumpers, and/or other unusual temporary system configurations in order to achieve test pressures at upstream piping and valves as required by IWB-5222(b). Since the Class 1 system pressure testing is performed in Mode 3, these temporary configurations could conflict with Technical Specification requirements. Establishing and restoring such temporary configurations could also result in an unwarranted increase in worker radiation exposure.

Based on the above, extension of the boundary subjected to RCS pressure during system leakage tests to include all Class 1 pressure retaining components within the system boundary in accordance with IWB-5222(b) represents a hardship and unusual difficulty that does not provide a compensating increase in the level of quality and safety provided by the examination.

The following is specific information pertaining to the various pipe segments identified in Table 1 and Table 2 for which relief has been requested.

Small Bore Class 1 RCS Vent and Drain Lines

Relief is requested from pressurizing piping between the first and second isolation device on small size vent and drain lines. There are nine Class 1 vent or drain lines in the Reactor Coolant System (RCS) identified in Table 1, ranging in size from 3/4 inch to two inches. Eight of these consist of an inboard isolation valve and a blind flange in series. One 3/4 inch segment consists of two valves in series. The piping segments provide the design-required double isolation barrier for the reactor coolant pressure boundary. The Code-required leakage test would be performed in MODE 3 at the normal operating pressure of 2250 psia and at a nominal temperature of 532°F. Leakage testing of these piping segments at nominal operating pressure in MODE 3 would require the opening of the inboard isolation valve at the normal operating RCS temperature and pressure conditions. In so doing, the design requirement for two primary coolant pressure boundary isolation devices would be violated. Additionally, opening these valves introduces the potential risk for spills and personnel contamination, and there is no way to depressurize the eight blind flanges at the completion of the examination.

These piping segments are included in the exam population for VT-2 examination through the entire length as part of the Class 1 system inspection at the conclusion of each refueling outage. The leakage test will not specifically pressurize past the first isolation valve for this inspection. No external or visible leakage will be allowed. Since this type of test will assure that the combined first and second isolation devices are effective in maintaining the reactor coolant pressure boundary at normal operating temperature and pressure, the increase in safety achieved from the Code-required leakage test is not commensurate with the hardship of performing such testing.

Large Bore Class 1 Safety Injection and Shutdown Cooling Piping Segments

Hot Leg Shutdown Cooling Suction

There are two 10 Inch Hot Leg Shutdown Cooling Suction lines, one from each Hot Leg, identified on Table 2. These piping segments consist of short segments of piping between the two Shutdown Cooling Suction valves on each train of the system. These valves are interlocked at a required setpoint below 350 psig, and administratively controlled to be closed at a pressure not to exceed 275 psia to avoid over-pressurization of the Shutdown Cooling System. The interlock prevents manual opening of the valves from the Control Room with RCS pressure above the setpoint. The piping segment is VT-2 inspected through the entire length as part of the Class 1 system inspection at the conclusion of each refueling outage, as well as when the Shutdown Cooling System is in service. The proposed system pressure test will not specifically pressurize past the first isolation valve for this inspection. It is possible that the piping becomes pressurized due to minor leakage past the first isolation valve. No external or visible leakage will be allowed for the test to be acceptable. This test will provide assurance that the combined first and second isolation valves are effective in maintaining the reactor coolant pressure boundary at normal operating temperature and pressure.

HPSI/Hot Leg Injection

These large bore piping segments, identified on Table 2, provide the flow path for Hot Leg Safety Injection into the RCS. The primary isolation devices are the two 3-inch check valves oriented to flow into the RCS. The piping segments provide the design-required double isolation barrier for the reactor coolant pressure boundary. These lines are visually examined both during the RCS system leakage test as Class 1 boundary lines, and during the High Pressure Safety Injection System functional pressure test conducted at HPSI Pump discharge pressure in accordance with the requirement to examine systems at their highest operating pressure.

Leakage testing at RCS pressure would require a pressure source be connected at each segment location by way of temporary piping connections and/or unusual temporary system configurations which would challenge both the header check valves in the auxiliary building and the loop check closure at the RCS connection. In so doing, the design requirement for two primary coolant pressure boundary isolation devices would be violated. For test locations located overhead and away from normal personnel access areas, ladders or scaffolding would have to be installed to provide access to the piping segment and to open the valve. This process would lead to the occupational dose associated with leakage testing these lines.

These lines are located in areas involving occupational radiation exposure, and leakage testing of these lines would increase occupational radiation dose. Restoration of temporary

configurations to normal operating conditions would be hazardous to personnel and lead to excess occupational dose without a commensurate increase in the quality and safety of the system.

5. Proposed Alternative and Basis for Use

Proposed Alternative:

Relief is requested from the extended pressure test boundaries of IWB-5222(b) imposed during the System Leakage Test conducted at or near the end of the inspection interval. St. Lucie Plant intends to use the alternative boundaries permitted by Code Case N-798 for Class 1 vents and drains, and Code Case N-800 for Class 1 piping between the first and second injection valves to satisfy the requirements for examination of Class 1 components at the end of the interval.

For those portions of Class 1 vent and drain lines between the first and second isolation devices that normally remain closed during plant operation, FPL will conduct the required end of interval system pressure tests as prescribed by Table IWB-2500-1, Examination Category B-P, using the alternatives of Code Case N-798; only the boundaries of IWA-5222(a) will apply.

For those portions of the Class 1 boundary between the first and second isolation valves in the injection and return path of standby safety systems, FPL will conduct the required end of interval system pressure tests as prescribed by Table IWB-2500-1, Examination Category B-P, using the alternatives of Code Case N-800; the system leakage test will be conducted by pressurization of the Class 1 volume using the Class 2 safety system to pressurize the volume. The system leakage test will be conducted using the pressure associated with the Class 2 system function that provides the highest pressure between the Class 1 isolation valves

Basis for Use:

The objective of the required visual examination at normal operating conditions is to detect evidence of leakage and thereby verify the integrity of the RCS pressure boundary. FPL believes the same evidence of leakage can be identified by visual examination of all portions of the Class 1 systems at their own normal operating pressures without subjecting the standby systems and secondary boundaries to unusual alignments and excess pressure.

Therefore, FPL concludes that the proposed alternative provides reasonable assurance of system integrity and an acceptable level of quality and safety comparable to an exam performed at normal operating conditions.

6. Duration of Proposed Alternative

The proposed alternative will be implemented for the remainder of the Third Inspection Interval which ends August 7, 2013.

7. Precedents

A similar request for relief was approved for St. Lucie Unit 1 during the 3rd inspection interval (TAC NO MD5145)

Table 1: Relief Request Number 9
Affected Class 1 Pressure Retaining Components — Examination Category B-P

Affected Line or Component	Pipe Diameter (in.)	Pipe Schedule	Approx Length (ft.)	Drawing No.	Boundary Exception(s)
Loop 2A1 Drain	2	SCH 160 304 SS	< 1 ft.	2998-G-078, Sheet 110	Valve V1235 remains closed to avoid pressurizing downstream Class 1 pipe to blind flange.
Loop 2A2 Drain	2	SCH 160 304 SS	< 1 ft.	2998-G-078, Sheet 110	Valve V1234 remains closed to avoid pressurizing downstream Class 1 pipe to blind flange.
Loop 2B1 Drain	2	SCH 160 304 SS	< 1 ft.	2998-G-078, Sheet 110	Valve V1450 remains closed to avoid pressurizing downstream Class 1 pipe to blind flange.
Loop 2B2 Drain	2	SCH 160 304 SS	< 1 ft.	2998-G-078, Sheet 110	Valve V1449 remains closed to avoid pressurizing downstream Class 1 pipe to blind flange.
A Hot Leg Drain	1	SCH 160 304 SS	0.5 ft.	2998-G-078, Sheet 110	Valve V1215 remains closed to avoid pressurizing downstream Class 1 pipe to blind flange.
B Hot Leg Drain	2	SCH 160 304 SS	0.5 ft.	2998-G-078, Sheet 110	Valve V1247 remains closed to avoid pressurizing downstream Class 1 pipe to blind flange
A Hot Leg Refueling Level Indicator	3/4	SCH 160 304 SS	1.5 ft.	2998-G-078, Sheet 110	Valve V1214 remains closed to avoid pressurizing downstream Class 1 pipe to valve V1505 and orifice SO-01-63.
Vent on Pressurizer Spray 2B1	3/4	SCH 160 304 SS	.05 ft.	2998-0-078, Sheet 109	Valve V1456 remains closed to avoid pressurizing downstream Class 1 pipe to blind flange.
Vent on Pressurizer 2B2	3/4	SCH 160 304 SS	0.5 ft.	2998-G-078, Sheet 109	Valve V1455 remains closed to avoid pressurizing downstream Class 1 pipe to blind flange.

TABLE 2: RELIEF REQUEST NUMBER 9 AFFECTED CLASS 1 PRESSURE RETAINING COMPONENTS — EXAMINATION CATEGORY B-P					
Affected Line or Component	Pipe Diameter (in.)	Pipe Schedule	Approx Length (ft)	Drawing No.	Boundary Exception(s)
A Hot Leg Shutdown Cooling Suction 2998-G-078, Sheet 131 Valve V3480 is interlocked closed @350 psig.					
SI-127	10	SCH 160 304 SS	20 ft.	*SI-N-17	Class 1 pipe to valve V3481
SI-378	10	SCH 160 304 SS	20 ft	*SI-N-17	Class 1 pipe to valve V3545
SI-152	2	SCH160 304 SS	<.5 ft	**SI-98	Class 1 pipe to cap
SI-201	3/4	SCH 160 304 SS	<1 ft.	**SI-97	Class 1 pipe to relief valve V3482
SI-283	1	SCH 160 304 SS	<1 ft.	**SI-64	Class 1 pipe to drain valve V3841
B Hot Leg Shutdown Cooling Suction 2998-G-078,Sheet 131 Valve V3652 is interlocked closed @350 psig.					
SI-130	10	SCH 160 304 SS	18 ft,	*SI-N-19	Class 1 pipe to valve V3651
SI-378	10	SCH 160 304 SS	33 ft,	*SI-N-19	Class 1 pipe to valve V3545
SI-153	2	SCH 160 304 SS	<.5 ft.	**SI-99	Class 1 pipe to cap
SI-135	3/4	SCH 160 304 SS	<1 ft.	**SI-96	Class 1 pipe to relief valve V3469
SI-226	1	SCH 160 304 SS	<1 ft.	**SI-64	Class 1 pipe to vent valve V3800

TABLE 2: RELIEF REQUEST NUMBER 9 AFFECTED CLASS 1 PRESSURE RETAINING COMPONENTS — EXAMINATION CATEGORY B-P					
A Hot Leg Injection 2998-G-078,Sheet 131 Valve V3525 is a Check Valve					
SI-190	3	SCH 160 304 SS	8 ft.	*SI-N-20	Class 1 pipe between valves
SI-197	3/4	SO-03-13 304 SS	<1 ft.	**SI-65	Pipe to PT-3310
SI-198	1	SCH 160 304 SS	<1 ft.	**SI-65	Pipe to drain valve V3542
SI-535	1	SCH 160 304 SS	77 ft.	**SI-71 **SI-72	Pipe to control valve V3572
SI-593	3/4	SCH 160 304 SS	<1 ft.	**SI-72	Pipe to vent valve V3708
SI-594	3/4	SCH 160 304 SS	<1 ft.	**SI-72	Pipe to drain valve V3709
B Hot Leg Injection 2998-G-078,Sheet 131 Valve V3527 is a Check Valve					
SI-191	3	SCH 160 304 SS	9 ft.	*SI-N-21	Class 1 pipe between valves
SI-372	3/4	SO-03-14 304 SS	<1 ft.	**SI-65	Pipe to PT-3320
SI-373	1	SCH 160 304 SS	<1 ft.	**SI-65	Pipe to drain valve V3544
SI-533	1	SCH 160 304 SS	68 ft.	**SI-86 **SI-87	Pipe to control valve V3571
SI-596	3/4	SCH 160 304 SS	<1 ft.	**SI-87	Pipe to vent valve V3710
SI-597	3/4	SCH 160 304 SS	<1 ft.	**SI-87	Pipe to drain valve V3711

*denotes Large Bore Isometric 2998-G-125 series drawing

**denotes Small Bore Isometric 2998-C-124 series drawing