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10 CFR 50.4
10CFR 50.55a

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

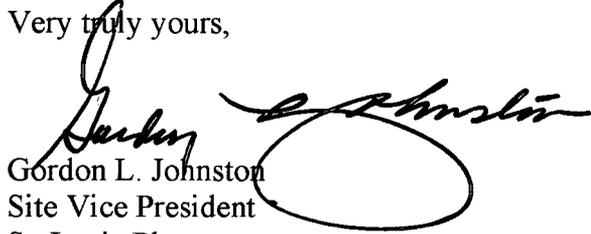
Re: St. Lucie Unit 1
Docket No. 50-335
Fourth Ten-Year Interval Unit 1 Relief Request 1
RAI Reply (TAC MD8041)

Via FPL letter L-2007-195 dated December 7, 2007, pursuant to 10 CFR 50.55a (a)(3)(i), FPL requested to revise the St. Lucie Unit 1 ISI Program, for Class 1 piping only, through the use of a Risk-Informed Inservice Inspection Program (RI-ISI) as an alternative to the current requirements of Class 1 examination Categories B-F and B-J as specified in Table IWB-2500-1 of the 2001 Edition with 2003 Addenda of ASME Section XI.

The NRC Staff requested additional information to support review of the relief request in ADAMS Accession # ML082050619. The attachment to this letter revises the relief request to address the PWSCC damage mechanism separately from RI-ISI by use of an augmented program (MRP-139) that includes its own selection criteria and response to degradation identification. Additionally, during a NRC/FPL teleconference held on August 6, 2008, the NRC Staff requested information concerning the risk model. The attachment also addresses this issue.

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

Very truly yours,


Gordon L. Johnston
Site Vice President
St. Lucie Plant

Attachment

GLJ/KWF

A047
NER

**St. Lucie Unit 1
FOURTH INSPECTION INTERVAL
RELIEF REQUEST NUMBER 1 REV. 1**

**Proposed Alternative
In Accordance with 10 CFR 50.55a(a)(3)(i)**

--Alternative Provides Acceptable Level of Quality and Safety--

1. ASME Code Components Affected

Class 1 pressure retaining similar and dissimilar metal piping welds

Exam Cat.	Item No.	Examination Description
B-F	B5.40	Pressurizer- NPS 4 or larger, Nozzle-to-Safe End Butt Welds
	B5.50	Pressurizer- Less than NPS 4, Nozzle-to-Safe End Butt Welds
B-J	B9.11	Piping- NPS 4 or Larger, Circumferential Welds
	B9.21	Piping- Less than NPS 4, Circumferential Welds other than PWR high pressure safety injection systems
	B9.22	Piping- Less than NPS 4, Circumferential Welds of PWR high pressure safety injection systems
	B9.31	Piping- Branch Pipe Connection Welds, NPS 4 or Larger
	B9.32	Piping- Branch Pipe Connection Welds, Less than NPS 4
	B9.40	Piping- Socket Welds

2. Applicable Code Edition and Addenda

Inservice inspections (ISI) are performed on piping to the requirements of the ASME Boiler and Pressure Vessel Code Section XI, 2001 Edition with 2003 Addenda as required by 10CFR50.55a.

3. Applicable Code Requirement

Pursuant to 10 CFR 50.55a (a)(3)(i), FPL requests to revise the St. Lucie Unit 1 ISI Program, for Class 1 piping only, through the use of a Risk-Informed Inservice Inspection Program (RI-ISI) as an alternative to the current requirements of Class 1 examination Categories B-F and B-J as specified in Table IWB-2500-1 of the 2001 Edition with 2003 Addenda of ASME Section XI.

The proposed revision to the ISI program, for Class 1 piping only, is based on the risk-informed process described in Westinghouse Owners Group WCAP-14572, Revision 1-NP-A, "Westinghouse Owners Group Application of Risk-Informed Methods to Piping Inservice Inspection Topical Report." A similar revision to the third interval ISI program was submitted

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by letter dated July 30, 2003, as supplemented by letters dated December 4, 2003, and January 28, 2004, and was approved by SER dated March 25, 2004 (TAC No. MC0244). This request for alternative utilizes the identical methodology that was previously approved.

St. Lucie Unit 1 is entering the fourth interval as defined by the Code for Program B. The fourth inspection interval for St. Lucie Unit 1 begins February 11, 2008 and ends February 10, 2018.

4. Reason for Request

The objective of this submittal is to continue the change to the ISI program plan for Class 1 piping only through the use of a risk-informed inservice inspection (RI-ISI) program for the fourth 10-year interval. The risk-informed process used in this submittal is described in Westinghouse Owners Group WCAP-14572, Revision 1-NP-A, "Westinghouse Owners Group Application of Risk-Informed Methods to Piping Inservice Inspection Topical Report", (referred to as "WCAP-14572, A-version" for the remainder of this document).

5. Proposed Alternatives and Basis for Use

ASME Section XI Class 1 Categories B-F and B-J currently contain the requirements for examining (via non-destructive examination (NDE)) Class 1 piping components. This current program submittal is limited to ASME Class 1 piping, including piping currently exempt from requirements. The alternative RI-ISI program for piping is described in WCAP-14572, Revision 1-NP-A. FPL will substitute the Class 1 RI-ISI for the ASME Section XI, Category B-F and B-J examination program on piping. Other non-related portions of the ASME Section XI Code will be unaffected.

The PWSCC damage mechanism will be addressed separately from RI-ISI by FPL's augmented alloy 600 program. FPL's augmented alloy 600 inspection program implements the MRP-139 selection criteria and response to degradation identification. FPL's alloy 600 inspection program will not be subsumed into RI-ISI and the inspections will not be credited to satisfy inspections required under the ASME Section XI, 4th Interval, RI-ISI program. Weld locations currently within the scope of FPL's alloy 600 program that are mitigated by replacement of the susceptible material will be placed back into the RI-ISI program. Weld locations that are mitigated by methods other than removal of the susceptible material will continue to be examined in accordance with FPL's alloy 600 program during the 4th Interval. The 4th Interval RI-ISI program will satisfy the WCAP's selection criteria and response to flaw identification independently of FPL's alloy 600 program.

There are two deviations to the process described in WCAP-14572, A-Version:

1. WCAP-14572 uses the Westinghouse Structural Reliability and Risk Assessment Model (SRRA) to calculate failure rates. Since SRRA is a Westinghouse product

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and St. Lucie is a CE plant, FPL uses WinPRAISE, a Microsoft Windows based version of the PRAISE code used as the benchmark for SRRA in WCAP-14572 Supplement 1.

2. In WCAP-14572, selection of elements in Regions 1B and 2 of the Structural Element Selection Matrix shown in Figure 3.7-1 of the WCAP is determined by a statistical evaluation process. Since the statistical model used in the WCAP is a Westinghouse product and St. Lucie is a CE plant, an alternative selection process was used. The alternative is based on that described in EPRI Topical Report TR-112657 Rev. B-A, approved in a Safety Evaluation Report dated October 28, 1999 and on current ASME Section XI criteria. The alternative process selected 25% of the elements not within the scope of FPL's Alloy 600 Program in each High Safety Significance segment. The 4th Interval RI-ISI program satisfies the WCAP's selection criteria and response to flaw identification independently of FPL's alloy 600 program. This results in the selection of 29.7% of the total population of elements not within the scope of FPL's alloy 600 program in the High Safety Significance segments.

Basis for Use

The St. Lucie Unit 1 ISI program for the examination of Class 1 piping welds is in accordance with a risk-informed process submitted July 30, 2003. NRC approved this request on December 23, 2003 (TAC No. MC0244). In the original submittal, FPL committed to review and adjust the risk ranking of piping segments as a minimum on an ASME period basis. Most U.S. nuclear power plants have now implemented similar risk-informed inservice inspection programs, with similar review and update commitments. As a result, a task force was formed by the Nuclear Energy Institute (NEI) to formulate consistent guidance for maintaining these programs. The task force included representatives from reactor operating companies, ASME committees, EPRI, and Westinghouse. The result of this effort is document NEI 04-05, "Living Program Guidance To Maintain Risk-Informed Inservice Inspection Programs For Nuclear Plant Piping Systems", published April, 2004. While not specifically approved by the NRC, the NRC staff reviewed the document as it was being developed and provided comments.

In accordance with the guidance provided by NEI 04-05, a periodic evaluation and update was performed in conjunction with the end of the Third ISI Inspection Interval at St. Lucie Unit 1. The updated program resulting from this review is the subject of this request.

By letter dated September 12, 2005, the Materials Reliability Program (MRP) issued "Primary System Piping Butt Weld Inspection and Evaluation Guidelines (MRP-139)". Per the implementation protocol of the NEI 03-08 initiative, these guidelines are mandatory for PWR licensees. This MRP guideline identified butt weld locations susceptible to primary water stress corrosion cracking (PWSCC) and provides approaches for inspection, reinspection, mitigation, and flaw evaluation. Prior to the issuance of MRP-139, alloy 600 welds were inspected per American Society of Mechanical Engineers (ASME) Boiler and

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Pressure Vessel Code Section XI, which stated that all category B-F welds must be inspected during each 10-year interval. FPL's previously approved alternative RI-ISI program had eliminated some of the Alloy 600 weld locations from examination due to low risk and consequences. With the issuance of MRP-139, each plant was required to review all applicable alloy 82/182 welds and determine their susceptibility to PWSCC and the applicable inspection schedules for PWSCC per the requirements of MRP-139. Therefore, the PWSCC damage mechanism will be addressed separately from RI-ISI by FPL's augmented alloy 600 program.

In accordance with the guidance provided by NEI 04-05, a table is provided identifying the number of welds added to and deleted from the originally approved RI-ISI program.

Changes in weld count per Code Category between the "Third Interval Approved RI-ISI" and the "Fourth Interval RI-ISI" columns are attributable to:

- A change in definition of Category B-F in the 2001 Edition with 2003 Addenda.
- One examination location was deleted due to a configuration change: an elbow welded to a pipe was replaced with a bent pipe, eliminating the pipe-to-elbow weld.
- Because twenty four PWSCC susceptible welds are covered by FPL's alloy 600 inspection program and are not subsumed into RI-ISI, four segments were reduced to four elements in each. The alternative process of selecting 25% of the elements not within the scope of FPL's Alloy 600 Program in each High Safety Significance segment results in a reduction of 4 examination locations..

Therefore, the total number of examination locations is nineteen.

A new Change in Risk Evaluation was performed, and the risk from the revised risk-informed ISI program continues to remain constant when compared to the last deterministic Section XI inspection program.

6. Duration of Proposed Alternative

FPL will implement the alternative requirements during the fourth 10-year Inservice Inspection interval at PSL-1.

7. Precedents

St. Lucie Unit 1 submitted, by letter dated July 30, 2003, as supplemented by letters dated December 4, 2003, and January 28, 2004, relief request #19, "Risk Informed Inservice Inspection Program" for implementation during the third inspection period of the third 10-year inspection interval. The request was approved by SER dated March 25, 2004 (TAC

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No. MC0244). This request for alternative utilizes the identical methodology that was previously approved.

8. Attachments to the Request

Attachment A- "Structural Element Selection Results and Comparison to Original Program and Previous RI-ISI Program"

Attachment B- RAI Response to questions 1 through 4 received via email dated 7/31/08 10:16 AM from Brenda Mozafari, USNRC, to Ken Frehafer, St. Lucie 1 RAI Draft Questions for RI-ISI Relief Request 1 (TAC MD8041).

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Attachment A

STRUCTURAL ELEMENT SELECTION RESULTS AND COMPARISON TO ORIGINAL PROGRAM AND PREVIOUS RI-ISI PROGRAM												
System	Number of High Safety Significant Segments (No. of HSS in Aug. Program / Total No. of Segments in Aug. Program)	Degradation Mechanism(s)	Class	ASME Code Category (original 1989 Basis) ¹	Weld Count ¹		ASME XI Examination Methods ¹ (Volumetric (Vol) and Surface (Sur))		Third Interval Approved RI-ISI ^{1,2}		Fourth Interval RI-ISI ^{1,2}	
					Butt	Socket	Vol & Sur	Sur Only	SES Matrix Region	Number of Exam Locations	SES Matrix Region	Number of Exam Locations
CH	0	Thermal Fatigue	1	B-F	3	0	0	3	-	0	-	0
				B-J	13	157	0	22				
RC	11 (0/0)	Thermal Fatigue, Thermal Transients, Vibration Fatigue	1	B-F	21	0	12	9	1, 2	4 volumetric	1, 2	1 volumetric
				B-J	156	17	33	18				
SI	0	Thermal Fatigue	1	B-F	6	0	6	0	-	0	-	0
				B-J	285	15	69	22				
TOTAL	11 (0/0)		CL. 1	B-F	30	0	18	12		4 NDE		1 NDE
				B-J	454	189	102	62		20 NDE		18 NDE
			TOTAL		484	189	120	74		24 NDE ²		19 NDE ²

Summary: Original ASME Section XI selected a total of 120 non-destructive exams (surface only exams not included). The Third Interval RI-ISI program selected a total of 24 non-destructive exams, and the Fourth Interval RI-ISI program selects a total of 19 non-destructive exams.

Notes:

¹The ASME Code Category, Weld Count, ASME XI Examination Methods and Third Interval Approved RI-ISI columns are based on the 1989 Edition of the ASME Section XI Code, which was the basis for the Program when RI-ISI was originally developed (includes examination locations now covered by FPL's alloy 600 inspection program). The Fourth Interval RI-ISI column is based upon the 2001 Edition with 2003 Addenda, in which Category B-F pertains only to vessel dissimilar metal welds, and does not include Category B-F or B-J examination locations covered by FPL's alloy 600 inspection program.

²System pressure test requirements and VT-2 visual examinations shall continue to be performed in ASME Class 1 systems.

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CLASS 1 WELDS POPULATION TABLE**

Attachment B

RAI Question # 1:

Development of a risk-informed ISI (RI-ISI) program requires estimating conditional core damage and conditional large early release probabilities (CCDPs and CLERPs respectively) from the baseline PRA. Please briefly describe how the CCDPs and CLERPs that are used in the RI-ISI calculations are generated.

FPL Response:

The baseline Core Damage Frequency (CDF) of St. Lucie Unit 1 PSA model (updated in March, 2007) was used and evaluated for possible consequences of pipe rupture. For RI-ISI application, the impact of pipe breaks was simulated in the fault tree model by defining surrogate basic events whose failures are representative of the effects of the failure of their corresponding pipe segments. If a pipe break does not result in an initiating event, the appropriate surrogate event(s) was(were) set to "TRUE" prior to each fault tree quantification to simulate failure of mitigating systems or functions due to such pipe break. If a pipe break resulted in an initiating event, the appropriate surrogate event(s) was(were) set to "TRUE" and the initiating event probability set to 1.0 prior to each fault tree quantification.

Setting of surrogate events to logical TRUE/FALSE or probability value was performed through use of flag files that are developed for each pipe segment, or segments having the same effect in terms of plant response. Evaluated Pipe segment(s) in scope of this analysis was (were) grouped (in terms of postulated pipe breaks, possible consequences, and their impacts) into enumerated "cases" to be evaluated individually, and to easily identify associated scenarios and results. Each associated flag file developed for respective surrogate event(s) was pre-processed when defined as part of the quantification process. EPRI R&R Workstation software (CAFTA, PRAQUANT) and quantifier engine (FTREX) were used to quantify resulting cutsets. Reported results and associated cutsets produced by PRAQUANT/FTREX were not manipulated in any manner and produced values were further used in the calculation of CCDP and CELRP.

RAI Question # 2:

Has FPL modified or manipulated the cut-sets (or other equivalent logic model results) obtained from the baseline PRA model prior to calculating the CCDPs and CLERPs that are used to develop the RI-ISI program?

FPL Response:

Resultant cutsets produced by PRAQUANT/FTREX quantification process were not modified or manipulated in any manner prior to calculating the CCDPs and CLERPs that were used to develop the RI-ISI program.

RAI Question # 3:

If the cut-sets are modified or manipulated, please describe the technical bases for the changes and explain why the changes were judged necessary.

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CLASS 1 WELDS POPULATION TABLE**

FPL Response:

Not applicable.

RAI Question # 4:

If the cut-sets are modified or manipulated, please describe the reviews done on the technical bases for the changes, and the manipulations used to make the changes, to demonstrate that the changes are consistent with the ASME PRA standard and prior peer review results with respect to the PRA quality requirements needed to support RI-ISI.

FPL Response:

Not applicable.