Progress Energy

Crystal River Nuclear Plant
Docket No. 50-302
Operating License No. DPR-72

Ref: 10 CFR 50.55a

March 26, 2008
3F0308-07

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: Crystal River Unit 3 – Relief Request #08-001-RR, Revision 1: Reports of Weld Overlay Examination Results

Reference: Crystal River Unit 3 to NRC letter, 3F0308-04, dated March 12, 2008, "Crystal River Unit 3 – Relief Request #08-001-RR, Revision 1"

Dear Sir:

As committed to in the referenced document, Florida Power Corporation (FPC), doing business as Progress Energy Florida, Inc., is hereby submitting reports of weld overlay examination results for the structural weld overlay that was applied to the Decay Heat (DH) drop line at Crystal River Unit 3 (CR3) during the March 2008 outage.

Engineering acceptance of the Ultrasonic Examination results for the DH drop line weld overlay occurred on March 19, 2008. This submittal is being made within fourteen days of CR3 Engineering acceptance of the results and fulfills three regulatory commitments made in the referenced document.

This submittal contains no new regulatory commitments.

If you have any questions regarding this submittal, please contact Dennis Herrin, Acting Supervisor, Licensing and Regulatory Programs at (352) 563-4633.

Sincerely,

Stephen J. Cahill
Engineering Manager

Berry J. Foster/acting

SJC/dar

Attachments: 1. Relief Request #08-001-RR, Revision 1: Reports of Weld Overlay Examination Results
2. Phased Array Ultrasonic Examination and Calibration Records (Five Pages)

xc: NRR Project Manager
Regional Administrator, Region II
Senior Resident Inspector

Progress Energy Florida, Inc.
Crystal River Nuclear Plant
15760 W. Powerline Street
Crystal River, FL 34428

A047
NRR

PROGRESS ENERGY FLORIDA, INC.

CRYSTAL RIVER UNIT 3

DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72

RELIEF REQUEST #08-001-RR, REVISION 1: REPORTS OF WELD OVERLAY EXAMINATION RESULTS

Attachment 1

Relief Request #08-001-RR, Revision 1: Reports of Weld Overlay Examination Results

Relief Request #08-001-RR, Revision 1: Completed Commitments

Relief Request #08-001-RR, Revision 1, was submitted to the Nuclear Regulatory Commission (NRC) to support the application of a structural weld overlay to the Decay Heat (DH) drop line at Crystal River Unit 3 (CR3). During a maintenance outage that commenced on March 1, 2008, an indication of Primary Water Stress Corrosion Cracking (PWSCC) was detected on the DH nozzle Alloy 82/182 weld. PWSCC has been identified as a degradation mechanism for Alloy 82/182 welds and weld buttering. To ensure the integrity of the reactor coolant pressure boundary, Florida Power Corporation (FPC) concluded that the application of a full-structural weld overlay over this weld was the most appropriate course of action. However, ASME Code Section XI, 1989 Edition, no Addenda, provides no rules for the design of weld overlays or for repairs without removal of flaws. Additionally, Code Case N-504-3, "Alternate Rules for Repair of Classes 1, 2, and 3 Austenitic Stainless Steel Piping," which has been approved by the NRC for use, does not provide the methodology for overlaying nickel alloy welds joining austenitic and ferritic base materials. Therefore, FPC proposed this weld overlay as an alternate repair in the referenced document. Verbal approval from the NRC of this alternate repair was provided in a phone call on March 13, 2008.

As part of Relief Request #08-001-RR, four regulatory commitments were made. FPC committed to providing a response to three of these regulatory commitments within fourteen days after CR3 Engineering accepted the Ultrasonic Examination results of the DH drop line weld overlays. Since Engineering accepted these results on March 19, 2008, the response to these regulatory commitments is due by April 2, 2008. These are provided below.

FPC committed to providing a response to the fourth regulatory commitment within sixty days after entry into Mode 4 start-up following the March 2008 maintenance outage. Since entry into Mode 4 start-up occurred on March 19, 2008, the response to this regulatory commitment will be provided by May 18, 2008, in a separate letter.

Commitment 1

Provide a report of the weld overlay examination results including a listing of indications detected. The recording criteria of the ultrasonic examination procedure to be used for the examination of the overlays requires that all indications, regardless of amplitude, be investigated to the extent necessary to provide accurate characterization, identity, and location. Additionally, the procedure requires that all indications, regardless of amplitude, that cannot be clearly attributed to the geometry of the overlay configuration be considered flaw indications.

Response 1

During the examinations, no suspected flaw indications such as lack of bond, weld flaws, planar flaws, or laminar flaws, were observed. The Pre-Service Inspection examination covered 99% of the Code Required Volume in the circumferential direction and 100% in the axial direction. The Inservice Inspection examinations covered 100% of the Code Required Volume in both the circumferential and axial directions.

Please refer to the Phased Array Ultrasonic Examination Record in Attachment 2.

Commitment 2

Provide a report documenting the disposition of indications using the standards of ASME Section XI, IWB-3514-2 and/or IWB-3514-3 criteria and, if possible, the type and nature of the indications. The ultrasonic examination procedure requires that all suspected flaw indications are to be plotted on a cross-sectional drawing of the weld and that the plots should accurately identify the specific origin of the reflector.

Response 2

There were no suspected flaw indications observed during the examinations. No disposition was necessary.

Commitment 3

Provide a report discussing any repairs to the weld overlay material and/or base metal and the reason for the repairs.

Response 3

There were no repairs necessary to the weld overlay material or base metal.

PROGRESS ENERGY FLORIDA, INC.

CRYSTAL RIVER UNIT 3

DOCKET NUMBER 50 - 302 / LICENSE NUMBER DPR - 72

RELIEF REQUEST #08-001-RR, REVISION 1: REPORTS OF WELD OVERLAY EXAMINATION RESULTS

Attachment 2

Phased Array Ultrasonic Examination and Calibration Records (Five Pages)

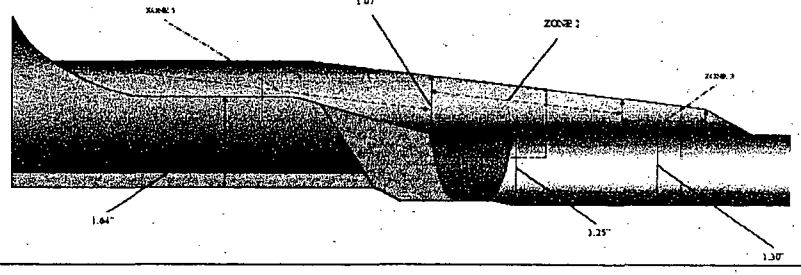
Structural Integrity Associates, Inc.

PHASED ARRAY ULTRASONIC EXAMINATION RECORD

Examination Data Sheet No.: CR3- HL DECAY HEAT-WOL-08-01
Calibration Data Sheet No.: See Comments Section
Date: 03/18/08 **Time:** 0830 through 1201

Plant: Crystal River	**Unit:** 3	**Procedure No.:** SI-UT-126	**Revision:** 3	**Examination Scans Performed**	Yes	No
Component: ~~Pressurizer Vessel~~ Hot Leg Decay Heat Nozzle Weld Overlay				(1) Axial (Facing Downstream)	☒	☐
Component Configuration: OM 3/26/08 Weld Overlay		**Weld Overlay No.:** CR3 ISI Summary Number B4.1.27		(2) Axial (Facing Upstream)	☒	☐
Weld Overlay Regions:	Nozzle/DMW/Pipe			(3) Circumferential (Clockwise Flow[1])	☒	☐
Weld Overlay Thickness:	Nominal 0.76 Inch	**Examination Angles**		(4) Circumferential (Counterclockwise [1])	☒	☐
Examination Surface:	Surface of Weld Overlay	Axial 0° through 83° [2] ☒	Circumferential 0° through 69° [2] ☒	Notes: [1] As Viewed Facing Downstream [2] Examination angles are generated in 1° increments.		
	Examination Sensitivity:	44.0 dB	39.0 dB			

Comments:
No suspected flaw indications, such as lack of bond, weld flaws, planar flaws, or laminar flaws, were observed during the examinations. The examination gain was adjusted to maintain the procedure-specified baseline noise level from 5% to 20% of full screen height. The lower range of examination angles detected responses from the inside surface of the component which were useful for monitoring search unit contact / coupling effectiveness during the examination.
PSI exam with 99% (CRV)in the Circ direction / 100% in the ax direction, ISI exams with 100% (CRV) in the CIRC and AX directions. (Code Required Volume).



The applicable Calibration Data Sheets are listed below:
CR3-08-DH-AX, CR3-08-DH-WBM-CIRC, CR3-08-DH-Z1Z2-CIRC & CR3-08-DH-Z3-CIRC

Examiner: Robert E. Bailey Jr. **Level:** II **Date:** 03/18/08
Examiner: Mike W. K. Compton **Level:** II **Date:** 03/18/08
Reviewer: John J. Hayden **Level:** III **Date:** 03/19/08

PGN NDE LEVEL III REVIEW: Damon Priestley 3/19/2008

Structural Integrity Associates

ULTRASONIC PHASED ARRAY CALIBRATION RECORD

Customer: Progress Energy	**Calibration File Name:** CR3-08-DH-AX
Plant/Unit: Crystal River - Unit 3	**Procedure No:** SI-UT-126, Rev.3
Component/System: Hot Leg Decay Heat Nozzle Weld Overlay	

Wedge

Manufacturer:	SI
Model:	8.1" Radius WOL
Material:	Rexolite
Velocity:	0.228 X 10^6 in/sec
Wedge Angle:	16°
Scan Direction:	Axial
WOL Nominal OD:	15.20"

Refracted Angle Verification

Focal Law Angle	Measured Angle	Index Offset
60°	62°	0.45"
45°	45°	0.50"
30°	29°	0.65"

Instrument

Manufacturer:	R/D Tech / Olympus
Model:	OmniScan MX
Serial Number:	OMNI-6171
Phased Array Module:	OMNI-M-PA32 / 128PR
PA Module Serial No.:	OMNI-1983
Software Revision:	1.4R3
Instrument Settings:	Electronic Record

Search Unit Integral Cable

Type:	32 conductor, 38 gauge coaxial
Length:	8'
Connectors:	Hypertronics

Intermediate Cable

Type:	32 conductor, 38 gauge coaxial
Length:	18"
Connectors:	Hypertronics / OmniScan

Search Unit

Manufacturer:	GE	**Element Length:**	2.70 mm
Transmit Model:	115-000-404	**Element Width:**	1.20 mm
Transmit Serial Number:	01ML7V	**Elements (Primary Axis):**	16
Receive Model:	115-000-405	**Elements (Secondary Axis):**	2
Receive Serial Number:	01MLLN	**Inactive Element- Transmit:**	0
Frequency (MHz):	2.0	**Inactive Element – Receive:**	0

Calibration Data Files

Focal Law: CR3 08 DH AX.Law

Angles Generated: 0° through 83° (1° Increments)

Set-up File: CR3-08-DH-AX-36.ops

Couplant / Batch Ultragel II / 02220

Wave Mode: Longitudinal

Focal Sound Path: 36mm

Calibration Block(s): SI-13-AX-03

Calibration Reflector Data

Calibration Reflector	Reference Angle	% FSH	Ref. Gain	Wedge Delay
0.40" Deep SDH	WOL 70°	81	46.2 dB	0.10 µsec
0.50" Deep SDH	WOL 70°	83	44.7 dB	0.00 µsec
0.70" Deep SDH	WOL 60°	84	49.2 dB	0.53 µsec
1.00" Deep SDH	WOL 60°	84	46.7 dB	1.00 µsec
0.10" Deep SDH	WOL 80°	80	44.7 dB	1.52 µsec
1.20" Deep SDH	WOL 45°	81	44.2 dB	1.02 µsec
0.80" Deep SDH	WOL 0°	83	39.2 dB	0.00 µsec

Comments:

Applies for the axial examination of the Weld Overlay Material and the Weld and Base Material of the Dissimilar Metal Nozzle-to-Safe End weld.

Calibration Performed	Examiner		Level	Date - Time
Initial:	Michael Kleinjan	Michael W Kleinjan	II	03/17/2008 @ 1439
Final:	Michael Kleinjan	Michael W Kleinjan	II	03/18/2008 @ 1309
Reviewed:	John J Hayden		III	03/19/08

PGN NDE LEVEL III REVIEW: DAMON PRIESTLEY 3/19/2008

Structural Integrity Associates

ULTRASONIC PHASED ARRAY CALIBRATION RECORD

Customer: Progress Energy	**Calibration File Name:** CR3-08-DH-WBM-CIRC
Plant/Unit: Crystal River - Unit 3	**Procedure No:** SI-UT-126, Rev.3
Component/System: Hot Leg Decay Heat Nozzle Weld Overlay	

Wedge

Manufacturer:	SI
Model:	8.1" Radius WOL
Material:	Rexolite
Velocity:	0.228 X 10^6 in/sec
Wedge Angle:	16°
Scan Direction:	Circumferential
WOL Nominal OD:	15.20"

Refracted Angle Verification

Focal Law Angle	Measured Angle	Index Offset
60°	60°	0.60"
45°	45°	0.65"
30°	31°	0.70"

Instrument

Manufacturer:	R/D Tech / Olympus
Model:	OmniScan MX
Serial Number:	OMNI-6171
Phased Array Module:	OMNI-M-PA32 / 128PR
PA Module Serial No.:	OMNI-1983
Software Revision:	1.4R3
Instrument Settings:	Electronic Record

Search Unit Integral Cable

Type:	32 conductor, 38 gauge coaxial
Length:	8'
Connectors:	Hypertronics

Intermediate Cable

Type:	32 conductor, 38 gauge coaxial
Length:	18"
Connectors:	Hypertronics / OmniScan

Search Unit

Manufacturer:	GE	**Element Length:**	2.70 mm
Transmit Model:	115-000-404	**Element Width:**	1.20 mm
Transmit Serial Number:	01ML7v	**Elements (Primary Axis):**	16
Receive Model:	115-000-405	**Elements (Secondary Axis):**	2
Receive Serial Number:	01MLLn	**Inactive Element- Transmit:**	0
Frequency (MHz):	2.0	**Inactive Element – Receive:**	0

Calibration Data Files

Focal Law: DH Circ DMW.Law

Angles Generated: 0° through 69° (1° Increments)

Set-up File: CR3-08-DH-DMW-CIRC-50.ops

Couplant / Batch Ultragel II / 02220

Wave Mode: Longitudinal

Focal Sound Path: 50mm

Calibration Block(s): SI-13-CIRC-03

Calibration Reflector Data

Calibration Reflector	Reference Angle	% FSH	Ref. Gain	Wedge Delay
1.00" Deep SDH	WOL 44°	83.0	40.0dB	1.40 µsec

Comments:

Applies for the circumferential examination of the Weld Overlay and the Weld and Base Material of the DMW Nozzle to Pipe weld

Calibration Performed	Examiner		Level	Date - Time
Initial:	Michael Kleinjan	Mike w Kleinjan	II	03/17/2008 @ 1544
Final:	Michael Kleinjan	Mike w Kleinjan	II	03/18/2008 @ 1321
Reviewed:	John J Hayden		III	03/19/08

PGN NDE LEVEL III REVIEW: Damon Priestley 3/19/2008

Structural Integrity Associates

ULTRASONIC PHASED ARRAY CALIBRATION RECORD

Customer: Progress Energy	**Calibration File Name:** CR3-08-DH-Z1Z2-CIRC
Plant/Unit: Crystal River - Unit 3	**Procedure No:** SI-UT-126, Rev.3
Component/System: Hot Leg Decay Heat Nozzle Weld Overlay	

Wedge

Manufacturer:	SI
Model:	8.1" Radius WOL
Material:	Rexolite
Velocity:	0.228 X 10^6 in/sec
Wedge Angle:	16°
Scan Direction:	Circumferential
WOL Nominal OD:	15.20"

Refracted Angle Verification

Focal Law Angle	Measured Angle	Index Offset
60°	60°	0.65"
45°	45°	0.60"
30°	31°	0.55"

Instrument

Manufacturer:	R/D Tech / Olympus
Model:	OmniScan MX
Serial Number:	OMNI-6171
Phased Array Module:	OMNI-M-PA32 / 128PR
PA Module Serial No.:	OMNI-1983
Software Revision:	1.4R3
Instrument Settings:	Electronic Record

Search Unit Integral Cable

Type:	32 conductor, 38 gauge coaxial
Length:	8'
Connectors:	Hypertronics

Intermediate Cable

Type:	32 conductor, 38 gauge coaxial
Length:	18"
Connectors:	Hypertronics / OmniScan

Search Unit

Manufacturer:	GE	**Element Length:**	2.70 mm
Transmit Model:	115-000-404	**Element Width:**	1.20 mm
Transmit Serial Number:	01ML7V	**Elements (Primary Axis):**	16
Receive Model:	115-000-405	**Elements (Secondary Axis):**	2
Receive Serial Number:	01MLLN	**Inactive Element- Transmit:**	0
Frequency (MHz):	2.0	**Inactive Element – Receive:**	0

Calibration Data Files

Focal Law: DH CIRC Z1Z2.Law

Angles Generated: 0° through 69° (1° Increments)

Set-up File: CR3-08-DH-Z1Z2-CIRC-31.ops

Couplant / Batch Ultragel II / 02220

Wave Mode: Longitudinal

Focal Sound Path: 31mm

Calibration Block(s): SI-13-CIRC-03

Calibration Reflector Data

Calibration Reflector	Reference Angle	% FSH	Ref. Gain	Wedge Delay
0.40" Deep SDH	WOL 53°	82	36.1dB	1.90 µsec
0.70" Deep SDH	WOL 50°	81	39.2dB	1.61 µsec

Comments:

Applies for the circumferential examination of the Weld Overlay.

Calibration Performed	Examiner		Level	Date - Time
Initial:	Michael Kleinjan	Mike W Kleinjan	II	03/17/2008 @ 1501
Final:	Michael Kleinjan	Mike W Kleinjan	II	03/18/2008@ 1333
Reviewed:	John J Hayden		III	03/19/08

PGN NDE LEVEL III REVIEW : DAMON PRIESTLEY 3/19/2008

Structural Integrity Associates

ULTRASONIC PHASED ARRAY CALIBRATION RECORD

Customer: Progress Energy	**Calibration File Name:** CR3-08-DH-Z3-CIRC
Plant/Unit: Crystal River - Unit 3	**Procedure No:** SI-UT-126, Rev.3
Component/System: Hot Leg Decay Heat Nozzle Weld Overlay	

Wedge

Manufacturer:	SI
Model:	8.1" Radius WOL
Material:	Rexolite
Velocity:	0.228 X 10^6 in/sec
Wedge Angle:	16°
Scan Direction:	Circumferential
WOL Nominal OD:	15.20"

Refracted Angle Verification

Focal Law Angle	Measured Angle	Index Offset
60°	60°	0.60"
45°	45°	0.65"
30°	31°	~~0.70"~~ 0.70

MK MAR-19-08

AP 3/19/08

Instrument

Manufacturer:	R/D Tech / Olympus
Model:	OmniScan MX
Serial Number:	OMNI-6171
Phased Array Module:	OMNI-M-PA32 / 128PR
PA Module Serial No.:	OMNI-1983
Software Revision:	1.4R3
Instrument Settings:	Electronic Record

Search Unit Integral Cable

Type:	32 conductor, 38 gauge coaxial
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Connectors:	Hypertronics

Intermediate Cable

Type:	32 conductor, 38 gauge coaxial
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Search Unit

Manufacturer:	GE	**Element Length:**	2.70 mm
Transmit Model:	115-000-404	**Element Width:**	1.20 mm
Transmit Serial Number:	01ML7V	**Elements (Primary Axis):**	16
Receive Model:	115-000-405	**Elements (Secondary Axis):**	2
Receive Serial Number:	01MLLN	**Inactive Element- Transmit:**	0
Frequency (MHz):	2.0	**Inactive Element – Receive:**	0

Calibration Data Files

Focal Law: DH CIRC Z3.LAW

Angles Generated: 0° through 69° (1° Increments)

Set-up File: CR3-08-DH-Z3-CIRC.ops

Couplant / Batch Ultragel II / 02220

Wave Mode: Longitudinal

Focal Sound Path: 20mm

Calibration Block(s): SI-13-CIRC-03

Calibration Reflector Data

Calibration Reflector	Reference Angle	% FSH	Ref. Gain	Wedge Delay
0.50" Deep SDH	WOL 52°	80	37.0dB	2.00 µsec
1.00" Deep SDH	WOL 48°	82	42.9dB	0.30 µsec

Comments:

Applies for the circumferential examination of the Weld Overlay material.

Calibration Performed	Examiner		Level	Date - Time
Initial:	Michael Klienjan	Mike w Klienjan	II	03/17/2008 @ 1531
Final:	Michael Klienjan	Mike w Klienjan	II	03/18/2008 @ 1345
Reviewed:	John J Hayden		III	03/19/08

PGN NDE LEVEL III REVIEW : DAMON PRIESTLEY 3/19/2008