Duke Energy®

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January 11, 2012

10 CFR 50.55a

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

Subject: Duke Energy Carolinas, LLC (Duke Energy)
McGuire Nuclear Station, Unit 2
Docket No. 50-370
Relief Request Serial # 12-MN-002
Limited Weld Examinations during Refueling Outage 2EOC20

Pursuant to 10 CFR 50.55a(g)(5)(iii), Duke Energy hereby requests NRC approval of relief for the weld listed in Table 1 of the proposed relief request. This weld was required to be examined in accordance with Inservice Inspection Plan for McGuire Unit 2, Third 10-Year Inservice Inspection Interval. The details of the request are included in the enclosure.

This submittal contains no regulatory commitments.

If you have any questions or require additional information, please contact P.T. Vu at (980) 875-4302.

Sincerely,

Regis T. Repko

Enclosure

A047
NRR

xc:

V. M. McCree, Region II Administrator
U. S. Nuclear Regulatory Commission
Marquis One Tower
245 Peachtree Center Ave., NE Suite 1200
Atlanta, GA 30303-1257

J. H. Thompson, Project Manager
U. S. Nuclear Regulatory Commission
11555 Rockville Pike
Mail Stop O-8G9A
Rockville, MD 20852-2738

J. Zeiler
NRC Senior Resident Inspector
McGuire Nuclear Station

ENCLOSURE

Relief Request 12-MN-002

1.0 Scope of Relief Request

Relief is requested pursuant to 10 CFR 50.55a(g)(5)(iii) for the weld listed in Table 1. This weld was required to be examined in accordance with Inservice Inspection (ISI) Plan for the following Unit:

McGuire Nuclear Station – Unit 2
Third 10-Year ISI Interval
Interval Start Date: 03/01/2004

Table 1

Relief Request Section Number	McGuire Unit Number	Examination Performed (Refueling Outage)	Weld ID Number	Item/Summary Number	Examination Data
2.0	2	2EOC20	2NV2FW216-60	M2.R1.11.0276	See Attachment A Pages 1-6

2.0 Weld #2NV2FW216-60

2.1 ASME Code Component(s) Affected

Unit 2, Pipe to Pipe Weld #2NV2FW216-60, Summary Number M2.R1.11.0276.

2.2 Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI, 1998 Edition through the 2000 Addenda.

2.3 Applicable Code/Licensing Requirement

WCAP-14572, Rev. 1-NP-A, Supplement 2, Table 4.1-1, Examination Category R-A, Item Number R1.11, Figure IWB-2500-8(c), 100% Volume Coverage of Examination Volume C-D-E-F.

The NRC authorized the inclusion of the Risk Informed ISI program as an acceptable alternative to the ASME Code, Section XI requirements for ASME Code Class 1 piping welds, Examination Categories B-F and B-J and ASME Code Class 2 piping welds, Examination Categories C-F-1 and C-F-2 for the third ISI interval by letter dated 06/12/2002.

2.4 Impracticality of Compliance

Surface 1: Stainless Steel Pipe
Surface 2: Stainless Steel Pipe
Nominal Pipe Size: 2.0 inch
Thickness: 0.344 inch

The limitations were due to proximity of a permanent welded pipe support that did not allow complete scanning from the pipe side (Scan 2). Scanning requirements are described in 10 CFR 50.55a(b)(2)(xv)(A)(1). The aggregate coverage was calculated as follows:

- 70° shear waves obtained 76.5% coverage in one axial direction (Scan 1- pipe).
- 70° shear waves obtained 53.0% coverage in one axial direction (Scan 2 – pipe).
- 45° shear and longitudinal waves obtained 76.5% coverage in one circumferential direction (Scan 3 – clockwise).
- 45° shear and longitudinal waves obtained 76.5% coverage in one circumferential direction (Scan 4 – counterclockwise).
- The aggregate coverage was calculated to be (76.5% + 53.0% + 76.5% + 76.5%)/4 = 70.625%.

In order to scan all of the required volume for this weld, the permanent welded pipe support would have to be redesigned to allow scanning from both sides of the weld, which is impractical. The McGuire ISI Plan allows the use of Code Case N-460, which required greater than 90% volumetric coverage of examination volume C-D-E-F. Therefore, the available coverage will not meet the acceptance criteria of this Code Case.

2.5 Proposed Alternative and Basis for Use

No alternative examinations are planned for the weld during the current inspection interval. Radiography (RT) is not a desired option because RT is limited in the ability to detect expected degradation mechanisms such as thermal fatigue cracking and stress corrosion crack initiating at the pipe inside surface. Additionally, RT has not been qualified through performance demonstrations.

2.6 Duration of Proposed Alternative

This request is for the duration of the third ISI interval, currently scheduled to end on 07/15/2014.

2.7 Justification for Granting Relief

Ultrasonic examination of the weld for the Item Number M2.R1.11.0276 was conducted using personnel, equipment and procedures qualified in accordance with ASME Section XI, 1998 Edition with the 2000 Addenda.

The system leakage test performed each inspection period in accordance with Table IWC-2500-1, Examination category C-H requires a VT-2 visual examination to detect evidence of leakage. This test and VT-2 examination provide additional assurance of pressure boundary integrity.

In addition to the above Code required examinations (volumetric and pressure test), Reactor Building Normal Sump monitoring provides additional assurance that, in the event that leakage did occur through this weld, it would be detected and proper action taken.

Duke Energy has examined the weld/component to the maximum extent possible utilizing approved examination techniques and equipment. Based on the acceptable results for the coverage completed by the volumetric examination, the pressure testing (VT-2) examinations required by Section XI, and the leakage monitoring, it is Duke Energy's position that the combination of examinations provides a reasonable assurance of quality and safety.

Duke Energy.

UT Calibration / amination

Site/Unit:	McGuire / 2	Procedure:	PDI-UT-2	Outage No.:	M2-20
Summary No.:	M2.R1.11.0276	Procedure Rev.:	E	Report No.:	UT-11-159
Workscope:	ISI	Work Order No.:	01929201	Page:	1 of 6

Code:	1998/2000 Addenda	Cat./Item:	R-A/R1.11	Location:	Rx Bldg.
Drawing No.:	MCFI-2NV216	Description:	Pipe To Pipe		
System ID:	NV				
Component ID:	2NV2FW216-60	Size/Length:	N/A	Thickness/Diameter:	0.344/2.0/SS
Limitations:	Yes - See attached sheets (welded pipe support)	Start Time:	1613	Finish Time:	1642

Instrument Settings

Serial No.:	011MBT		
Manufacturer:	KRAUTKRAMER		
Model:	USN-60		
Delay:	6.2497	Range:	1.0
M'll Cal/Vel:	.123	Pulser:	High
Damping:	1K	Reject:	0%
Rep. Rate:	Autohigh	Freq.:	5.0
Filter:	Fixed	Mode:	PE
Voltage:	Fixed	Other:	Fullwave
Ax. Gain (dB):	36.2	Circ. Gain (dB):	52.5
1 Screen Div. =	.10	in. of	Sound Path
Linearity Report No.:	L-11-085		

Calibration Block

Cal. Block No.	8279-0410		
Thickness	0.344	Dia.:	2.375
Cal. Blk. Temp.	72	Temp. Tool:	MCNDE40129
Comp. Temp.	67	Temp. Tool:	MCNDE40129

Search Unit

Serial No.:	00DBVW		
Manufacturer:	KBA		
Size:	0.25	Shape:	Round
Freq.:	5 MHz	Style:	Comp - G
Exam Angle:	45	# of Elements:	SINGLE
Mode:	SHEAR		
Measured Angle:	45		
Wedge Style:	MSWQC		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☑	Downstream ☑	Scan dB:	41.4
CW ☑	CCW ☑	Scan dB:	52.5
Exam Surface:	O.D.		
Surface Condition:	Smooth		

Cal. Checks	Time	Date
Initial Cal	1245	3/1/2011
Inter. Cal.		
Inter. Cal.	1612	3/1/2011
Inter. Cal.		
Final Cal	1906	3/1/2011

Couplant

Cal. Batch:	09325
Type:	ULTRAGEL II
Mfg.:	SONOTECH
Exam Batch:	09325
Type:	ULTRAGEL II
Mfg.:	SONOTECH

Reference Block

Serial No.:	97-5590
Type:	ROMPAS

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
ID Notch	81	4.5	.446

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
ID Notch	81	5.4	.540

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
52.5	FSDH	80	9.6	.962

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☐ Reject ☑ Info ☐

Comments: Initial Section XI Exam

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: No

Examiner	Level II-N	Signature	Date	Reviewer		Signature	Date
Ellis II, Kenneth R.			3/1/2011				3-9-11
Examiner	Level II-N	Signature	Date	Site Review		Signature	Date
Lester, Robert M.			3/1/2011				
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A							3-15-11

Duke Energy.

UT Calibration / Examination

Site/Unit:	McGuire / 2	Procedure:	PDI-UT-2	Outage No.:	M2-20
Summary No.:	M2.R1.11.0276	Procedure Rev.:	E	Report No.:	UT-11-159
Workscope:	ISI	Work Order No.:	01929201	Page:	2 of 6

Code:	1998/2000 Addenda	Cat./Item:	R-A/R1.11	Location:	Rx Bldg.
Drawing No.:	MCFI-2NV216	Description:	Pipe To Pipe		
System ID:	NV				
Component ID:	2NV2FW216-60	Size/Length:	N/A	Thickness/Diameter:	0.344/2.0/SS
Limitations:	Yes - See attached sheets (welded pipe support)	Start Time:	1630	Finish Time:	1642

Instrument Settings

Serial No.:	011MBT		
Manufacturer:	KRAUTKRAMER		
Model:	USN-60		
Delay:	6.7906	Range:	2.5
M'tl Cal/Vel:	.123	Pulser:	High
Damping:	1K	Reject:	0%
Rep. Rate:	Autohigh	Freq.:	2.25
Filter:	Fixed	Mode:	PE
Voltage:	Fixed	Other:	Fullwave
Ax. Gain (dB):	61.0	Circ. Gain (dB):	N/A
1 Screen Div. =	.25	in. of	Sound Path
Linearity Report No.:	L-11-085		

Calibration Block

Cal. Block No.	8279-0410		
Thickness	0.344	Dia.:	2.375
Cal. Blk. Temp.	72	Temp. Tool:	MCNDE40129
Comp. Temp.	67	Temp. Tool:	MCNDE40129

Recordable Indication(s): Yes ☐ No ☑ (If Yes, Ref. Attached Ultrasonic Indication Report.)

Results: Accept ☐ Reject ☑ Info ☐

Search Unit

Serial No.:	00DC6W		
Manufacturer:	KBA		
Size:	0.25	Shape:	Round
Freq.:	2.25 MHz	Style:	Comp - G
Exam Angle:	70	# of Elements:	SINGLE
Mode:	SHEAR		
Measured Angle:	67		
Wedge Style:	MSWQC		

Search Unit Cable

Type:	RG-174		
Length:	6'	No. Conn.:	0

Scan Coverage

Upstream ☑ Downstream ☑ Scan dB: 58.0
CW ☐ CCW ☐ Scan dB: N/A
Exam Surface: O.D
Surface Condition: Smooth

Cal. Checks	Time	Date
Initial Cal	1312	3/1/2011
Inter. Cal.		
Inter. Cal.	1630	3/1/2011
Inter. Cal.		
Final Cal	1905	3/1/2011

Couplant

Cal. Batch:	09325
Type:	ULTRAGEL II
Mfg.:	SONOTECH
Exam Batch:	09325
Type:	ULTRAGEL II
Mfg.:	SONOTECH

Reference Block

Serial No.:	97-5590
Type:	ROMPAS

Axial Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
ID Notch	81	3.9	.952

Circumferential Orientated Search Unit

Calibration Reflector	Signal Amplitude %	Sweep Division	Sound Path
N/A			

Reference/Simulator Block

Gain dB	Reflector	Signal Amplitude %	Sweep Division	Sound Path
52.6	NSDH	80	3.8	.950

Comments: Initial Section XI Exam

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: No

Examiner: Ellis II, Kenneth R.	Level: II-N	Signature: Kenneth R. Ellis	Date: 3/1/2011	Reviewer: D E Howard	Signature: D E Howard	Date: 3.9.11
Examiner: Lester, Robert M.	Level: II-N	Signature: Robert M Lester	Date: 3/1/2011	Site Review	Signature	Date
Other: N/A	Level: N/A	Signature	Date	ANII Review	Signature: J F Swan	Date: 3-15-11

DUKE POWER COMPANY
ISI LIMITATION REPORT

Component/Weld ID: 2NV2FW216-60 **Item No:** M2.R1.11.0276

remarks:

☒ NO SCAN — SURFACE — BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☒ 2 ☒ 1 ☐ 2 ☒ cw ☒ ccw

Due to welded pipe support.

FROM L 0 to L +/-1.75" INCHES FROM W0 CL to Beyond

ANGLE: ☒ 0 ☒ 45 ☐ 60 other 70° FROM N/A DEG to N/A DEG

☐ NO SCAN — SURFACE — BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☐ 2 ☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L _____ to L _____ INCHES FROM W0 _____ to _____

ANGLE: ☐ 0 ☐ 45 ☐ 60 other _____ FROM ____ DEG to ____ DEG

☐ NO SCAN — SURFACE — BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☐ 2 ☐ 1 ☐ 2 ☐ cw ☐ ccw

FROM L _____ to L _____ INCHES FROM W0 _____ to _____

ANGLE: ☐ 0 ☐ 45 ☐ 60 other _____ FROM ____ DEG to ____ DEG

☐ NO SCAN — SURFACE — BEAM DIRECTION
☐ LIMITED SCAN ☐ 1 ☐ 2 ☐ 1 ☐ 2 ☐ cw ☐ ccw

UT-11-159

FROM L _____ to L 4 INCHES FROM W0 _____ to _____

ANGLE: ☐ 0 ☐ 5 ☐ 60 other _____ FROM ____ DEG to ____ DEG

Sketch(s) attached ☒ yes ☐ No

Prepared By: Kenneth Ellis Level: II Date: 03/01/11 Sheet 3 of 6

Reviewed By: Date: 3.9.11 Authorized Inspector: Date: 3-15-11

AGGREGATE COVERAGE SHEET

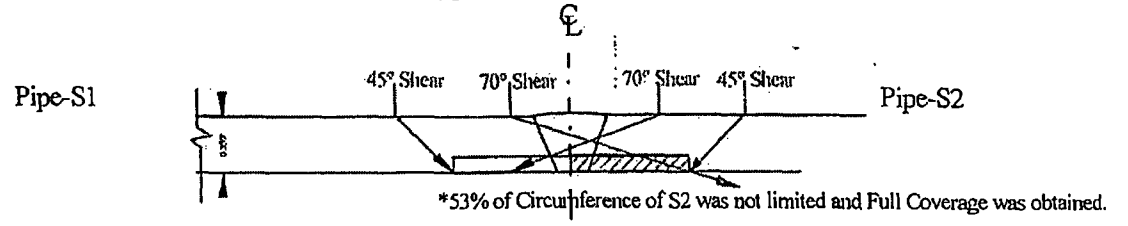
M2.R1.11.0276 / 2NV2FW216-60			
Angle/Scan	**% Length**	**% Volume**	**% Coverage**
45° - Scan 1	53.0	100	53.0
70° - Scan 1	47.0	50	23.5
Aggregate Coverage			**76.5**
70° - Scan 2	53.0	100	53.0
70° - Scan 2	47.0	0.0	0.0
Aggregate Coverage			**53.0**
45° - Scan 3	53.0	100	53.0
45° - Scan 3	47.0	50	23.5
Aggregate Coverage			**76.5**
45° - Scan 4	53.0	100	53.0
45° - Scan 4	47.0	50	23.5
Aggregate Coverage			**76.5**
Total Aggregate Coverage = 76.5 + 53.0 + 76.5 + 76.5 = 282.5/4 = 70.6%			

3/1/2011

M2.R1.11.0276
Weld No. 2NV2FW216-60

Note: *Welded Pipe Support 47% of Total Circ. of Weld Length.
Limitation +/- 1.75" from T.D.C due to Pipe support.
See Attached Limitation sheets

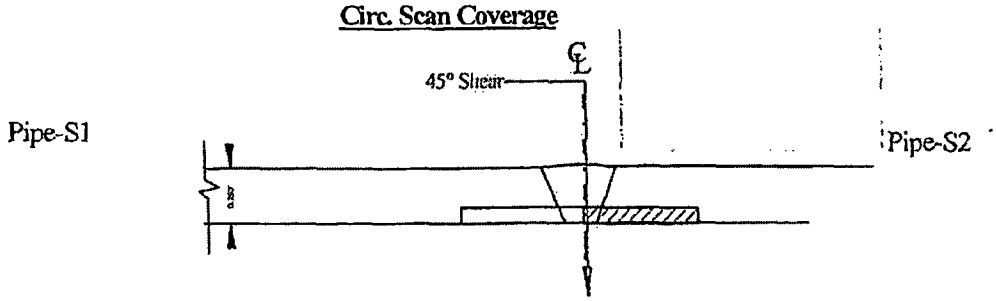
Axial Scan Coverage



*53% of Circumference of S2 was not limited and Full Coverage was obtained.

*See Notes above.

Circ. Scan Coverage



Scale : 1" = 1"

% Coverage Calculations

S1 = Pipe	=	76.5%	(100% of the length x 76.5% of the volume)
S2 = Pipe =		53%	(100% of the length x 53% of the volume)
S3 = CW	=	76.5%	(100% of the length x 76.5% of the volume)
S4 = CCW	=	76.5%	(100% of the length x 76.5% of the volume)

Total = 282.5 / 4 = 70.6 % Aggregate Coverage

Inspector / Date: [signature] 3/1/2011

ATTACHMENT A
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Duke Energy.

Determination of Percent Coverage for UT Examinations - Pipe

Site/Unit:	McGuire / 2	Procedure:	PDI-UT-2	Outage No.:	M2-20
Summary No.:	M2.R1.11.0276	Procedure Rev.:	E	Report No.:	UT-11-159
Workscope:	ISI	Work Order No.:	01929201	Page:	6 of 6

45 deg

Scan 1		% Length X		% volume of length / 100 =		% total for Scan 1
Scan 2		% Length X		% volume of length / 100 =		% total for Scan 2
Scan 3	100.000	% Length X	76.500	% volume of length / 100 =	76.500	% total for Scan 3
Scan 4	100.000	% Length X	76.500	% volume of length / 100 =	76.500	% total for Scan 4

Add totals and divide by # scans = 76.500 % total for 45 deg

Other deg - 70 (to be used for supplemental scans)

The data to be listed below is for coverage that was not obtained with the 45 deg scans.

Scan 1	100.000	% Length X	76.500	% volume of length / 100 =	76.500	% total for Scan 1
Scan 2	100.000	% Length X	53.000	% volume of length / 100 =	53.000	% total for Scan 2
Scan 3		% Length X		% volume of length / 100 =		% total for Scan 3
Scan 4		% Length X		% volume of length / 100 =		% total for Scan 4

Percent complete coverage

Add totals for each scan required and divide by # of scans to determine;

70.625 % Total for complete exam

Site Field Supervisor: David K. Bowers III Date: 03/08/11

ATTACHMENT A
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