

CATEGORY 1

REGULATOR INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9610160155 DOC. DATE: 96/10/10 NOTARIZED: NO DOCKET #
FACIL: 50-335 St. Lucie Plant, Unit 1, Florida Power & Light Co. 05000335
AUTH. NAME AUTHOR AFFILIATION
STALL, J.A. Florida Power & Light Co.
RECIP. NAME RECIPIENT AFFILIATION
Document Control Branch (Document Control Desk)

SUBJECT: Forwards summary & results of reactor pressure vessel weld exam results.

DISTRIBUTION CODE: A047D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 4
TITLE: OR Submittal: Inservice/Testing/Relief From ASME Code - GL-89-04

NOTES:

	RECIPIENT		COPIES			RECIPIENT		COPIES	
	ID CODE/NAME		LTR	ENCL		ID CODE/NAME		LTR	ENCL
	PD2-3 LA		1	1		PD2-3 PD		1	1
	WIENS, L.		1	1					
INTERNAL:	ACRS		1	1		AEOD/SPD/RAB		1	1
	<u>FILE CENTER</u> 001		1	1		NRR/DE/EMEB		1	1
	NUDOCS-ABSTRACT		1	1		OGC/HDS3		1	0
	RES/DET/EMMEB		1	1		RES/DSIR/EIB		1	1
EXTERNAL:	LITCO ANDERSON		1	1		NOAC		1	1
	NRC PDR		1	1					

NOTE TO ALL "RIDS" RECIPIENTS:
PLEASE HELP US TO REDUCE WASTE. TO HAVE YOUR NAME OR ORGANIZATION REMOVED FROM DISTRIBUTION LISTS OR REDUCE THE NUMBER OF COPIES RECEIVED BY YOU OR YOUR ORGANIZATION, CONTACT THE DOCUMENT CONTROL DESK (DCD) ON EXTENSION 415-2083

TOTAL NUMBER OF COPIES REQUIRED: LTR 14 ENCL 13

C
A
T
E
G
O
R
Y

1

D
O
C
U
M
E
N
T



October 10, 1996

L-96-250
10 CFR 50.55a
10 CFR 50.36

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

Re: St. Lucie Unit 1
Docket No. 50-335
In-Service-Inspection Plan
Second Ten-Year Interval
Reactor Pressure Vessel Weld Examination Results

On October 13 1995, NRC approved the Florida Power Light Company (FPL) request for authorization of an alternative reactor pressure vessel (RPV) examination for St. Lucie Unit 1. The FPL request was submitted by FPL letter, L-95-123 dated April 27, 1995. As part of the review and approval process, FPL committed to use newer inspection techniques, as available, that would provide a substantial increase in the coverage of areas missed with techniques used during the last RPV examination. In addition, the NRC approval requested FPL to notify the NRC in writing of the actual examination coverage obtained. A summary of the examination and the requested RPV examination coverage results are attached.

Should there be any questions, please contact us.

Very truly yours,

J. A. Stall
Vice President
St. Lucie Plant

JAS:GRM

Attachment

160042

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

1/1
A047

9610160155 961010
PDR ADOCK 05000335
G PDR

St. Lucie Unit 1
Docket No. 50-335
L-96-250 Attachment

Reactor Pressure Vessel Weld Examination Results

Alternative Examinations Proposed

1. Periodic system pressure tests per Category B-P, Table IWB 2500-1 have been performed.
2. Essentially 100% mechanized (automated) ultrasonic examinations have been conducted to the extent practical on all reactor pressure vessel welds from the inside surface.
3. A 50/70 bi-modal ultrasonic examination was conducted of the inner 25% vessel wall and the cladding-base metal interface.
4. Full-vee 45 degree shear wave examination was not performed because it was determined to be an inferior examination technique. This technique has been shown to be effective only for large flaws. The newly devised techniques described below proved to be much more effective in terms of examination quality for the detection and sizing of smaller flaws.
5. Special qualified single-side access examination techniques were selected to enhance coverage and quality over the 1983 methodology.

Special Examination Techniques Employed

Examination techniques designed to meet the requirements of ASME Section XI, Appendix VIII were used during the 1996 examination. The vessel shell weld examination technique featured 45 and 55 degree "duplex" transducers which exhibit superior flaw detection capability. "Duplex" transducers demonstrated significant improvement of signal-to-noise ratios over previous designs which allow flaw discrimination at higher examination sensitivity.

The inner 25% of the vessel wall was examined using 50/70 degree bi-modal transducers designed to enhance the ability to detect "under-clad" flaws. These techniques represent state-of-the-art examination technology with the ability to provide increased weld coverage to effectively detect flaws from a single direction.

Both techniques were qualified, for single side and two sided access, by demonstration in accordance with the rules of Appendix VIII as implemented by the Performance Demonstration Initiative (PDI). The demonstration met the rules of ASME Section XI, IWA-2240 and was witnessed by representatives of both authorized nuclear In-Service-Inspection agencies.

St. Lucie Unit 1
Docket No. 50-335
L-96-250 Attachment

Flaw discrimination methods, independent of amplitude, eliminated the time consuming need for maintaining extremely tight signal amplitude controls on calibration and scanning gain settings. This, together with the digital electronic calibration parameter storage capabilities of the advanced ultrasonic imaging system, provided a more efficient, yet qualified, examination process.

Alternative Examination Coverage Results

Table 1 compares the 1996 coverage with the coverage achieved in the previous examination. Although limitations were overcome or reduced in several cases, three welds (10-203, 1-203A and 1-203B) actually show an apparent reduction in coverage. This is a result of differences in the calculation methods. In 1983, FPL included the perceived "extended reach" of the full-vee path 45 degree ultrasonic beam. Current thinking dismisses the effectiveness of broadly divergent ultrasonic beams at such long beam paths. The 1996 calculations represent more realistic values.

Remaining Limitations

The limitations noted in Table 1 are fixed geometric obstructions caused by permanent welded attachments on the interior of the vessel. The outside of the vessel is inaccessible, as previously reported. Further reduction of the limitations noted was not practical.

Detectable Indications in RPV Shell Welds (1996 results)

All indications detected during this examination were acceptable in accordance with ASME Section XI without analytical evaluation. In addition, no new indications were found.

St. Lucie Unit 1
Docket No. 50-335
L-96-250 Attachment

Table 1
Results of St. Lucie 1 Augmented Reactor Pressure Vessel Examination

Weld	Item No.	Description	1983 Percent Coverage	1996 Percent Coverage	Limitation
10-203	B1.11	Lower Shell to Lower Head Circumferential	86.8%	80.5%	Core support and anti-rotation lugs
9-203	B1.11	Intermediate Shell to Lower Shell	83.5%	83.5%	Materials surveillance capsules
8-203	B1.11	Upper Shell to Intermediate Shell	100%	100%	none
3-203A	B1.12	Lower Shell Longitudinal at 135 degrees	95%	100%	none
3-203B	B1.12	Lower Shell Longitudinal at 255 degrees	94.2%	100%	none
3-203C	B1.12	Lower Shell Longitudinal at 15 degrees	95%	100%	none
2-203A	B1.12	Intermediate Shell Longitudinal at 15 degrees	91.6%	100%	none
2-203B	B1.12	Intermediate Shell Longitudinal at 135 degrees	91.6%	100%	none
2-203C	B1.12	Intermediate Shell Longitudinal at 255 degrees	90.2%	100%	none
1-203A	B1.12	Upper Shell Longitudinal at 255 degrees	91.6%	91.0%	Adjacent flange taper geometry
1-203B	B1.12	Upper Shell Longitudinal at 15 degrees	78.8%	54.0%	Adjacent outlet nozzle integral extension and flange taper geometry
1-203C	B1.12	Upper Shell Longitudinal at 135 degrees	88.3%	91.0%	Adjacent flange taper geometry