CATAWBA NUCLEAR STATION
UNIT 2
EVALUATION OF 2EOC13 ISI
FLAW IN SG2C TO HOT LEG WELD
CNC-2201.01-00-0006

Form 101.1 (R08-04)

CERTIFICATION OF ENGINEERING CALCULATION

Station And Unit Number: Catawba Nuclear Station, Unit 2

Title Of Calculation: Evaluation of 2EOC13 ISI Flaw in SG2C to Hot Leg Weld

Calculation Number: CNC-2201.01-00-0006

Total Original Pages: 1 Through: 8

Total Supporting Documentation Attachments: 1 (A) Total Microfiche Attachments: —

Total Volumes: 1 Active Calculation/Analysis Yes ☐ No ☒

Microfiche Attachment List ☐ Yes ☒ No (See Form 101.4) If Active, is this a Type 1 Calculation/Analysis Yes ☐ No ☐

These engineering Calculations cover QA Condition 1 Items. In accordance with established procedures, the quality has been assured and I certify that the above Calculation has been Originated, Checked, or Approved as noted below:

Originated By: Bill Calloway Date: 10-13-04

Checked By: James F Willis Date: 10-13-04

Verification Method: Method 1 ☒ Method 2 ☐ Method 3 ☐ Other ☐

Approved By: David L. Ward Date: 10-13-04

Issued To Document Management: DLW Date: 10-13-04

Received By Document Management: Dal Date: 10-13-04

Complete The Spaces Below For Documentation Of Multiple Originators Or Checkers

Pages _____ Through _____

Originated By _____ Date _____

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Pages _____ Through _____

Originated By _____ Date _____

Checked By _____ Date _____

Verification Method: Method 1 ☐ Method 2 ☐ Method 3 ☐ Other ☐

Pages _____ Through _____

Originated By _____ Date _____

Checked By _____ Date _____

Verification Method: Method 1 ☐ Method 2 ☐ Method 3 ☐ Other ☐

Form 101.2 (R3-03)

File/Calculation No. CNC-2201.01-00-0006

REVISION DOCUMENTATION SHEET

Revision Number	Revision Description
0	Original Issue

Statement of Problem / Purpose

This calculation has been performed to address an indication discovered on the 2C Steam Generator to Hot Leg weld during 2EOC13. This particular weld is located between the cast low alloy steel primary channel head of the steam generator and the cast austenitic stainless steel elbow. Typically, the volumetric examination under Section XI of the ASME Code would be performed using an ultrasonic examination. However, the cast austenitic stainless steel material of the reactor coolant loop piping precludes the use of the ultrasonic examination methodology. The ultrasonic examination was replaced with a radiographic examination.

QA Condition

This calculation is QA Condition 1 because it serves as the basis for continued qualification of a Duke Class A, ASME Class 1 component.

Analysis Methodology

This calculation verifies that the structural integrity of the steam generator 2C nozzle to hot leg weld is maintained under all operating and design loading conditions, even with the identified flaw. The verification has been performed by conservatively bounding the flaw characteristics and comparing this bounding flaw against allowable flaw depths provided by a Westinghouse flaw evaluation handbook [7] specific to this reactor coolant loop location.

Other Evaluation Criteria

No other evaluation criteria have been used.

Applicable Licensing References

L. 1 Catawba UFSAR, September 27, 2003 issue date, Sections 3.9 and 5.2

L. 2 Catawba Selected Licensee Commitments 16.5.5, Reactor Coolant System, Structural Integrity, Rev 0

Assumptions/Engineering Judgments

As noted in body of calculation

References

1 ASME Code, Section III, Subsections NB and NC, 1974 Edition with Summer 1974 Addenda.

2 ASME Code, Section XI, 1989 Edition, No addenda

3 Westinghouse sketch EDSK 380335B, from CNM-2201.01-0217

4 Westinghouse sketch EDSK 380329B, from CNM-2201.01-0217

5 CNM-1201.01-0076, Rev 0, ESCO drawing AA-43234, , Weld Bevel Detail, 31.00 I. D. Elbows, Nozzle Ends

6 CNM-2201.01-0008, Rev B, ESCO drawing AD-22321, Machining – 31.00 I.D. x 29.00 I.D. Long Radius 50° Reducing Weld Elbow

7 WCAP-15658-P, September, 2004, Flaw Evaluation Handbook for Catawba Unit 2 Steam Generator Primary Nozzle Weld Regions.

8 CN-2553-1.0, Rev 22, NC Flow Diagram.

9 CN-2NC-0013, Rev 13, Weld Isometric.

10 PIP C-04-5421

Calculation/Evaluation

This calculation was performed by determining the bounding characteristics of the indication and comparing parameters associated with this indication to values in the Westinghouse supplied flaw analysis handbook [7].

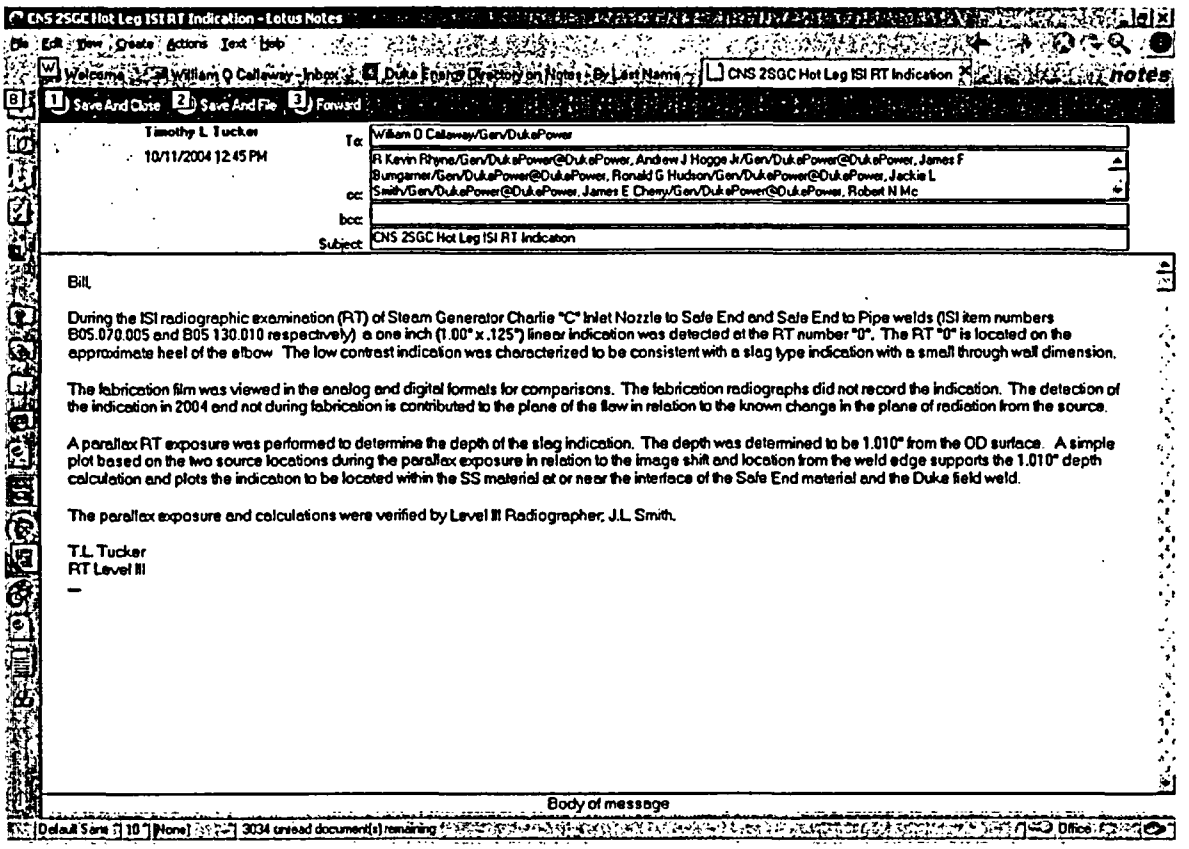
Nozzle Configuration

The nozzle connection consists of a low alloy steel casting that forms the channel head of the steam generator. This casting has been buttered with a low carbon, stainless steel weld metal. The piping to buttering field weld is made after post weld heat treatment of the steam generator channel head. The Duke weld number is 2NC-13-2 and the weld process control from the original fabrication is included as Attachment A. This weld is a full penetration, compound V groove weld made from the outside of the pipe. The GTAW (TIG) process was used for the first inch, followed by a "courtesy" radiograph (RT). Subsequent welding was performed using the SMAW (stick) process to finish out the weld. After completion of welding, a final RT was performed and accepted on the weld. In addition, liquid penetrant tests (PT's) were performed on the interior and exterior surfaces of the weld.

Flaw Geometry

The flaw is located at the bottom of the pipe in the C hot leg. It is approximately at bottom dead center of the pipe. Based on the radiographic data, the flaw is 1" long and oriented in the circumferential direction. Since the examination was performed using RT, a limited amount of information was available to characterize the flaw. The location of the flaw relative to the OD surface was established using parallax radiographic shots. These shots support a minimal flaw depth. However, because of the uncertainty in flaw depth, a bounding case has been reviewed herein.

Radiography Evaluation



CNS 2SGC Hot Leg ISI RT Indication - Lotus Notes

File Edit View Create Actions Text Help

Welcome | William O Calloway - Inbox | Duke Energy Directory on Notes - By Last Name | CNS 2SGC Hot Leg ISI RT Indication | notes

1 Save And Close 2 Save And File 3 Forward

Timothy L Tucker
10/11/2004 12:45 PM

To: William O Calloway/Gen/DukePower
R Kevin Rhyne/Gen/DukePower@DukePower, Andrew J Hogge Jr/Gen/DukePower@DukePower, James F Bumgarner/Gen/DukePower@DukePower, Ronald G Hudson/Gen/DukePower@DukePower, Jackie L Smith/Gen/DukePower@DukePower, James E Cherry/Gen/DukePower@DukePower, Robert N Mc
cc:
bcc:
Subject: CNS 2SGC Hot Leg ISI RT Indication

Bill,

During the ISI radiographic examination (RT) of Steam Generator Charlie "C" Inlet Nozzle to Safe End and Safe End to Pipe welds (ISI item numbers B05.070.005 and B05.130.010 respectively) a one inch (1.00" x .125") linear indication was detected at the RT number "0". The RT "0" is located on the approximate heel of the elbow. The low contrast indication was characterized to be consistent with a slag type indication with a small through wall dimension.

The fabrication film was viewed in the analog and digital formats for comparisons. The fabrication radiographs did not record the indication. The detection of the indication in 2004 and not during fabrication is contributed to the plane of the flaw in relation to the known change in the plane of radiation from the source.

A parallax RT exposure was performed to determine the depth of the slag indication. The depth was determined to be 1.010" from the OD surface. A simple plot based on the two source locations during the parallax exposure in relation to the image shift and location from the weld edge supports the 1.010" depth calculation and plots the indication to be located within the SS material at or near the interface of the Safe End material and the Duke field weld.

The parallax exposure and calculations were verified by Level III Radiographer, J.L. Smith.

T.L. Tucker
RT Level III

Body of message

Default Sans | 10 | None | 3034 unread document(s) remaining | Office

In addition to the radiography shots made to characterize the flaw, both the original construction film and the 2EOC13 film (non-parallax shots) were digitized. The original construction film was digitized to determine if the indication could be seen from initial fabrication welding. Digitization of the film can greatly enhance the visible interpretation of the film in some cases. Next, the 2EOC13 film was digitized and reviewed to determine if the linear indication was actually separated into multiple flaws. In both of these cases, there was no conclusive evidence from the digitization process that changed the film interpretation or flaw characteristics.

Based on the conclusions provided from the radiography review above, a best estimate characterization of the flaw has been provided. The flaw is located 1.01" from the outside surface of the piping in the stainless steel weld material. The flaw is oriented circumferentially with a length of 1.0". The flaw is most likely the result of a slag inclusion during fabrication. It has very little contrast that indicates a limited depth. It is located at the interface between the stainless steel buttering and the Duke stainless steel field weld.

The flaw location from the OD surface of 1.01" was considered from three positions relative to the flaw depth (top, center & bottom). The three positions were considered for two different aspect ratios. All six cases were found to be acceptable. Based on the method used to determine location, the center position is the most appropriate and is used in the documented flaw calculation below.

For the initial evaluation, the flaw depth will be assumed as ½ of the length and evaluated as an embedded flaw. From the flaw handbook, several parameters are necessary to determine the acceptability of the indication. These are provided below. The appropriate figure for the purposes of evaluation from reference [7] for a circumferential embedded flaw in the stainless steel material is Figure A-3.7.

a	=	half flaw depth (in)
	=	0.25 in.
l	=	length of flaw (in)
	=	1.0 in.
t	=	wall thickness (in)
	=	3.25 in.

Note: The wall thickness is based on profiling of weld using UT probe. Value of 3.25" is conservative and represents the lowest reading throughout the weld region of interest. See page 8 for the UT profile readings at the location of interest.

δ	=	distance to flaw centerline
	=	1.01 in.
δ / t	=	1.01 / 3.25
	=	0.311
a / t	=	0.25 / 3.25
	=	0.077

The δ / t and a / t parameters may be plotted on Figure A-3.7 to determine the acceptability of the flaw. This point (A) is shown on the attached sketch.

In addition to the above evaluation, the flaw depth was increased to 1" yielding an aspect ratio of 1:1. In this case, the parameters change as noted below:

a	=	half flaw depth (in)
	=	0.50 in.
l	=	length of flaw (in)
	=	1.0 in.
t	=	wall thickness (in)
	=	3.25 in.
δ	=	distance to flaw centerline

	=	1.01 in.
δ / t	=	1.01 / 3.25
	=	0.311
a / t	=	0.50 / 3.25
	=	0.154

Again, the δ / t and a / t parameters have been plotted on Figure A-3.7 as point (B) to determine the acceptability of the flaw.

Results

In both cases evaluated above, it is clearly evident that the flaw is within the bounds of the acceptability provided by Figure A-3.7 of reference [7]. As a result, the piping containing this flaw is acceptable for continued service for the design life of the plant. The figure in reference [7] indicates 10, 20 and 30 year acceptance lines. These lines are related to the design number of occurrences of transients used in the fatigue crack growth calculation. As such, this indication is acceptable for life of plant provided a prorated value (30 / 40 = 75%) of the design number of occurrences are not exceeded between now and end of plant life. This limit on fatigue cycle counts will be tracked under our fatigue management program.

Conclusion

The flaw discovered during 2EOC13 is acceptable without repair for the life of plant. Acceptance by the performance of analytical evaluation as allowed by ASME XI, IWB-3132.4 has been validated. Additional examinations have been performed during 2EOC13 to satisfy IWB-2430. Successive examinations for the SG2C hot leg weld number 2NC-13-2 will be necessary in the subsequent three ISI periods as required by IWB-2420.

Page 7

Proprietary

Energy.

Supplemental Report

Report No.: _____

Page: ____ of ____

Summary No.: B05.070.007

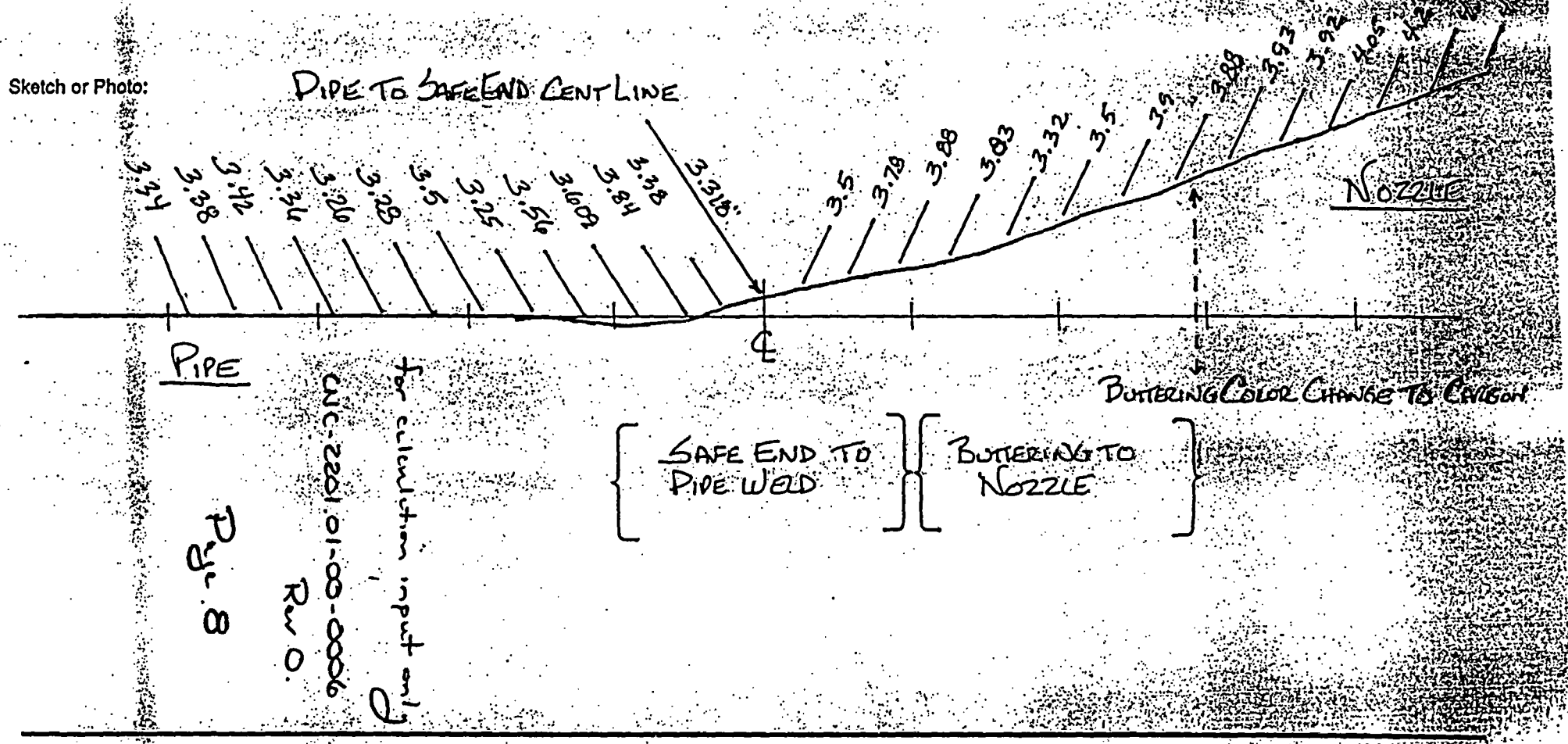
Examiner: [signature] Level: III Reviewer: _____ Date: _____

Examiner: [signature] Level: III Site Review: _____ Date: _____

Other: _____ Level: _____ ANII Review: _____ Date: _____

Comments:

Sketch or Photo:

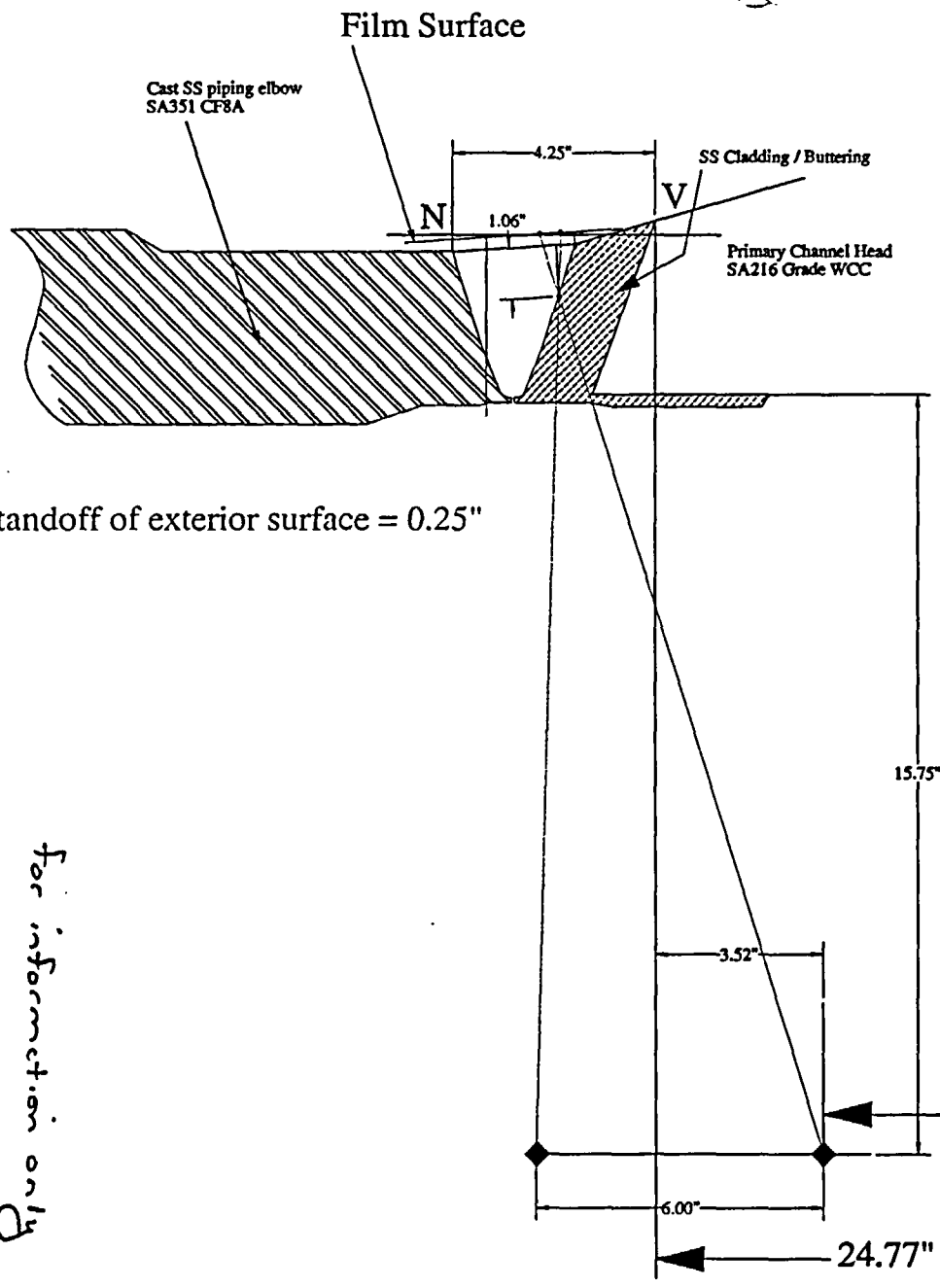


for elevation input only

CNC-2201.01-00-0006 Rev 0.

Rev. 8

CNS Steam Generator 2C Hot Nozzle Indication



Film standoff of exterior surface = 0.25"

Source Location

21.25" from back of nozzle dam ring

24.77" from back of nozzle dam ring

for information only

Reference Drawings:
1) CNM-2201.01-0008
2) CNM-1201.01-0076

Page A-3
A-4

Proprietary

25585
5/23/80

RELATED MATERIAL ATTACHED

FORM M-4A	REVISION 15

	INITIAL	DATE
ORIGINATOR	[illegible]	22AUG80
MECH. CHECK	[illegible]	8/27/80
WELD CHECK	[illegible]	8/27/80
QA REVIEW	RGR	8/28/80

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT CATAWBA

WELD PROCESS CONTROL SHEET

PRE-APPROVED	☐ YES ☒ NO
INFO IDENT	
INFO REV. NO.	

Weld No. 2NC 13-2 Class A
Drawing No. CN-2NC-13
F-9B Required Yes ☑ No ☐ Type Weld BUTT
Pipe Size 31" Joint Thickness 3.22"
Material SS(P-8)(304)
Remarks
FINAL "PT" TO INCLUDE I.D. AND O.D.

F.W.D.S. L-206 AND/OR L-211 ROOT
L-260 AND/OR L-304 FILL
Preheat 60°F MIN PWHT Data Sheet NA
Repair NDE NDE-30J
Final NDE NDE-30J [illegible] NDE-10
Remarks WELDING ON I.D. IS PERMISSIBLE

ANI REVIEW K DATE 9-2-80

Hold Pt	Witness Pt		INSPECTION (DO NOT PASS HOLD POINTS UNTIL SIGNED OFF)	ORIGINAL Initial	DATE	REPAIR Initial	DATE	REPAIR Initial	DATE	ANI INSPECTION Initial	DATE
	X	1	Repair NDE Proc NDE30J Rev. 7	CDJ	9-16-80						
	X	2	Cleanliness	HEE	9-17-80						
	X	3	Fit-Up	[illegible]	10-2-80						
	X	4	Purge	HEE	10-10-80						
	X	5	Preheat	HEE	10-10-80						
	X	6	Visual Inspection	KWK	1-5-81						
	X	7	Inservice Inspection Prep. (Criteria CP 106)	KWK	1-9-81						
	X	8	NDE Inspections								
			a PT Proc. NDE 30-J Rev. 9	KTH	1-15-81						
			b MT Proc. NA Rev.								
			c UT Proc. NA Rev.								
			d RT Proc NDE10 Rev. 3 Q.C	KWW	1-21-81						
			Q.A	[illegible]	1-23-81					[illegible]	1-26-81
		9	PWHT Proc. Rev.								

MT Machine Serial Number
Viewing Port Used, RT interval ☐ Yes ☒ No. ☐ Yes ☐ No. ☐ Yes ☐ No.
Form M-4L Used ☒ Yes ☐ No

WELD INFORMATION RECORDS

Repair No.	Welder Initial	Stencil Number	Filler Size	Filler Type	Heat/Lot Number	F.W.D.S. Used/Rev	Date	Inspector	Date
0	GMR	N/A	5/32	AE308EB	E41031308	L206-8	9-22-80	[illegible]	10-2-80
0	WH	MSO	N/A	N/A	N/A	L-206-8	9-22-80	[illegible]	10-2-80
0	MRW	414	N/A	N/A	N/A	L206-8	10-10-80	KWK	1-8-81
0	MRW	414	1/16	ER308	04184	L211-8	10-10-80	KWK	1-8-81

RECORDS OF SURFACE DEFECTS BY MT/PT

A. Type of Defect
B. Defects removed, surface re-examined by MT/PT
C. MT machine serial no.
D. Weld acceptable without weld repair

TRACEABILITY RECORDS (A) (K)
Piping Materials Steam Gen
Heat Numbers D00T-1901
NDE Piece Mark OK [illegible] 3/19/81
Backing ring heat no. NA
Valve NA Serial Number NA
NA NA

FINAL QA APPROVAL [illegible] DATE 3/21/81

NCI 9978

Attachment A pg 1
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rev 0

(A.)

~~No~~ 10-2-80

Nitleg 2C-1 ~~183~~ GMR

18842 ✓ 4-17-83

25510
11/15/79

FORM F-9B	REVISION 7

	INITIAL	DATE
ORIGINATOR	DEG	27AUG80
MECH. CHECK	[illegible]	8/27/80
WELD CHECK	[illegible]	8/27/80
Q.A. REVIEW	RGR	8-28-80

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT CATAWBA

Sheet 1 of 1

PRE-APPROVED ☐ YES ☒ NO
INFO. IDENT.
INFO. REV. NO.

DETAILED PROCESS CONTROL SHEET

SYSTEM NC DRAWING/~~SKETCH~~ NO. CN-2NC-13
WELD NUMBER 2NC 13-2 CONTROL SHEET REVISION NO. 0

ANI REVIEW
DATE 9-2-80
INSPECTION POINT YES ☐ NO ☒

OPERATION NUMBER	OPERATION DESCRIPTION	INSPECTOR CRAFTSMAN	DATE	ANI HOLD PT	ANI INITIAL	DATE
0	POLISH SAFE-END USING "FLAP" TYPE WHEEL. (CRAFT)	EWW	9-10-80			
0A	RINSE WITH DEMINERALIZED WATER. (CRAFT)	EWW	9-10-80			
1	"PT" OF WELD PREP TO BE DOCUMENTED AT THIS STEP. (QC)	CDJ	9-11-80			
5A	AFTER APPROXIMATELY ONE INCH OF DEPOSITED WELD METAL. RT. PROD COURTESY REV ☐ ACCEPT ☒ REJECT (QC) DEG [illegible] 10/21/80 RGR 8-28-80 (QA)	KLW	10-21-80			
3	Allow land thickness of .055" to .105" when using L206. Top of land & ring may not be flush.	[illegible]	10-2-80			
5B	~~EOR~~ COURTESY RT ☒ ACC ☐ REJ (QC)	KLW	10-30-80			
[illegible]	[illegible] 10/30/80 (QA)	[illegible]	11/5/80			
		[illegible]	3/21/81			

DEG 17SEP80 RGR 9-17-80 [illegible] 9-17-80

Rols

Attach A, pg 3
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rev 0

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT Catawba

M-4A CONTINUATION SHEET

UNIT 2 SYSTEM NC SUBASSEMBLY/DRAWING NO. CN-2NC-13 WELD NO. 2NC13-2

PASS NO	WELDER INITIAL	WELDER SYMBOL NUMBER	FILLER SIZE	FILLER TYPE	HEAT/LOT NUMBER	FIELD WELD DATA SHEET USED/REV	DATE	INSPECTOR	DATE
0	WH	M80	1/16	ER308	~~04184~~ 04184	L-211-8	10-10-80	Kwk	1-8-81
0	WH	M80	3/32	ER308	C3064	L-211-8	10-10-80	Kwk	1-8-81
0	MRW	414	1/16	ER308	04184	L-211-8	10-10-80	Kwk	1-8-81
0	MRW	414	3/32	ER308	C3064	L-211-8	10-10-80	Kwk	1-8-81
0	WH	M80	3/32	ER308	C3064	L-211-8	10-10-80	Kwk	1-8-81
0	MRW	414	3/32	ER308	C3064	L-211-8	10-10-80	Kwk	1-8-81
0	WH	M80	1/8	ER308	~~C3064~~ 06393	L-211-8	10-10-80	Kwk	1-8-81
0	MRW	414	1/8	ER308	06393	L-211-8	10-10-80	Kwk	1-8-81
0	WH	M80	1/8	ER308	06393	L-260-1	10-13-80	Kwk	1-8-81
0	MRW	414	1/8	ER308	06393	L-260-1	10-13-80	Kwk	1-8-81
0	WH	M80	1/8	ER308	06393	L-260-1	10-14-80	Kwk	1-8-81
0	JLH	H98	1/8	ER308	06393	L-260-1	10-14-80	Kwk	1-8-81
0	WH	M80	1/8	ER308	06393	L-260-1	10-14-80	Kwk	1-8-81
0	JLH	H98	1/8	ER308	06393	L-260-1	10-14-80	Kwk	1-8-81
0	WH	M80	1/8	ER308	06393	L-260-1	10-15-80	Kwk	1-8-81
0	JLH	H98	1/8	ER308	06393	L-260-1	10-15-80	Kwk	1-8-81
0	BR	P67	1/16	ER308	04184	L-260-1	10-28-80	Kwk	1-8-81
0	BR	P67	3/32	ER308	C3064	L-260-1	10-28-80	Kwk	1-8-81
0	BR	P67	3/32	ER308	C3064	L-260-1	10-29-80	Kwk	1-8-81
0	BR	P67	1/8	ER308	06393	L-260-1	10-29-80	Kwk	1-8-81
0	FRH	H06	1/8	ER-308	06393	L-260-1	12-10-80	Kwk	1-8-81
0	RRB	X89	1/8	ER-308	06393	L-260-1	12-10-80	Kwk	1-8-81
0	FRH	H06	1/8	ER-308	06393	L-260-1	12-11-80	Kwk	1-8-81
0	RRB	X89	1/8	ER-308	06393	L-260-1	12-11-80	Kwk	1-8-81
0	FRH	H06	1/8	ER-308	06393	L-260-1	12-12-80	Kwk	1-8-81
0	RRB	X89	1/8	ER-308	06393	L-260-1	12-12-80	Kwk	1-8-81
2	FRH	H06	1/8	E 308-16	8665	L-304-11	12-12-80	Kwk	1-8-81
2	RRB	X89	1/8	E 308-16	8665	L-304-11	12-12-80	Kwk	1-8-81
2	FRH	H06	1/8	E 308-16	8665	L-304-11	12-12-80	Kwk	1-8-81
2	FRH	H06	3/32	E 308-16	88505	L-304-11	12-12-80	Kwk	1-8-81

FINAL RECORDS CHECK: Signature Date 3/31/81

Attachment A, pg 4
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rev 0

25589
11/21/79

FORM M-4L | REVISION 1

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT LATAWBA

M-4A CONTINUATION SHEET

UNIT 2 SYSTEM N.C. SUBASSEMBLY/DRAWING NO CN-2NC-13 WELD NO 2NC-13-2

FILLER NO	WELDER INITIAL	TENCIL NUMBER	FILLER SIZE	FILLER TYPE	HEAT/LOT NUMBER	FILLER WELD DATA SHEET NUMBER	DATE	INSPECTOR	DATE
0	RRB	X89	3/32	E 308-16	8680E	L 304-11	12-15-80	KWK	1-8-81
0	RRB	X89	1/8	E 308-16	8665	L 304-11	12-15-80	KWK	1-8-81
0	FRH	H06	1/8	E 308-16	8665	L-304-11	12-15-80	KWK	1-8-81
0	FRH	H06	3/32	E 308-16	8680E	L 304-11	12-15-80	KWK	1-8-81
0	RRB	X89	3/32	E 308-16	8680E	L 304-11	12-15-80	KWK	1-8-81
0	RRB	X89	1/8	E 308-16	8665	L 304-11	12-15-80	KWK	1-8-81
0	FRH	H06	1/8	E 308-16	8665	L-304-11	12-16-80	KWK	1-8-81
0	FRH	H06	3/32	E 308-16	8680E	L-304-11	12-16-80	KWK	1-8-81
0	RRB	X89	3/32	E 308-16	8680E	L-304-11	12-16-80	KWK	1-8-81
0	RRB	X89	1/8	E 308-16	8665	L 304-11	12-16-80	KWK	1-8-81
0	FRH	H06	1/8	E 308-16	8665	L-304-11	12-16-80	KWK	1-8-81
0	FRH	H06	3/32	E 308-16	8680E	L-304-11	12-16-80	KWK	1-8-81
0	RRB	X89	3/32	E 308-16	8680E	L 304-11	12-16-80	KWK	1-8-81
0	RRB	X89	1/8	E 308-16	8665	L 304-11	12-16-80	KWK	1-8-81
0	RRB	X89	1/8	E 308-16	8665	L 304-11	12-17-80	KWK	1-8-81
0	RRB	X89	3/32	E 308-16	8680E	L 304-11	12-17-80	KWK	1-8-81
0	FRH	H06	3/32	E 308-16	8680E	L 304-11	12-17-80	KWK	1-8-81
0	FRH	H06	1/8	E 308-16	8665	L 304-11	12-17-80	KWK	1-8-81
0	FRH	H06	1/8	E 308-16	8665	L 304-11	12-17-80	KWK	1-8-81
0	FRH	H06	3/32	E 308-16	8680E	L 304-11	12-17-80	KWK	1-8-81
+ 0	RRB	X89	3/32	E 308-16	8680E	L 304-11	12-17-80	KWK	1-8-81
+ 0	RRB	X89	1/8	E 308-16	8665	L 304-11	12-17-80	KWK	1-8-81
0	RRB	X89	1/8	E 308-16	8665	L 304-11	12-18-80	KWK	1-8-81
0	RRB	X89	3/32	E 308-16	8680E	L 304-11	12-18-80	KWK	1-8-81
0	FRH	H06	3/32	E 308-16	8680E	L 304-11	12-18-80	KWK	1-8-81
0	FRH	H06	1/8	E 308-16	8665	L 304-11	12-18-80	KWK	1-8-81
0	FRH	H06	1/8	E 308-16	8665	L 304-11	12-18-80	KWK	1-8-81
0	FRH	H06	3/32	E 308-16	8680E	L 304-11	12-18-80	KWK	1-8-81
0	RRB	X89	3/32	E 308-16	8680E	L 304-11	12-18-80	KWK	1-8-81
0	RRB	X89	1/8	E 308-16	8665	L 304-11	12-18-80	KWK	1-8-81

FINAL RECORDS CHECK ... DOS 3/21/81

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25589
11/21/79

FORM M-4L | REVISION 1

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT Catawba

M-4A CONTINUATION SHEET

UNIT 2 SYSTEM NC SUBASSEMBLY/DRAWING NO. CN-2NC-13 WELD NO 2NC132

Repair No.	WELDER INITIAL	STENCIL NUMBER	FILLER SIZE	FILLER TYPE	HEAT/LOT NUMBER	FIELD WELD DATA SHEET NUMBER/REV	DATE	INSPECTOR	DATE
0	FRH	H06	1/8	E 308-16	8665	L-304-11	12-19-80	KWK	1-8-81
0	FRH	H06	3/32	E 308-16	8680E	L-304-11	12-19-80	KWK	1-8-81
0	RRB	X89	3/32	E 308-16	8680E	L-304-11	12-19-80	KWK	1-8-81
0	RRB	X89	1/8	E308-16	8665	L 304-11	12-19-80	KWK	1-8-81
0	FRH	H06	1/8	E 308-16	8665	L-304-11	12-19-80	KWK	1-8-81
0	FRH	H06	3/32	E 308-16	8680E	L 304-11	12-19-80	KWK	1-8-81
0	RRB	X89	3/32	E 308-16	8680E	L 304-11	12-19-80	KWK	1-8-81
0	RRB	X89	1/8	E 308-16	8665	L 304-11	12-19-80	KWK	1-8-81
0	RRB	X89	1/8	E 308-16	8665	L 304-11	12-22-80	KWK	1-8-81
0	RRB	X89	3/32	E 308-16	8680E	L 304-11	12-22-80	KWK	1-8-81
0	FRH	H06	3/32	E 308-16	8680E	L 304-11	12-22-80	KWK	1-8-81
0	FRH	H06	1/8	E 308-16	8665	L 304-11	12-22-80	KWK	1-8-81
0	FRH	H06	1/8	E 308-16	8665	L 304-11	12-22-80	KWK	1-8-81
0	FRH	H06	3/32	E 308-16	8680E	L 304-11	12-22-80	KWK	1-8-81
0	RRB	X89	3/32	E 308-16	8680E	L 304-11	12-22-80	KWK	1-8-81
0	RRB	X89	1/8	E 308-16	8665	L 304-11	12-22-80	KWK	1-8-81
0	RRB	X89	1/8	E 308-16	8665	L 304-11	12-29-80	KWK	1-8-81
0	RRB	X89	3/32	E 308-16	8680E	L 304-11	12-29-80	KWK	1-8-81
0	FRH	H06	3/32	E 308-16	8680E	L 304-11	12-29-80	KWK	1-8-81
0	FRH	H06	1/8	E 308-16	8665	L 304-11	12-29-80	KWK	1-8-81
0	FRH	H06	1/8	E 308-16	8665	L 304-11	12-29-80	KWK	1-8-81
0	FRH	H06	3/32	E 308-16	8680E	L 304-11	12-29-80	KWK	1-8-81
0	RRB	X89	3/32	E 308-16	8680E	L 304-11	12-29-80	KWK	1-8-81
0	RRB	X89	1/8	E 308-16	8665	L 304-11	12-29-80	KWK	1-8-81
0	RRB	X89	1/8	E 308-16	8665	L 304-11	12-30-80	KWK	1-8-81
0	RRB	X89	3/32	E 308-16	8680E	L 304-11	12-30-80	KWK	1-8-81
0	FRH	H06	3/32	E 308-16	8680E	L 304-11	12-30-80	KWK	1-8-81
0	FRH	H06	1/8	E 308-16	8665	L 304-11	12-30-80	KWK	1-8-81
0	RRB	X89	1/8	E 308-16	8665	L 304-11	12-30-80	KWK	1-8-81
0	RRB	X89	3/32	E 308-16	8680E	L 304-11	12-30-80	KWK	1-8-81

pds

[illegible] pds 3/21/81

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FORM M-4L | REVISION 1

DUKE POWER COMPANY
CONSTRUCTION DEPARTMENT
PROJECT Catawba

M-4A CONTINUATION SHEET

UNIT 2 SYSTEM NC SUBASSEMBLY/DRAWING NO CN-2NC-13 WELD NO 2NC 13-2

Item No	Welder Initial	Stencil Number	Filler Size	Filler Type	Heat/Lot Number	Filler Wire Data Sheet Used/Rev	Date	Inspector	Date
0	FRH	H06	1/8	E308-16	8665	L304-11	12-30-80	KWK	1-8-81
0	FRH	H06	3/32	E308-16	8680E	L304-11	12-30-80	KWK	1-8-81
0	FRH	H06	3/32	E308-16	8680E	L-304-11	12-31-80	KWK	1-8-81
0	FRH	H06	1/8	E308-16	8665	L-304-11	12-31-80	KWK	1-8-81
0	RRB	X89	1/8	E308-16	8665	L304-11	12-31-80	KWK	1-8-81

Dds

FINAL RECORDS ... Dds ... 3/21/81

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PIP Serial No:	Action Category:	LER No:	Other Report:
C-04-05421	3		

Problem Identification

Discovered Time/Date: 10:33 10/11/2004 **Occurred Time/Date:** 10/07/2004

Unit(s) Affected:

Unit	Mode	%Power	Unit Status Remarks
2	NOMODE		

System(s) Affected:
NC Reactor Coolant

Affected Equipment

(No Equipment Affected)

Location of Problem:
Bldg: RX Column Line: Elev:

Location Remarks:
S/G 'C'

Method Used to Discover Problem:
RT (ISI) of S/G'C' Inlet/outlet nozzle weld

Brief Problem Description:
Linear indication of 1 inch found in S/G 'C' on Hot leg during RT(radiography)

Detail Problem Description:
Linear indication of 1 inch found in S/G 'C" hot leg nozzle weld duirng RT.Linear indication of 1 inch exceeds the acceptance standards of NDE-12, ASME Code Sections III and XI.(Procedure NDE 12 Rev. 11, Appendix A, ASME Code XI IWB-3514, ASME Code Section III NB-5320). Slag indication of 1 inch in length located at RT film interval number '0'. The indication was not visible on the construction radiographs. A change in the source position in relation to the plane of the flaw was determined to be the basis for the flaw detection in 2004 and not during the fabrication RT. This is a reportable indication.

Originated By: JFB8158: BUMGARNER, JAMES F Team: JLW3805 Group: IWS Date: 10/11/2004

Other Units/Components/Systems/Areas Affected(Y,N,U): U

Industry Plants Affected(Y,N,U): U

Immediate Corrective Actions:
Engineering to perform Fracture Mechanics Analysis.

Originated By: JFB8158: BUMGARNER, JAMES F Team: JLW3805 Group: IWS Date: 10/11/2004

Immediate Corrective Action Documents / Work Orders:

	Indiv	Team	Group	Date
Problem Identified By:	JFB8158	JLW3805	IWS	10/11/2004
Problem Entered By:	JFB8158	JLW3805	IWS	10/11/2004

Screening

Action Category: 3 Root Cause performed? No

PEP No:

Other Report Nos:

Event Codes:
F8 Testing

Screening Remarks:

Originated By: MLS9465: STANDRIDGE, MICKEY L Team: PAM7334 Group: SRG Date: 10/11/2004

Assignments:

Responsible Groups(s) for Problem Evaluation:	MCE	Mechanical/Civil Eng
Responsible Group for Present Operability:	N/A	
Responsible Group for Report Support Info:	N/A	
Responsible Group for Reportability:	N/A	
Responsible Group for Overall PIP Approval:	IWS	INSPEC. & WELD. SERV.

Signature Type	Indiv	Team	Group	Date
Screened By:	MLS9465	PAM7334	SRG	10/11/2004

Present Operability

Responsible Group: Status:

Sys/Comp Operable? (Y,N,C,E,T):

Required Mode:

Comments:

No Current Signatures For This Section

Reportability

Responsible Group: Status:

Problem Reportable(Y,N,E):

Reportable Per:

Comments:

No Current Signatures For This Section

Investigation Report:

Responsible Group: Act Date:

Investigator: Group:

Due Date:

Date Due to VP or Sta. Mgr:
Date Regulatory or Agency Rpt Due:
Date Investigation Report Approved:

NRC Cause Codes:

Report Support Info:

Responsible Group: Status:

No Current Signatures For This Section

Problem Evaluation

Event Cause Code	Cause Description	Primary	Causing Groups

Problem Evaluation From: Resp. Group: MCE Status: ReadyForAccept OEDB Checked: No

OEDB Comments:

Remarks Comments:

Signature Type	Indiv	Team	Group	Date
Assigned To:			MCE	10/11/2004
Due Date:	11/10/2004			

Corrective Actions

CA Seq. No: 1

Resp Group	Status	Orig Group	Event Code	Prop CAC	Cause Code
RGC	Open	IWS	F8	A2	YYY

Proposed Corrective Action:
Notify the NRC of the Reportable indication.

Originated By: JFB8158: BUMGARNER, JAMES F Team: JLW3805 Group: IWS Date: 10/11/2004
No Current Signatures For This Section

General: Outage: Mode:

Other Tracking Processes
Type Number Text

Actual Corrective Action:
Priority: N Actual CAC: Status: Due Date:

Signature Type	Indiv	Team	Group	Date
Assigned To:			RGC	10/11/2004

CA Seq. No: 2

Resp Group	Status	Orig Group	Event Code	Prop CAC	Cause Code
RGC	Open	IWS	F8	A2	YYY

Proposed Corrective Action:
Provide Fracture Mechanics Analysis data to the NRC for their review prior to unit re-start.

Originated By: JFB8158: BUMGARNER, JAMES F Team: JLW3805 Group: IWS Date: 10/11/2004
No Current Signatures For This Section

General:Outage: Mode:

Other Tracking Processes
Type Number Text

Actual Corrective Action:
Priority: N Actual CAC: Status: Due Date:

Signature Type	Indiv	Team	Group	Date
Assigned To:			RGC	10/11/2004

Final and Overall PIP Approval

Responsible Group: IWS Status: Screened

Signature Type	Indiv	Team	Group	Date
Assigned To:			IWS	10/11/2004

Any Supplemental Concurrence Signatures Above Do Not Affect PIP Closure.

Closure Document Type Closure Document No

Attachments

Generic Applicability

Responsible Group: Status:
GO PIP No:

Assessment Remarks:
No Current Signatures For This Section

Failure Prevention Investigation

No FPI Records for this PIP.

Remarks

No Remarks for this PIP.

Maintenance Rule

No Maintenance Rule Records for this PIP.

End of the Document for PIP No: C-4-5421
The status of this PIP is: Screened
The duration of this PIP was: 0 days

QA-516 A	Revision 4

Indication Evaluation Report

A

STATION	UNIT	ISI PLAN ITEM NUMBER	ISI PLAN ID NUMBER
Catawba	2	B05.070.005 B05.130.010	2SGC-INLET-SE 2NC13-02

NDE METHOD	NDE PROCEDURE USED	INDICATION SERIAL NUMBER
Radiography	NDE 12 REV. 11	S/N 1 (located at RT # 0)

DESCRIPTION OF ITEM CONTAINING INDICATION	DATE INSPECTED	EVALUATION NEEDED BY DATE
Steam Gen Inlet Nozzle to Safe End Weld Steam Gen Nozzle Safe End to Pipe weld	10/07/2004	10/11/2004

COMMENTS: **Slag indication 1.00" in length located at RT film interval number "0". The indication was not visible on the construction radiographs. A change in source position in relation to the plane of the flaw was determined to the basis for the flaw detection in 2004 and not during the fabrication RT.**

ORIGINATED BY: **T.L. Tucker** DATE: **10/11/2004**

B

ACCEPTANCE STANDARD USED: **Procedure NDE 12 Rev 11 Appendix A, ASME Code Sect. XI IWB-3514, ASME Code Sect. III NB-5320.**

CALCULATIONS/COMMENTS: **Linear indication length of 1.00" exceeds the acceptance standards of NDE 12, ASME Codes Sect. III and Sect. XI.**

EVALUATION STATUS = **Reportable**

Evaluated By
(NDE LEVEL III): **T.L. Tucker** DATE: **10/11/2004**

C

PIP SERIAL No: C-04-5421

ISI COORDINATOR: DATE:

D

ADDITIONAL INSPECTIONS ☐ NOT REQUIRED
☐ REQUIRED: ISI PLAN ADDENDA S/N: _____

SURVEILLANCE INSPECTIONS ☐ NOT REQUIRED
☐ REQUIRED: ISI PLAN ADDENDA S/N: _____

ISI PLAN MANAGER _____ DATE _____

E

DISPOSITION ☐ ACCEPTABLE IN ACCORDANCE WITH IWB-3600 (FMA)
☐ REPAIRED
☐ REPLACED

COMMENTS:

DISPOSITIONED BY (ISI Plan Manager) _____ DATE _____