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FPL

P.O. Box 128, Ft. Pierce, FL 34954-0128

July 1, 1994

L-94-169
10 CFR 50.4

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

RE: St. Lucie Units 1 and 2
Docket No. 50-335 and 50-389
Generic Letter 92-01 Revision 1
Response to Request for Additional Information

By NRC letter dated May 26, 1994, the NRC notified Florida Power and Light Company (FPL) that the NRC had completed its review of the FPL responses to NRC Generic Letter 92-01, Revision 1, L-93-286 dated November 15, 1993, and L-92-189 dated July 1, 1992. The May 26, 1994, letter requested FPL to review the enclosed pressurized thermal shock (PTS) table and upper-shelf energy (USE) table and provide comments within 30 days. Because of the Memorial Day holiday and mail delays FPL did not receive the letter until June 7, 1994. On June 17, 1994, FPL requested and was granted an extension of the response time until July 1, 1994, by the NRC Project Manager for St. Lucie.

Attachment 1 provides the schedule for the additional data requested on St. Lucie Unit 1 belt-line weld 2-203, which should be available by August 1, 1995.

In addition, the May 26, 1994, letter requested FPL to verify the summary file enclosures and provide any comments. Attachment 2 provides FPL's comments on the summary files. Tables 1 and 2 are the PTS and USE summary files for St. Lucie Unit 1. Tables 3 and 4 provide the PTS and USE summary files for St. Lucie Unit 2. Changes are identified by the shaded regions on each table and include amplifying information at the bottom of each page.

Please contact us if there are any questions about this submittal.

Very truly yours,

D. A. Sager
Vice President
St. Lucie Plant

DAS/GRM/kw

cc: Stewart D. Ebneter, Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, St. Lucie Plant

DAS/PSL #1152-94

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St. Lucie Units 1 and 2
Docket No. 50-335 and 50-389
Generic Letter 92-01 Revision 1
Response to Request for Additional Information

ATTACHMENT 1

Schedule to resolve St. Lucie Unit 1 Weld 2-203 USE

In its November 15, 1993 response to the GL 92-01 RAI (L-93-286) FPL provided an analysis by Combustion Engineering for the USE of welds 2-203 and a 1/4T USE projection at EOL. The analysis included the mean USE value with standard deviations reported for Linde 124 flux welds and a conservative maximum vessel fluence value for the EOL projection. The mean USE value was used for projections because it is the standard practice of ASTM E185 and there is no requirement to use lower bound (mean minus 2σ) USE. By Letter dated May 26, 1994, the NRC indicated that the USE value was not acceptable since it did not consider variability of other similar materials.

The Combustion Engineering Owners Group (CEOG) will be initiating a task to examine the separability of weld USE based on flux type populations. This task is scheduled for completion by mid 1995. Upon completion of this task, we will provide the USE value applicable for the St. Lucie unit 1 welds 2-203. Additionally a location specific fluence for the 2-203 welds will be provided for a more realistic 1/4T EOL USE projection. These results should be available by August 1, 1995. FPL will notify the NRC Project Manager for St. Lucie should this schedule change.

The CEOG also prepared a report, "Evaluation of Low Upper Shelf Energy For Combustion Engineering Nuclear Steam Supply Systems Reactor Pressure Vessels" (CEN-604 Rev. 1) which identified a limiting and bounding value of 38 ft-lbs for axially oriented flaws in material which continue to demonstrate the equivalent margins of safety of the ASME Code Section III Appendix G. The CEOG submitted this report to the NRC via Letter CEOG-93-479, dated September 27, 1993. This analysis bounds the St. Lucie Unit 1 reactor vessel materials including the axial welds in question.

St. Lucie Units 1 and 2
Docket No. 50-335 and 50-389
Generic Letter 92-01 Revision 1
Response to Request for Additional Information

ATTACHMENT 2

Verification of Data Summary Files

The summary files in the attached tables the St. Lucie Units 1 and 2 were retyped from the NRC enclosures. Tables 1 and 2 are the Summary File for Pressurized Thermal Shock (PTS) and USE for St. Lucie Unit 1. Tables 3 and 4 are the Summary File for PTS and USE for St. Lucie Unit 2. Changes are identified by shaded regions on each table and include amplifying information at the bottom of each page.

Table 1: St Lucie Unit 1 Summary File for Pressurized Thermal Shock

Plant Name	Beltline Ident	Heat No. Ident	ID Neut. Fluence at EOL	Initial RT_{NDT} (°F)	Method of determin. IRT_{NDT}	Chemistry Factor (CF)	Method of determin. CF	% Cu	% Ni
St. Lucie Unit 1 EOL: 3/1/2016	Int. Shell C-7-1	A-4567-1	3.372E19	0	MTEB 5-2	74.6	Table	0.11	0.64
	Int. Shell C-7-2	B-9427-1	3.372E19	-10 (Note 1)	MTEB 5-2	74.6	Table	0.11	0.64
	Int. Shell C-7-3	A-4567-2	3.372E19	+10 (Note 1)	MTEB 5-2	73.8	Table	0.11	0.58
	Lower Shell C-8-1	C-5935-1	3.372E19	20	MTEB 5-2	79.418	Calculated	0.15	0.56
	Lower Shell C-8-2	C-5935-2	3.372E19	20	Plant Specific	79.823	Calculated	0.15	0.57
	Lower Shell C-8-3	C-5935-3	3.372E19	0	MTEB 5-2	60.853	Calculated	0.12	0.58
	Int. Shell Axial Welds 2-203	A-8746 & 34B009	2.131E19	-56	Generic	91.5 (Note 3)	Table	0.19	0.10
	Lower Shell Axial Welds 3-203	305424	2.131E19	-60 (Note 2)	Sister Plant (Note 2)	191.7 (Note 3)	Table	0.28	0.63
	Int. to Lower Shell Circ Weld 9-203	90136	3.372E19	-60	Plant Specific	84.798	Calculated	0.23	0.11

Notes:

1) The values for IRT_{NDT} for plates C-7-2 and C-7-3 were correctly reported in the November 15,1993 letter (L-93-286) from D. A. Sager to USNRC, "St. Lucie Units 1 and 2 Response to Request for Additional Information, Generic Letter 92-01 Revision 1". The initial GL 92-01 response values were incorrect.

2) The actual value for IRT_{NDT} for weld 305424 determined from a sister plant was reported in the November 15, 1993 letter (L-93-286) from D. A. Sager to USNRC, "St. Lucie Units 1 and 2 Response to Request for Additional Information, Generic Letter 92-01 Revision 1". This new value was updated from the previous GL 92-01 Response.

3) These Chemistry Factor values determined from the R.G. 1.99 Rev.2 tables were inappropriately rounded up. These values were not provided by FPL.

Table 2: St. Lucie Unit 1 Summary File for Upper Shelf Energy

Plant Name	Beltline Ident	Heat No. Ident	Material Type	1/4T USE at EOL (ft-lb)	1/4T Neutron Fluence at EOL	Unirrad. USE	Method of Determin. Unirrad. USE
St. Lucie Unit 1 EOL: 3/1/2016	Int. Shell C-7-1	A-4567-1	A 533B-1	63 (Note 1)	2.01E19	82	65%
	Int. Shell C-7-2	B-9427-1	A 533B-1	63 (Note 1)	2.01E19	82	65%
	Int. Shell C-7-3	A-4567-2	A 533B-1	59 (Note 1)	2.01E19	76	65% (Note 2)
	Lower Shell C-8-1	C-5935-1	A 533B-1	59 (Note 1)	2.01E19	82	65%
	Lower Shell C-8-2	C-5935-2	A 533B-1	74 (Note 1)	2.01E19	103	Direct
	Lower Shell C-8-3	C-5935-3	A 533B-1	66 (Note 1)	2.01E19	88	65%
	Int. Shell Axial Welds 2-203	A-8746 & 34B009	Linde 124, SAW	62 (Note 3)	<2.01E19 (Note 4)	102 (Note 3)	Generic
	Lower Shell Axial Welds 3-203	305424	Linde 1092, SAW	63 (Note 5)	1.27E19	112	Sister Plant
	Int. to Lower Shell Circ Weld 9-203	90136	Linde 0091, SAW	84	2.01E19	144	Surv. Weld

Notes:

1) FPL did not provide these values. Using the USE reduction graph for plate in RG 1.99 Rev. 2, these are the 1/4T USE values at EOL. An error appears to have been made using the graph. Plate C-8-1 was reported by FPL. Its EOL 1/4 T USE value should be 59 ft-lbs.

2) No transversely oriented (weak direction) Charpy test data are known to be available. The 76 ft-lb USE was estimated using the 65% guideline in MTEB 5-2.

3) The USE for welds 2-203 was determined by a generic analysis to be 102.3 ft-lb. These values were reported in the November 15,1993 letter(L-93-286) from D. A. Sager to USNRC, "St. Lucie Units 1 and 2 Response to Request for Additional Information, Generic Letter 92-01 Revision 1". The mean value was reported since this is the practice in ASTM E185 and there is no requirement to use a lower bound value(mean minus 2σ)of USE. FPL will provide additional justification for using this value pending the completion of a CEOG task on generic USE values by 8-1-95. (See Note 4)

4) FPL provided a conservative maximum vessel fluence value for this projection in its November 15, 1993 submittal (L-93-286) using the generic mean value of USE. This value will be recalculated to a location specific fluence and submitted as part of the request for additional data.

5) FPL provided an EOL 1/4T USE value of 63 ft -lbs for welds 3-203 in its November 15, 1993 submittal (L-93-286).

Table 3: St. Lucie Unit 2 Summary File for Pressurized Thermal Shock

Plant Name	Beltline Ident.	Heat No. Ident.	ID Neut. Fluence at EOL	Initial RT_{NDT} (°F)	Method of determin. IRT_{NDT}	Chemistry Factor (CF)	Method of determin. CF	% Cu	% Ni
St. Lucie Unit 2 EOL: 4/6/2023	Lower Shell M-4116-1	B-8307-2	3.07E19	20	Plant Specific	37	Table	0.06	0.57
	Lower Shell M-4116-2	A-3131-1	3.07E19	20	Plant Specific	44	Table	0.07	0.60
	Lower Shell M-4116-3	A-3131-2	3.07E19	20	Plant Specific	44	Table	0.07	0.60
	Int. Shell M-605-1	A-8490-2	3.07E19	30	Plant Specific	74.15	Table	0.11	0.61
	Int. Shell M-605-2	B-3416-2	3.07E19	10	Plant Specific	91.5	Table	0.13	0.62
	Int. Shell M-605-3	A-8490-1 (Note 1)	3.07E19	0	Plant Specific	74.15	Table	0.11	0.61
	Int. Shell Axial Welds 101-124	83642	3.07E19	-80	Plant Specific	30.65	Table	0.04	0.07
	Int. Shell Axial Welds 101-124	83637	3.07E19	-50	Plant Specific	30.65	Table	0.04	0.07
	Lower Shell Axial Welds 101-142	83637	3.07E19	-50	Plant Specific	37.5	Table	0.05	0.10
	Int. to Lower Shell Circ Weld 101-171	83637	3.07E19	-70	Plant Specific	41.2	Table	0.07	0.08
	Int. to Lower Shell Circ Weld 101-171	3P7317	3.07E19	-80	Plant Specific	41.2	Table	0.07	0.08

Notes:

1) A typographical error was made on the heat No. for plate M-605-3 in the November 15,1993 letter(L-93-286) from D. A. Sager to USNRC, "St. Lucie Units 1 and 2 Response to Request for Additional Information, Generic Letter 92-01 Rev. 1".

Table 4: St. Lucie Unit 2 Summary File for Upper Shelf Energy

Plant Name	Beltline Ident	Heat No. Ident	Material Type	1/4T USE at EOL (ft-lb)	1/4T Neutron Fluence at EOL	Unirrad. USE	Method of Determin. Unirrad. USE
St. Lucie Unit 2 EOL: 3/1/2023	Lower Shell M-4116-1	B-8307-2	A 533B-1	71	1.83E19	91	Direct
	Lower Shell M-4116-2	A-3131-1	A 533B-1	82	1.83E19	105	Direct
	Lower Shell M-4116-3	A-3131-2	A 533B-1	78	1.83E19	100	Direct
	Int. Shell M-605-1	A-8490-2	A 533B-1	81	1.83E19	105	Direct
	Int. Shell M-605-2	B-3416-2	A 533B-1	85 (Note 2)	1.83E19	113	Direct
	Int. Shell M-605-3	A-8490-1 (Note 1)	A 533B-1	87 (Note 2)	1.83E19	113	Direct
	Int. Shell Axial Welds 101-124	83642	Linde 0091, SAW	90	1.83E19	116	Direct
	Int. Shell Axial Welds 101-124	83637	Linde 0091, SAW	106	1.83E19	136	Direct
	Lower Shell Axial Welds 101-142	83637	Linde 0091, SAW	106	1.83E19	136	Direct
	Int. to Lower Shell Circ Weld 101-171	83637	Linde 124, SAW	88	1.83E19	115	Direct
	Int. to Lower Shell Circ Weld 101-171	3P7317	Linde 124, SAW	73 (Note 3)	1.83E19	96	Direct

Notes:

1) A typographical error was made on the heat No. for plate M-605-3 in the November 15,1993 letter(L-93-286) from D. A. Sager to USNRC, "St. Lucie Units 1 and 2 Response to Request for Additional Information, Generic Letter 92-01 Revision 1".

2) FPL did not provide these projections. Using the USE reduction graph for plate material in RG 1.99 Rev. 2,these are the 1/4T USE values at EOL. It appears that the USE reductions were calculated using the weld material graph. Reduction factors of 25% and 23% were used for plates M-605-2 and M-605-3 respectively.

3) The USE Reduction value was improperly reported in the November 15,1993 letter (L-93-286) from D. A. Sager to USNRC, "St. Lucie Units 1 and 2 Response to Request for Additional Information, Generic Letter 92-01 Revision 1". The correct value should be 24% from R.G. 1.99 Revision 2.