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**Subject: Inspection Data for Use in Development of Alternate Pressurized Thermal Shock (PTS) Rule Implementation Regulatory Guide**

Dear Dr. Csontos:

This letter is in response to your request for reactor vessel inservice inspection data received by letter dated April 19, 2011. Westinghouse supports the NRC staff's efforts to develop an "Implementation Regulatory Guide" for the Alternate Pressurized Thermal Shock (PTS) Rule described in 10 CFR 50.61a. As such, Enclosure 1 to this response contains a compilation of ASME Section XI, Appendix VIII, inservice inspection data for the reactor vessel beltline welds of 13 pressurized water reactors.

Please contact me if you have any further questions.

Thank you.

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Fellow Engineer  
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Electronically Approved\*  
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## Enclosure 1: Reactor Vessel Inservice Inspection Data

This attachment provides ASME Section XI, Appendix VIII inservice inspection data for the reactor vessel beltline welds of 13 pressurized water reactors. There are some differences in the data from plant-to-plant due to differences in techniques or procedures used by ISI vendors.

- One ISI vendor explicitly identified whether a recorded indication was in the weld while the others did not.
- Some ISI vendors scan in the same direction that the UT beam is directed. In this case the tables report a “Beam Direction”. Other vendors direct the UT beam perpendicular to the direction of the scan. In this case, the “Scan Direction” is reported.

<b>Variable Definitions</b>	
<b>Parameter</b>	<b>General Description</b>
Beam Direction	The direction that the inspection instrument’s beam is directed when a RV indication is found. Allows for the determination of flaw orientation. The value is recorded as up (UP), down (DN), clockwise (CW), or counter-clockwise (CCW) with respect to the vessel or Parallel or Perpendicular with respect to the weld.
Scan Direction	The direction that the scan is performed. The UT beam is directed perpendicular to the direction of the scan.
L	The length of an embedded flaw. Flaw length is measured within the plane normal to the beam direction.
x	Location of the flaw as measured from the reactor vessel flange surface. In most instances, the dimension provided is for the location that provides the peak UT response. In cases of very long axial flaws, the dimension provided is the tip of the flaw that is closest to the core centerline (see notes to tables).
$\theta$	Azimuthal location of the flaw. Dimension provided is for the location that provides the peak UT response.
t	The measured thickness of the RV wall excluding the stainless steel cladding.
S	The location of an embedded flaw within the RV wall measured in the depth dimension. Unless otherwise noted, S is measured from the clad-to-base metal interface to the closest point of the flaw.
2a	The maximum through-wall thickness dimension of an embedded flaw. Key parameter in defining the size of this type flaw.
a	One-half the through-wall extent of the embedded flaw.
Weld Width	The width of the axial and circumferential welds within the beltline of the RV at approximately the clad-to-base metal interface.

**Plant A**

Reactor Vessel ISI History for Plant A					
Weld ISI No.	Region and Component Description	Date Last Inspected	Percent Coverage Obtained	Number of Recordable Indications	Number of Reportable Flaws
A-1	Nozzle Shell Forging to Intermediate Shell Forging Circ. Weld	2005	100%	1	None
A-2	Intermediate Shell Forging to Lower Shell Forging Circ. Weld	2005	100%	1	None

Reactor Vessel ISI Information for Potential Beltline Flaws Plant A															
Weld ISI No.	Weld Centerline (in.)	Weld Width (in.)	Indication No.	Beam Direction <sup>(a)</sup>	$\theta$ (°)	X (in.)	t (in.)	L (in.)	S (in.)	2a (in.)	a (in.)	a/L	a/t (%)	Allowable a/t (%)	ASME Code Disposition
A-1	145.98	.75	1	CW	89.0	145.2	8.625	1.6	0.623	0.22	0.11	0.069	1.28	2.31	Allowable
A-2	243.98	1.162	1	DN	57.47	242.7	8.625	0.75	2.76	0.12	0.06	0.08	0.69	2.38	Allowable

Notes:

(a) DN = Down, CW = Clockwise

Top of core position x=147.07 in.

Bottom of core position x=291.07 in.

Reactor Vessel Inner Diameter (without cladding)= 173.25 in.

Cladding Thickness= 0.125 in.

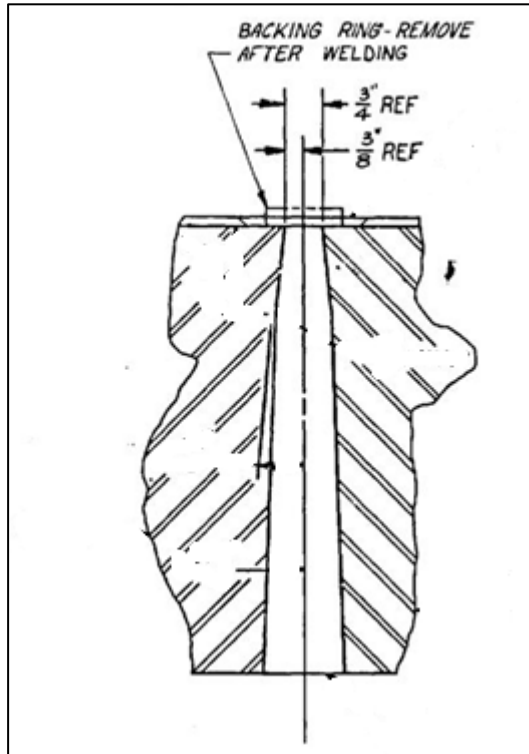


Figure 1: Plant A Nozzle Shell to Intermediate Shell Circ Weld

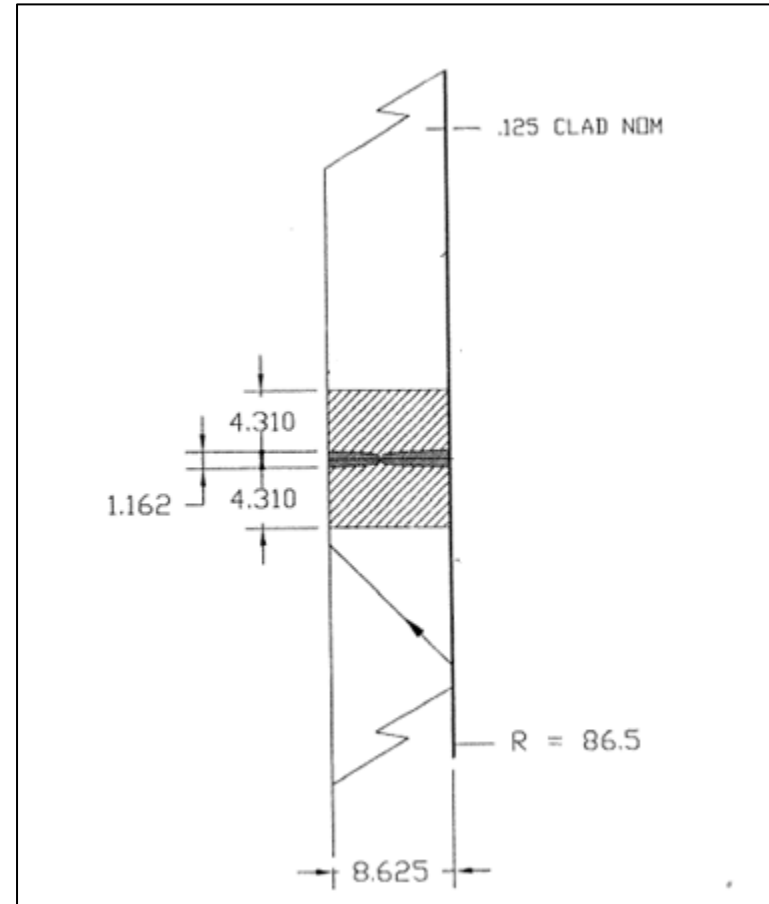


Figure 2: Plant A Intermediate Shell to Lower Shell Circ Weld

**Plant B**

Reactor Vessel ISI History for Plant B					
Weld ISI No.	Region and Component Description	Date Last Inspected	Percent Coverage Obtained	Number of Recordable Indications	Number of Reportable Flaws
B-1	Nozzle Shell Forging to Intermediate Shell Forging Circ. Weld	2007	100%	No Indications	None
B-2	Intermediate Shell Forging to Lower Shell Forging Circ. Weld	2007	100%	2	None

Reactor Vessel ISI Information for Potential Beltline Flaws Plant B															
Weld ISI No.	Weld Centerline (in.)	Weld Width (in.)	Indication No.	Beam Direction <sup>(a)</sup>	$\theta$ (°)	X (in.)	t (in.)	L (in.)	S (in.)	2a (in.)	a (in.)	a/L	a/t (%)	Allowable a/t (%)	ASME Code Disposition
B-2	242.50	1.24	1	DN	165.4	245.7	8.63	1.1	0.19	0.22	0.11	0.10	1.27	2.2	Allowable
	242.50	1.24	2	DN	350.1	246.2	8.63	0.6	0.065	0.125	0.063	0.10	0.72	2.5	Allowable

Notes:

(a) DN = Down

Top of core position x=147.07 in.

Bottom of core position x=291.07 in.

Reactor Vessel Inner Diameter (without cladding)= 173.38 in.

Cladding Thickness= 0.19 in.

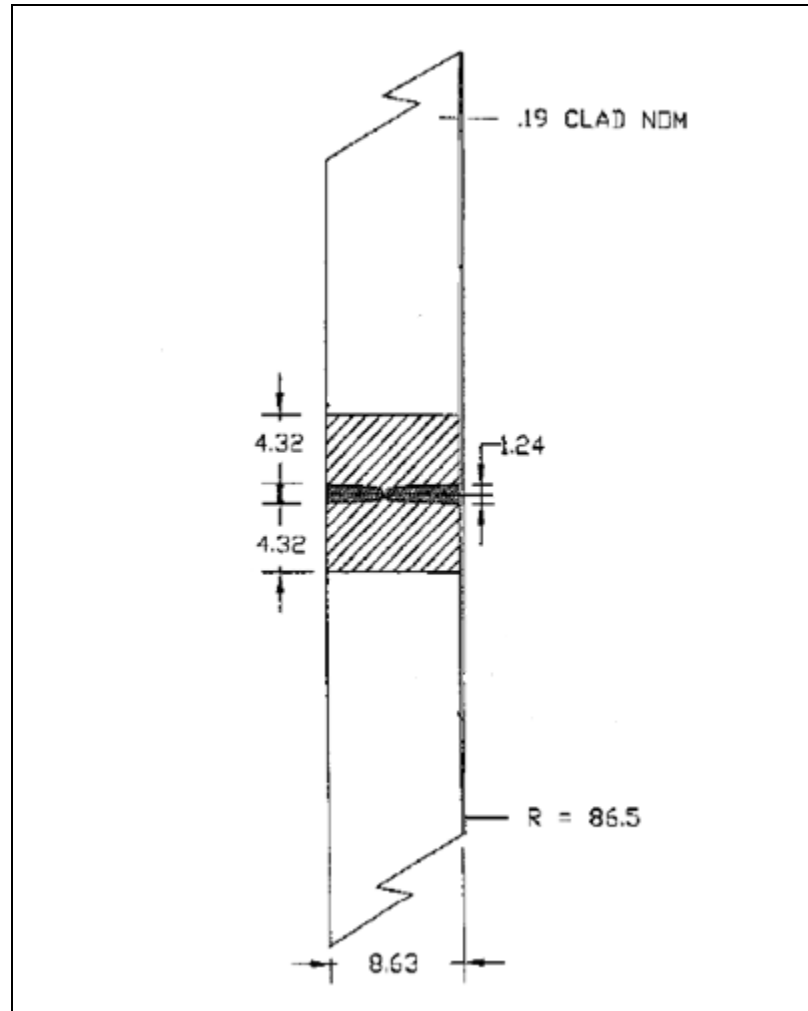


Figure 3: Plant B Circ Weld

**Plant C**

Reactor Vessel ISI History for Plant C Beltline Materials					
Weld ISI No.	Region and Component Description	Date Last Inspected	Percent Coverage Obtained	Number of Recordable Indications	Number of Reportable Flaws
C-1	Intermediate To Lower Shell Circ. Weld	2003	100%	No Indications	None
C-2	Intermediate Shell Long. Weld	2003	100%	1	None
C-3	Intermediate Shell Long. Weld	2003	100%	No Indications	None
C-4	Lower Shell Long. Weld	2003	100%	No Indications	None
C-5	Lower Shell Long. Weld	2003	100%	No Indications	None

Reactor Vessel ISI Information for Potential Beltline Flaws Plant C															
Weld ISI No.	Weld Centerline (in.) or (°)	Weld Width (in.)	Indication No.	Beam Direction <sup>(1)</sup>	θ (°)	X (in.)	t (in.)	L (in.)	S (in.)	2a (in.)	a (in.)	a/L	a/t (%)	Allowable a/t (%)	ASME Code Disposition
C-2	45°	.625	1	DN	48.14	140.9	7.75	1	0.26	0.125	0.063	0.05	0.81	2.28	Allowable

(1) DN=Down

Top of core position x=140.125 in.

Bottom of core position x=284.125 in.

Reactor Vessel Inner Diameter (without cladding)= 157.25 in.

Cladding Thickness= 0.125 in.

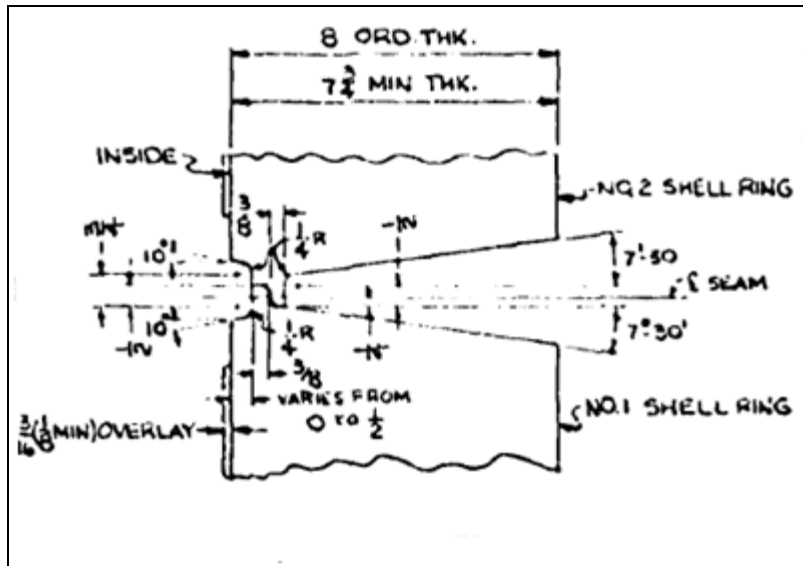


Figure 4: Plant C Circ Weld

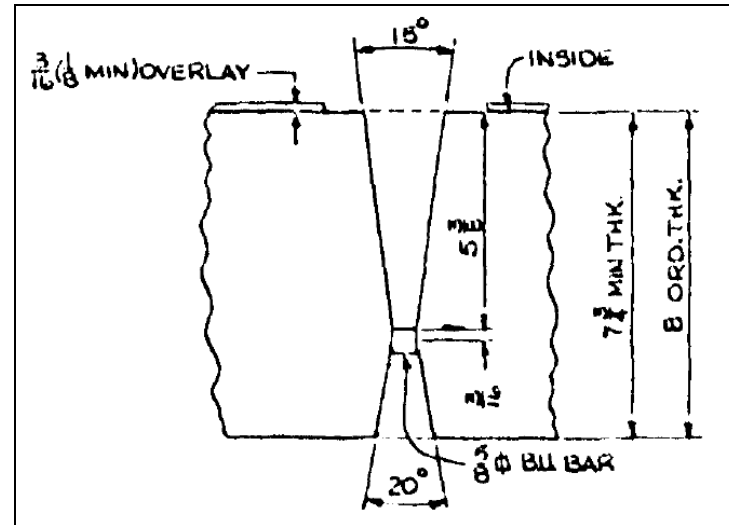


Figure 5: Plant C Axial Weld



**Plant D**

<b>Reactor Vessel ISI History for Plant D</b>					
Weld ID	Description	Date Last Inspected	Percent Coverage Obtained	Number of Recordable Indications	Number of Reportable Indications
D-1	Middle to Lower Shell Circ Weld	1998	96	1	0
D-2	Lower Shell to Lower Head Circ. Weld	1998	76	0	0
D-3	Middle Shell Longitudinal Weld	1998	100	0	0
D-4	Middle Shell Longitudinal Weld	1998	100	0	0
D-5	Middle Shell Longitudinal Weld	1998	96	1	0
D-6	Lower Shell Longitudinal Weld	1998	93	0	0
D-7	Lower Shell Longitudinal Weld	1998	100	0	0
D-8	Lower Shell Longitudinal Weld	1998	100	0	0

Reactor Vessel ISI Information for Potential Beltline Flaws Plant D																
Weld ID	Indication #	Scan Direction	Weld Centerline (in.) or (°)	Weld Width (in.)	x(in)	$\theta(^{\circ})$	2a(in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t(%)	Code Allowable a/t (%)	ASME Code Disposition
D-1	1	Parallel	232.00 in.	1.25	230.58	350.94	0.19	0.095	1.98	8.69	1.84	0.05	20.0	1.15	2.4	Allowable
D-5	2	Parallel	270°	1.375	143.00	271.00	N/A	0.210	0.8	8.69	N/A <sup>1</sup>	0.26	3.8	2.42	3.2	Allowable

Note 1: Indication is a surface flaw on the outside surface of the reactor vessel.

Top of core position x=147.15 in.

Bottom of core position x=283.85 in.

Reactor Vessel Inner Diameter (includes cladding)= 172 in.

Cladding Thickness= 0.3125 in.

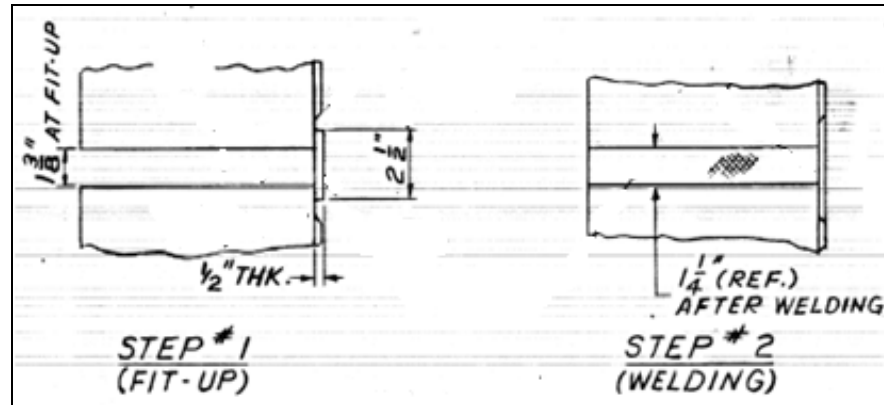


Figure 6: Plant D Circ Weld

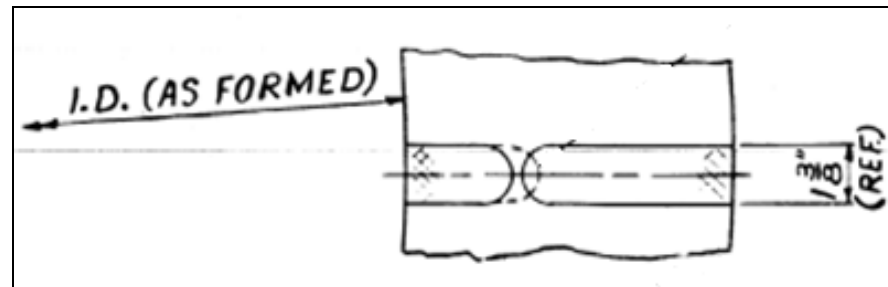


Figure 7: Plant D Axial Weld

**Plant E**

<b>Reactor Vessel ISI History for Plant E</b>					
Weld ID	Description	Date Last Inspected	Percent Coverage Obtained	Number of Recordable Indications	Number of Reportable Indications
E-1	Middle to Lower Shell Circ Weld	1999	93%	0	0
E-2	Middle Shell Longitudinal Weld	1999	100%	2	0
E-3	Middle Shell Longitudinal Weld	1999	100%	0	0
E-4	Middle Shell Longitudinal Weld	1999	100%	1	0
E-5	Lower Shell Longitudinal Weld	1999	95%	1	0
E-6	Lower Shell Longitudinal Weld	1999	100%	0	0
E-7	Lower Shell Longitudinal Weld	1999	100%	0	0

Reactor Vessel ISI Information for Potential Beltline Flaws Plant E																
Weld ID	Indication #	Scan Direction	Weld Centerline (in.) or (°)	Weld Width (in.)	x(in)	θ(°)	2a(in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t(%)	Code Allowable a/t (%)	ASME Code Disposition
E-2	1	Parallel	30°	1.375	217.6	28.8	0.6	0.300	0.95	8.6	0.4	0.3	3.2	3.5	4.1	Allowable
	2	Parallel		1.375	224.7	29.5	0.25	0.125	0.8	8.6	0.8	0.1	10.0	1.2	2.6	2.6
E-4	3	Parallel	270°	1.375	173.9	271.8	0.2	0.100	0.8	8.6	0.5	0.1	10.0	1.2	2.6	Allowable
E-5	4	Parallel	90°	1.375	261.3	88.1	0.2	0.100	0.8	8.6	0.45	0.1	10.0	1.2	2.6	Allowable

Top of core position x=147.15 in.

Bottom of core position x=283.85 in.

Reactor Vessel Inner Diameter (includes cladding)= 172 in.

Cladding Thickness= 0.3125 in.

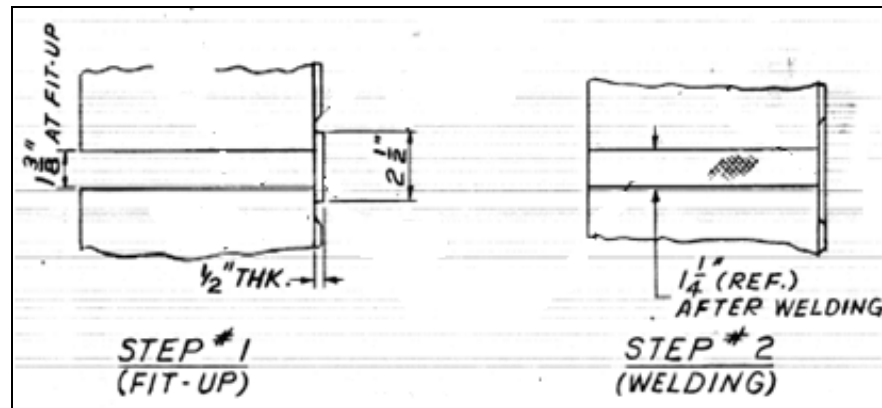


Figure 8: Plant E Circ Weld

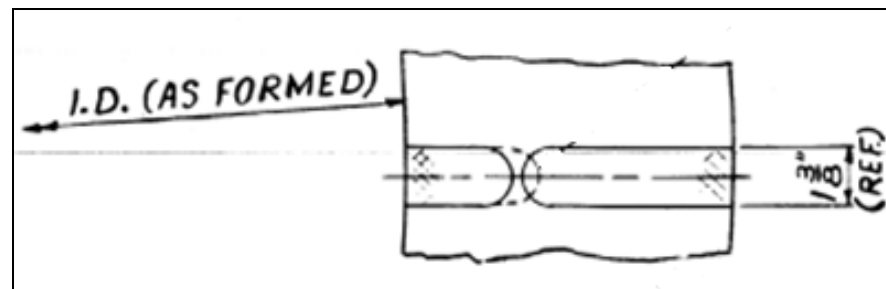


Figure 9: Plant E Axial Weld

**Plant F**

Reactor Vessel ISI History for Plant F Beltline Welds					
ISI Weld ID	Description	Date Last Inspected	Percent Coverage Obtained	Number of Recordable Indications	Number of Reportable Indications
F-1	Nozzle Belt to Upper Shell Circ Weld	2001	100	8	0
F-2	Upper Shell to Lower Shell Circ Weld	2001	100	18	0
F-3	Upper Shell Longitudinal Weld	2001	100	0	0
F-4	Upper Shell Longitudinal Weld	2001	100	0	0
F-5	Lower Shell Longitudinal	2001	79 <sup>1</sup>	0	0
F-6	Lower Shell Longitudinal	2001	79 <sup>1</sup>	0	0
F-7	Shell Course Repair Welds	2001	100	0	0

Note 1: Limited coverage is in the area of the core guide lugs

Reactor Vessel ISI Information for Potential Beltline Flaws Plant F																
Weld Number	Indication #	Beam Direction	Weld Centerline (in.) or (°)	Weld Width (in.)	X(in)	$\theta(^{\circ})^1$	2a (in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
F-1	1	Perp.	162.00 in.	0.75	164.57	111.35	0.34	0.17	85.45	9	3.88 <sup>2</sup>	0.00	Inf.	1.9	2.0	Allowable
	2	Perp.		0.75	163.89	107.34	0.17	0.09	25.33	9	2.30	0.00	Inf.	1.0	2.0	Allowable
	3	Parallel		0.75	165.43	47.91	0.2	0.10	1.36	9	3.83 <sup>2</sup>	0.07	14.3	1.1	2.3	Allowable
	4	Perp.		0.75	164.01	53.66	0.28	0.14	96.07	9	4.07	0.00	Inf.	1.6	2.0	Allowable

Reactor Vessel ISI Information for Potential Beltline Flaws Plant F																
Weld Number	Indication #	Beam Direction	Weld Centerline (in.) or (°)	Weld Width (in.)	X(in)	$\theta(^{\circ})^1$	2a (in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
	5	Perp.		0.75	163.89	159.80	0.54	0.27	1.05	9	3.92 <sup>2</sup>	0.26	3.8	3.1	3.8	Allowable
	6	Perp.		0.75	163.49	152.12	0.35	0.18	30.71	9	4.16 <sup>2</sup>	0.01	100	2.0	2.0	Allowable
	7	Perp.		0.75	161.82	216.13	0.24	0.12	19.13	9	2.86	0.01	100	1.4	2.0	Allowable
	8	Perp.		0.75	162.51	352.92	0.14	0.07	1.59	9	3.90 <sup>2</sup>	0.04	25.0	0.8	2.2	Allowable
F-2	1	Perp.	235.19 in	0.75	Note 3	246.98	0.18	0.09	77.44	9	3.36	0.00	Inf.	1.0	2.0	Allowable
	2	Parallel		0.75	239.55	250.93	0.13	0.07	5.35	9	2.41	0.01	100	0.7	2.0	Allowable
	3	Perp.		0.75	234.23	267.22	0.41	0.21	0.94	9	3.80	0.22	4.5	2.3	3.5	Allowable
	4	Perp.		0.75	228.58	216.54	0.27	0.14	8.2	9	1.69	0.02	50.0	1.5	2.1	Allowable
	5	Perp.		0.75	232.71	307.89	0.27	0.13	89.33	9	3.23 <sup>2</sup>	0.00	Inf.	1.5	2.0	Allowable
	6	Perp.		0.75	239.84	277.87	0.19	0.10	1.24	9	4.04	0.08	12.5	1.1	2.4	Allowable
	7	Perp.		0.75	234.61	312.14	0.23	0.11	69.64	9	4.08	0.00	Inf.	1.3	2.0	Allowable
	8	Perp.		0.75	236.16	360.12	0.21	0.11	78.61	9	4.17	0.00	Inf.	1.2	2.0	Allowable
	9	Perp.		0.75	234.12	355.52	0.17	0.09	60.14	9	3.44 <sup>2</sup>	0.00	Inf.	1.0	2.0	Allowable
	10	Perp.		0.75	235.16	56.32	0.23	0.12	37.45	9	1.46	0.00	Inf.	1.3	2.0	Allowable
	11	Perp.		0.75	235.11	73.21	0.16	0.08	37.47	9	3.60	0.00	Inf.	0.9	2.0	Allowable



Reactor Vessel ISI Information for Potential Beltline Flaws Plant F																
Weld Number	Indication #	Beam Direction	Weld Centerline (in.) or (°)	Weld Width (in.)	X(in)	$\theta(^{\circ})^1$	2a (in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
	12	Parallel		0.75	240.49	75.95	0.19	0.09	3.71	9	0.29 <sup>2</sup>	0.02	50.0	1.0	2.1	Allowable
	13	Perp.		0.75	235.92	73.29	0.14	0.07	5.23	9	0.78	0.01	100	0.8	2.1	Allowable
	14	Perp.		0.75	234.21	113.72	0.16	0.08	107.9	9	1.06 <sup>2</sup>	0.00	Inf.	0.9	2.0	Allowable
	15	Perp.		0.75	234.74	106.32	0.18	0.09	137.9	9	0.52 <sup>2</sup>	0.00	Inf.	1.0	2.0	Allowable
	16	Perp.		0.75	235.91	124.29	0.16	0.08	74.7	9	3.31	0.00	Inf.	0.9	2.0	Allowable
	17	Perp.		0.75	236.19	123.05	0.22	0.11	65.31	9	3.43	0.00	Inf.	1.2	2.0	Allowable
	18	Perp.		0.75	236.20	181.33	0.24	0.12	90.78	9	2.45	0.00	Inf.	1.4	2.0	Allowable

Note 1:  $\theta$  value is for the flaw midpoint.

Note 2: S dimension is measured from the outside diameter surface of the reactor vessel.

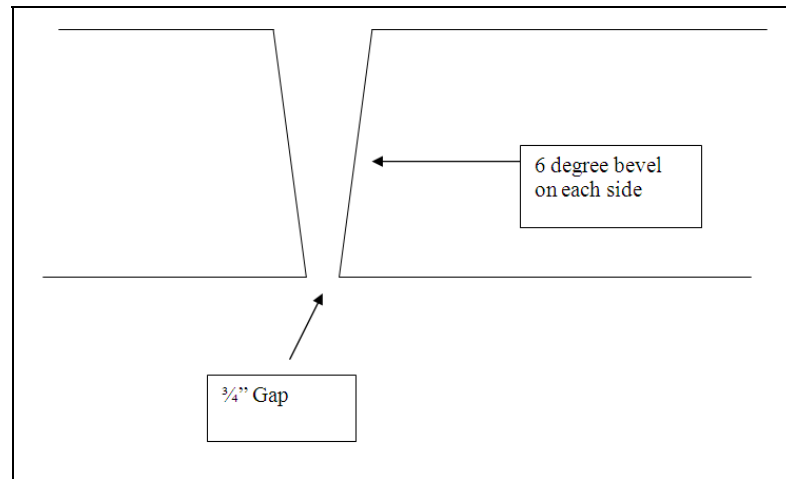
Note 3: Information was not provided in ISI report

Top of core position x=162.75 in.

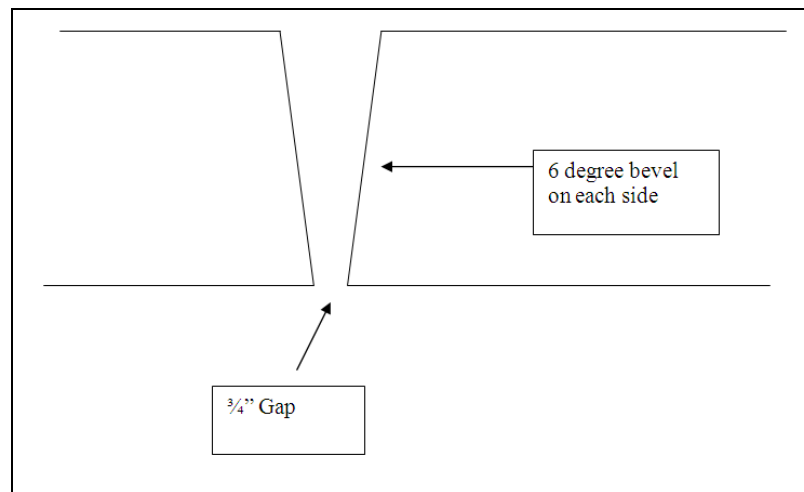
Bottom of core position x=307.63 in.

Reactor Vessel Inner Diameter (without cladding)= 171 in.

Cladding Thickness= 0.188 in.



**Figure 10: Plant F Circ Weld**



**Figure 11: Plant F Axial Weld**

**Plant G**

<b>Reactor Vessel ISI History for Plant G</b>					
<b>Weld ID</b>	<b>Description</b>	<b>Date Last Inspected</b>	<b>Percent Coverage Obtained<sup>1</sup></b>	<b># of Recordable Indications</b>	<b># of Reportable Indications</b>
G-1	Intermediate/Lower Circ	2000	100	2	0
G-2	Lower Head Circ.	2000	75.0	0	0
G-3	Intermediate Long Seam	2000	100	0	0
G-4	Intermediate Long Seam	2000	100	0	0
G-5	Intermediate Long Seam	2000	100	1	0
G-6	Lower Long Seam	2000	100	0	0
G-7	Lower Long Seam	2000	100	0	0
G-8	Lower Long Seam	2000	100	0	0

Reactor Vessel ISI Information for Potential Beltline Flaws Plant G																
Weld ID	Indication #	Scan Direction <sup>1</sup>	Weld Centerline (in.) or (°)	Weld Width (in.)	x(in)	θ(°)	2a(in)	a(in)	L(in)	t(in) <sup>2</sup>	S(in)	a/L	AR	a/t(%)	Code Allowable a/t (%)	ASME Code Disposition
G-1	1	CW	235.06 in.	1.329	229	122.0	0.08	0.04	0.5	9.0	1.0	0.08	12.5	0.05	2.3	Allowable
	2	DN		1.329	234	96.7	0.06	0.03	0.5	9.0	0.18	0.06	16.7	0.03	2.3	Allowable
G-5	1	CCW	240°	1.329	154.7	239.7	0.16	0.08	0.5	9.0	0.77	0.16	6.25	0.9	3.0	Allowable

Note 1: UP= Up, DN=Down, CW=Clockwise, CCW=Counter-Clockwise

Note 2: This is the thickness identified in the ISI Report

Top of core position x=148.07 in.

Bottom of core position x=292.07 in.

Reactor Vessel Inner Diameter (including cladding)= 173 in.

Cladding Thickness= 0.16 in.

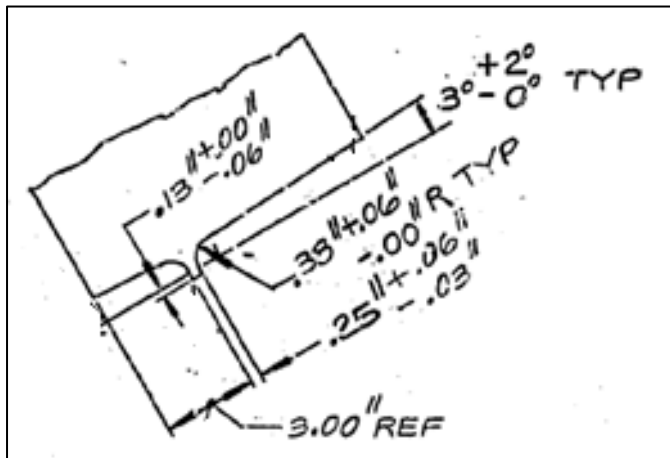


Figure 12: Plant G Axial Weld

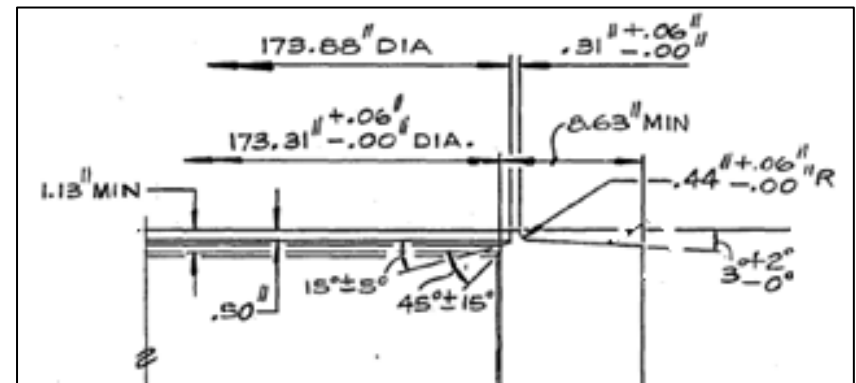


Figure 13: Plant G Circ Weld

## Plant H

Reactor Vessel ISI History for Plant H Beltline Materials				
Weld Inspection No.	Region/Component Description	Date Last Inspected	Number of Recordable Indications	Number of Reportable Flaws
H-1	Lower Shell Long. Weld	2003	1	None
H-2	Lower Shell Long. Weld	2003	No Indications	None
H-3	Lower Shell Long. Weld	2003	No Indications	None
H-4	Lower Shell to Middle Shell Weld	2003	No Indications	None
H-5	Middle Shell Long. Weld	2003	No Indications	None
H-6	Middle Shell Long. Weld	2003	No Indications	None
H-7	Middle Shell Long. Weld	2003	No Indications	None

Reactor Vessel ISI Information for Potential Beltline Flaws Plant H															
Weld Inspection No.	Weld Type (A or C) <sup>(a)</sup>	Weld Width (in.)	Weld Centerline (in.) or (°)	Indication No.	Beam Direction <sup>(a)</sup>	$\theta$ (°)	X (in.)	t <sup>(b)</sup> (in.)	L (in.)	S (in.)	2a (in.)	a/L	a/t (%)	Allowable a/t (%)	ASME Code Disposition
H-1	A	1.38	90°	1	CCW	89.7	261	8.86	1.1	0.57	0.18	0.08	1	2.2	Allowable

(a) A = Axial, C = Circumferential, DN = Down, CW = Clockwise, CCW = Counter-clockwise

(b) Includes cladding thickness of 0.22 in.

Top of core position x=156.36 in.

Bottom of core position x=306.36 in.

Reactor Vessel Inner Diameter (without cladding)= 174.47 in.

Cladding Thickness= 0.21875 in.

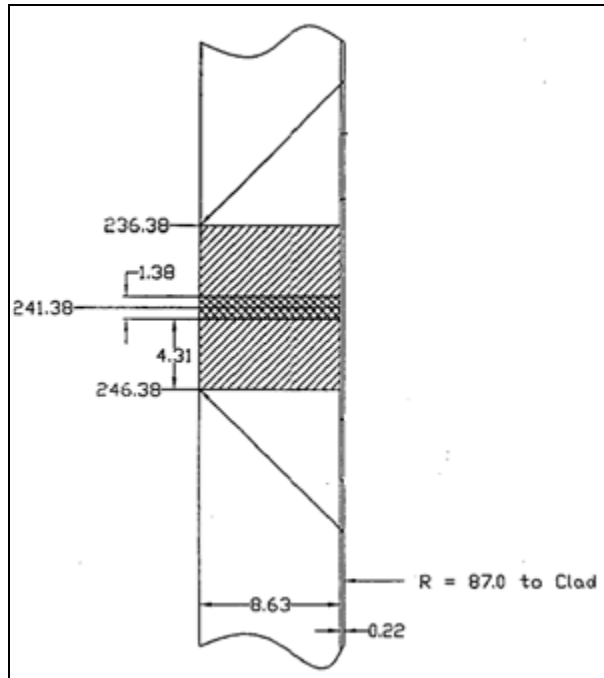


Figure 14: Plant H Circ Weld

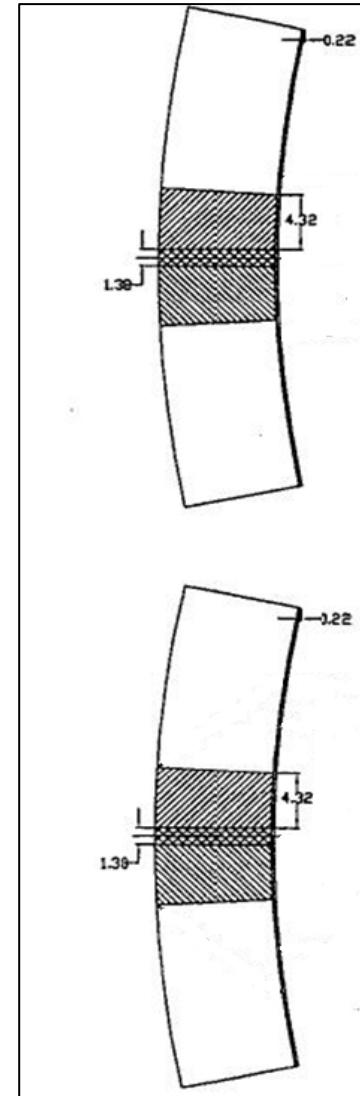


Figure 15: Plant H Axial Weld



**Plant I**

Reactor Vessel ISI History for Plant I Beltline Welds					
Weld ID	Description	Date Last Inspected	Percent Coverage Obtained	Number of Recordable Indications	Number of Reportable Indications
I-1	Intermediate Shell to Lower Shell Circ. Weld	2005	100	1	None
I-2	Nozzle Shell to Intermediate Shell Circ. Weld	2005	100	2	None

Reactor Vessel ISI Information for Potential Beltline Flaws Plant I																
Weld Number	Indication No.	Beam Direction	Weld Centerline (in.) or (°)	Weld width (in)	x(in)	θ(°)	2a (in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
I-1	1	CW	214.89 in.	1.97	212.6	211.7	0.23	0.115	1	8.6	2.4 <sup>1</sup>	0.12	8.3	1.4	2.5	Allowable
I-2	1	CCW	131.11 in.	1.98	131.0	64.6	0.14	0.07	0.5	8.6	0.95	0.14	7.1	0.8	2.5	Allowable
	2	UP		1.98	128.4	291.7	0.32	0.16	1.0	9.5	4.27 <sup>1</sup>	0.16	6.3	1.7	2.9	Allowable

Note 1: S dimension is from outside diameter surface.

Core Position: Vessel intermediate and lower shells are forgings and upper and lower circ. welds are above and below core.

Reactor Vessel Inner Diameter (without cladding)= 173 in.

Cladding Thickness= 0.155 in.

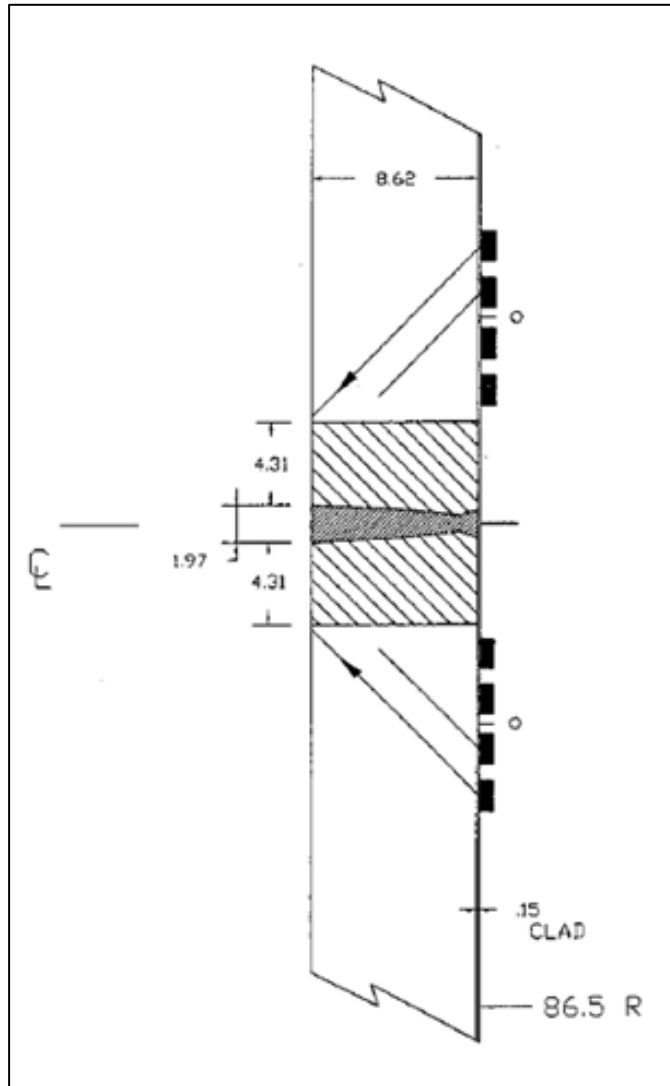


Figure 16: Plant I Intermediate Shell to Lower Shell Circ Weld

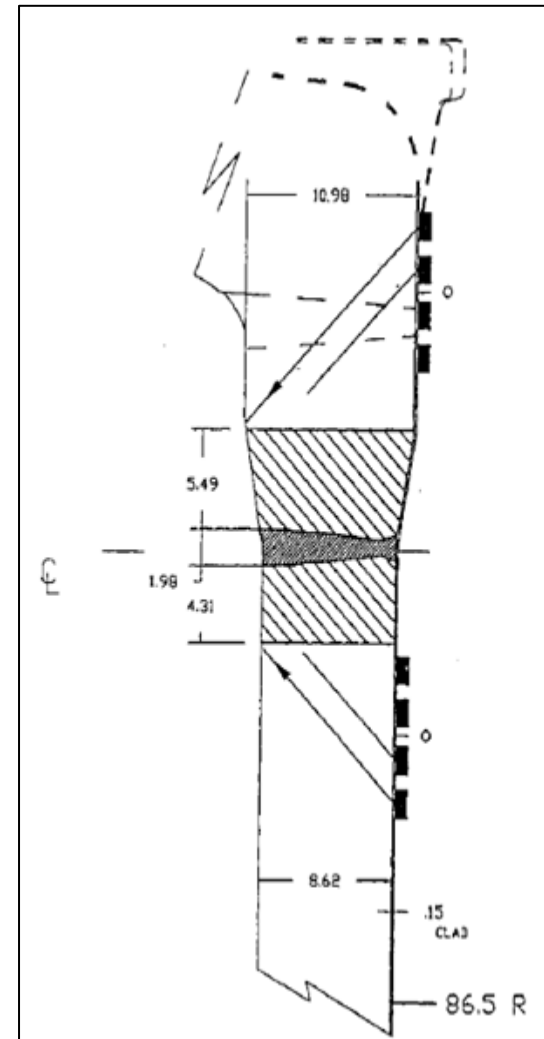


Figure 17: Plant I Nozzle Shell to Lower Shell Circ Weld

**Plant J**

<b>Reactor Vessel ISI History for Plant J Beltline Materials</b>					
<b>Weld ID</b>	<b>Description</b>	<b>Date Last Inspected</b>	<b>Percent Coverage Obtained</b>	<b>Number of Recordable Indications</b>	<b>Number of Reportable Indications</b>
J-1	Nozzle Shell to Intermediate Shell Circ. Weld	2004	100	None	None
J-2	Intermediate Shell to Lower Shell Circ.	2004	100	4	None
J-3	Nozzle Shell Longitudinal Seam	2004	100	None	None
J-4	Nozzle Shell Longitudinal Seam	2004	100	None	None
J-5	Nozzle Shell Longitudinal Seam	2004	100	None	None
J-6	Intermediate Shell Longitudinal Seam	2004	100	None	None
J-7	Intermediate Shell Longitudinal Seam	2004	100	1	None
J-8	Intermediate Shell Longitudinal Seam	2004	100	None	None
J-9	Lower Shell Longitudinal Seam	2004	77.80 <sup>1</sup>	2	None
J-10	Lower Shell Longitudinal Seam	2004	77.80 <sup>1</sup>	None	None
J-11	Lower Shell Longitudinal Seam	2004	77.80 <sup>1</sup>	1	None

Note 1: Limitations exist due to core support lugs at bottom of lower shell longitudinal welds.

Reactor Vessel ISI Information for Potential Beltline Flaws Plant J																
Weld Number	Indication No.	Beam Direction	Weld Centerline (in.) or (°)	Weld width (in)	x (in)	$\theta$ (°)	2a (in)	a (in)	L (in)	t (in)	S (in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
J-2	1	DN	235.00 in.	1.65	235.00	150.1	0.16	0.08	2.10	8.60	1.66	0.04	25.0	0.9	2.0	Allowable
	2	UP		1.65	235.14	157.7	0.12	0.06	1.25	8.60	2.70	0.05	20.0	0.7	2.2	Allowable
	3	UP		1.65	235.80	129.3	N/A	0.25	1.00	8.60	0.00 <sup>1</sup>	.25	4	2.9	3.3	Allowable
	4	UP		1.65	235.50	332.1	0.24	0.12	1.75	8.60	4.49	0.07	14.3	1.4	2.2	Allowable
J-7	1	CCW	120°	1.38	123.6	123.6	0.22	0.11	2.10	8.60	0.63	0.05	20.0	1.3	7.6	Allowable
J-9	1	DN	60°	1.38	256.50	60.3	0.25	0.13	1.60	8.60	0.11	0.08	12.5	1.5	1.87	Allowable
	2	CCW		1.38	240.30	60.4	0.34	0.17	1.60	8.60	0.79	0.11	9.1	2.0	2.5	Allowable
J-11	1	CCW	300°	1.38	312.61	300.3	0.27	0.14	1.75	8.60	3.60	0.08	12.5	1.6	2.2	Allowable

Note 1: S dimension is from outside diameter surface so this is an OD surface flaw.

Top of core position x=149.1 in.

Bottom of core position x=292.6 in.

Reactor Vessel Inner Diameter (without cladding)= 173 in.

Cladding Thickness= 0.156 in.

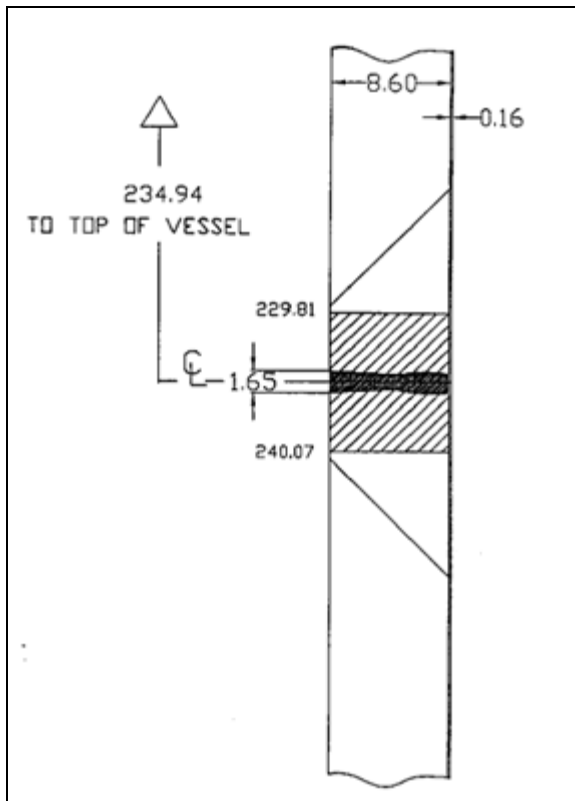


Figure 18: Plant J Circ Weld

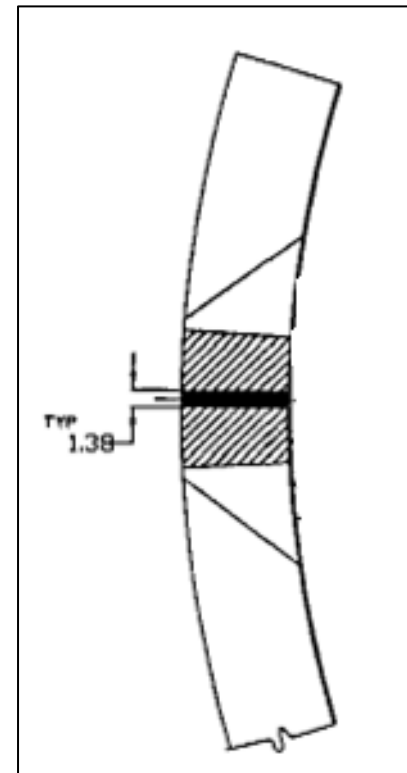


Figure 19: Plant J Axial Weld

**Plant K**

Reactor Vessel ISI History for Plant K Beltline Materials					
Weld ID	Description <sup>1</sup>	Date Last Inspected	Percent Coverage Obtained	Number of Recordable Indications	Number of Reportable Indications
K-1	Nozzle Shell to Intermediate Shell Circ. Weld	2001	100	29	None
K-2	Intermediate Shell to Lower Shell Circ.	2001	100	45	None
K-3	Nozzle Shell Longitudinal Seam °	2001	100	None	None
K-4	Nozzle Shell Longitudinal Seam	2001	91	16	None
K-5	Nozzle Shell Longitudinal Seam	2001	100	3	None
K-6	Intermediate Shell Longitudinal Seam	2001	100	5	None
K-7	Intermediate Shell Longitudinal Seam	2001	100	9	None
K-8	Intermediate Shell Longitudinal Seam	2001	100	3	None
K-9	Lower Shell Longitudinal Seam	2001	79 <sup>1</sup>	3	None
K-10	Lower Shell Longitudinal Seam	2001	79 <sup>1</sup>	6	None
K-11	Lower Shell Longitudinal Seam	2001	79 <sup>1</sup>	None	None

Note 1: Limitations exist due to core support lugs at bottom of lower shell longitudinal welds.

Reactor Vessel ISI Information for Potential Beltline Flaws – Plant K																	
Weld Number	Ind. No.	Ind. Location <sup>1</sup>	Beam Direction	Weld Centerline (in.) or (°)	Weld width (in)	x(in) <sup>2</sup>	θ(°)	2a (in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
K-1	1	Note 1	Perp.	127.25 in.	1.375	Note 3	43.02	0.09	0.05	16.46	9	0.57	0.00	Inf.	0.5	2.0	Allowable
	2	Weld	Perp.		1.375	Note 3	162.97	0.33	0.17	291.81	9	2.90	0.00	Inf.	1.9	2.0	Allowable
	3	Weld	Perp.		1.375	Note 3	189.82	0.16	0.08	522.22	9	1.05	0.00	Inf.	0.9	2.0	Allowable
	4	Weld	Perp.		1.375	Note 3	198.17	0.13	0.07	500.45	9	1.40	0.00	Inf.	0.7	2.0	Allowable
	5	Weld	Perp.		1.375	Note 3	77.19	0.13	0.07	176.17	9	2.62	0.00	Inf.	0.7	2.0	Allowable
	6	Weld	Perp.		1.375	Note 3	192.54	0.15	0.08	514.36	9	1.06	0.00	Inf.	0.9	2.0	Allowable
	7	Weld	Perp.		1.375	Note 3	191.83	0.15	0.08	519.94	9	1.81	0.00	Inf.	0.9	2.0	Allowable
	8	Weld	Perp.		1.375	Note 3	193.29	0.17	0.09	515.43	9	2.43	0.00	Inf.	1.0	2.0	Allowable
	9	Weld	Perp.		1.375	Note 3	131.16	0.08	0.04	288.07	9	2.96	0.00	Inf.	0.5	2.0	Allowable
	10	Weld	Perp.		1.375	Note 3	39.36	0.09	0.05	31.96	9	3.53	0.00	Inf.	0.5	2.0	Allowable
	11	Weld	Perp.		1.375	Note 3	152.00	0.24	0.12	402.82	9	4.01	0.00	Inf.	1.4	2.0	Allowable
	12	Note 1	Perp.		1.375	Note 3	101.06	0.10	0.05	18.07	9	0.48	0.00	Inf.	0.6	2.0	Allowable
	13	Weld	Perp.		1.375	Note 3	214.87	0.14	0.07	449.15	9	2.07	0.00	Inf.	0.8	2.0	Allowable
	14	Weld	Perp.		1.375	Note 3	232.44	0.15	0.08	337.23	9	2.31	0.00	Inf.	0.9	2.0	Allowable
	15	Weld	Perp.		1.375	Note 3	186.83	0.03	0.02	203.31	9	1.18 <sup>5</sup>	0.00	Inf.	0.2	2.0	Allowable
	16	Weld	Perp.		1.375	Note 3	207.38	0.13	0.07	70.73	9	2.4	0.00	Inf.	0.7	2.0	Allowable

Reactor Vessel ISI Information for Potential Beltline Flaws – Plant K																	
Weld Number	Ind. No.	Ind. Location <sup>1</sup>	Beam Direction	Weld Centerline (in.) or (°)	Weld width (in)	x(in) <sup>2</sup>	θ(°)	2a (in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
	17	Weld	Perp.		1.375	Note 3	202.65	0.13	0.07	38.29	9	1.16	0.00	Inf.	0.7	2.0	Allowable
	18	Weld	Perp.		1.375	Note 3	185.98	0.18	0.09	161.14	9	1.58	0.00	Inf.	1.0	2.0	Allowable
	19	Weld	Perp.		1.375	Note 3	196.68	0.17	0.09	202.24	9	1.99	0.00	Inf.	1.0	2.0	Allowable
	20	Weld	Perp.		1.375	Note 3	235.90	0.15	0.08	244.42	9	1.08	0.00	Inf.	0.9	2.0	Allowable
	21	Weld	Perp.		1.375	Note 3	237.74	0.13	0.07	130.62	9	1.64	0.00	Inf.	0.7	2.0	Allowable
	22	Weld	Perp.		1.375	Note 3	138.95	0.16	0.08	173.45	9	2.69	0.00	Inf.	0.9	2.0	Allowable
	23	Weld	Perp.		1.375	Note 3	177.12	0.14	0.07	48.46	9	4.29 <sup>5</sup>	0.00	Inf.	0.8	2.0	Allowable
	24	Weld	Perp.		1.375	Note 3	204.88	0.13	0.07	73.16	9	3.37	0.00	Inf.	0.7	2.0	Allowable
	25	Weld	Perp.		1.375	Note 3	204.26	0.15	0.08	161.94	9	2.29	0.00	Inf.	0.9	2.0	Allowable
	26	Note 1	Perp.		1.375	Note 3	238.08	0.16	0.08	1.10	9	2.54 <sup>5</sup>	0.07	14.29	0.9	2.0	Allowable
	27	Weld	Perp.		1.375	Note 3	269.62	0.08	0.04	63.14	9	3.70 <sup>5</sup>	0.00	Inf.	0.5	2.0	Allowable
	28	Weld	Perp.		1.375	Note 3	265.52	0.19	0.10	61.96	9	1.18 <sup>5</sup>	0.00	Inf.	1.1	2.0	Allowable
29	Note 1	Perp.	1.375	Note 3	271.13	0.19	0.10	62.51 <sup>4</sup>	9	0.14 <sup>5</sup>	0.00 <sup>4</sup>	Inf. <sup>4</sup>	1.1	2.0	Allowable		
K-2	1	Note 1	Perp.	235.84 in.	1.375	Note 3	324.6	0.16	0.08	1.67	9.0	1.10	0.05	20.0	0.9	2.2	Allowable
	2	Note 1	Perp.		1.375	Note 3	61.6	0.27	0.14	1.05	9.0	3.97	0.13	7.7	1.5	2.7	Allowable
	3	Note 1	Perp.		1.375	Note 3	319.7	0.43	0.22	0.38	9.0	0.40	0.56	1.8	2.4	7.6	Allowable
	4	Note 1	Perp.		1.375	Note 3	337.9	0.16	0.08	0.44	9.0	3.3	0.18	5.6	0.9	3.2	Allowable



Reactor Vessel ISI Information for Potential Beltline Flaws – Plant K																	
Weld Number	Ind. No.	Ind. Location <sup>1</sup>	Beam Direction	Weld Centerline (in.) or (°)	Weld width (in)	x(in) <sup>2</sup>	θ(°)	2a (in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
	5	Note 1	Perp.		1.375	Note 3	339.4	0.16	0.08	0.25	9.0	2.15	0.32	3.1	0.9	4.7	Allowable
	6	Note 1	Perp.		1.375	Note 3	191.1	0.12	0.06	3.90	9.0	5.71	0.01	100.0	0.7	2.0	Allowable
	7	Note 1	Perp.		1.375	Note 3	176.4	0.15	0.08	0.87	9.0	3.18	0.09	11.1	0.9	2.5	Allowable
	8	Note 1	Perp.		1.375	Note 3	138.7	0.26	0.13	1.20	9.0	5.41	0.11	9.1	1.5	2.5	Allowable
	9	Weld	Perp.		1.375	Note 3	86.0	0.15	0.08	28.88	9.0	1.35	0.00	Inf.	0.9	2.0	Allowable
	10	Weld	Perp.		1.375	Note 3	104.2	0.35	0.18	0.20	9.0	1.86	0.87	1.1	2	7.6	Allowable
	11	Weld	Perp.		1.375	Note 3	74.6	0.17	0.09	1.01	9.0	1.25	0.08	12.5	1	2.4	Allowable
	12	Weld	Perp.		1.375	Note 3	80.4	0.16	0.08	13.21	9.0	2.42 <sup>5</sup>	0.01	100.0	0.9	2.0	Allowable
	13	Weld	Perp.		1.375	Note 3	79.3	0.30	0.15	13.82	9.0	2.40 <sup>5</sup>	0.01	100.0	1.7	2.0	Allowable
	14	Weld	Perp.		1.375	Note 3	82.6	0.10	0.05	1.33	9.0	0.33 <sup>5</sup>	0.04	25.0	0.6	2.2	Allowable
	15	Weld	Perp.		1.375	Note 3	47.4	0.33	0.17	0.63	9.0	2.99	0.26	3.8	1.9	3.8	Allowable
	16	Weld	Perp.		1.375	Note 3	51.1	0.27	0.13	0.42	9.0	1.74	0.32	3.1	1.5	4.7	Allowable
	17	Weld	Perp.		1.375	Note 3	57.8	0.33	0.16	1.05	9.0	2.66	0.15	6.7	1.9	2.9	Allowable
	18	Weld	Perp.		1.375	Note 3	63.4	0.43	0.22	0.42	9.0	2.66	0.51	2.0	2.4	7.6	Allowable
	19	Weld	Perp.		1.375	Note 3	87.7	0.35	0.18	0.44	9.0	1.33 <sup>5</sup>	0.40	2.5	2	5.8	Allowable
	20	Weld	Perp.		1.375	Note 3	97.5	0.29	0.15	21.46	9.0	1.33 <sup>5</sup>	0.01	100.0	1.7	2	Allowable
	21	Weld	Perp.		1.375	Note 3	105.5	0.32	0.16	0.21	9.0	1.51 <sup>5</sup>	0.75	1.3	1.8	7.6	Allowable

Reactor Vessel ISI Information for Potential Beltline Flaws – Plant K																	
Weld Number	Ind. No.	Ind. Location <sup>1</sup>	Beam Direction	Weld Centerline (in.) or (°)	Weld width (in)	x(in) <sup>2</sup>	θ(°)	2a (in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
	22	Weld	Perp.		1.375	Note 3	96.4	0.14	0.07	1.83	9.0	0.00 <sup>5</sup>	0.08	12.5	1.6	2.1	Allowable
	23	Weld	Perp.		1.375	Note 3	114.2	0.28	0.14	18.65	9.0	2.92 <sup>5</sup>	0.01	100.0	1.6	2.0	Allowable
	24	Weld	Perp.		1.375	Note 3	116.2	0.22	0.11	0.63	9.0	2.30 <sup>5</sup>	0.17	5.9	1.3	3.6	Allowable
	25	Weld	Perp.		1.375	Note 3	132.2	0.17	0.09	0.61	9.0	3.19 <sup>5</sup>	0.14	7.1	1	2.9	Allowable
	26	Weld	Perp.		1.375	Note 3	124.1	0.39	0.20	3.17	9.0	3.85 <sup>5</sup>	0.06	16.7	2.2	2.3	Allowable
	27	Weld	Perp.		1.375	Note 3	88.2	0.09	0.05	0.41	9.0	0.39	0.11	9.1	0.5	2.6	Allowable
	28	Weld	Perp.		1.375	Note 3	125.1	0.12	0.06	0.47	9.0	3.21	0.13	7.7	0.7	3.1	Allowable
	29	Weld	Perp.		1.375	Note 3	113.5	0.25	0.13	7.08	9.0	1.21	0.02	50.0	1.4	2.0	Allowable
	30	Weld	Perp.		1.375	Note 3	127.0	0.07	0.04	0.82	9.0	1.35	0.04	25.0	0.4	2.2	Allowable
	31	Weld	Perp.		1.375	Note 3	209.1	0.15	0.08	38.96	9.0	1.16	0.00	Inf.	0.9	2.0	Allowable
	32	Weld	Perp.		1.375	Note 3	216.3	0.20	0.10	12.65	9.0	1.37	0.01	100.0	1.1	2.0	Allowable
	33	Weld	Parallel		1.375	232.52	Note 3	0.19	0.09	1.80	9.0	4.12	0.05	20.0	1.1	2.2	Allowable
	34	Weld	Parallel		1.375	232.21	Note 3	0.14	0.07	1.99	9.0	2.56 <sup>5</sup>	0.04	25.0	0.8	2.2	Allowable
	35	Weld	Parallel		1.375	232.77	Note 3	0.14	0.07	1.19	9.0	1.79	0.06	16.7	0.8	2.2	Allowable
	36	Weld	Perp.		1.375	Note 3	239.7	0.22	0.11	1.19	9.0	3.70 <sup>5</sup>	0.09	11.1	1.3	2.2	Allowable
	37	Weld	Perp.		1.375	Note 3	231.4	0.26	0.13	1.19	9.0	0.27 <sup>5</sup>	0.11	9.1	1.5	2.5	Allowable
	38	Weld	Perp.		1.375	Note 3	234.1	0.14	0.07	1.19	9.0	0.27 <sup>5</sup>	0.06	16.7	0.8	2.2	Allowable

Reactor Vessel ISI Information for Potential Beltline Flaws – Plant K																	
Weld Number	Ind. No.	Ind. Location <sup>1</sup>	Beam Direction	Weld Centerline (in.) or (°)	Weld width (in)	x(in) <sup>2</sup>	θ(°)	2a (in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
	39	Weld	Perp.		1.375	Note 3	236	0.09	0.05	1.19	9.0	0.33 <sup>5</sup>	0.04	25.0	0.5	2.2	Allowable
	40	Weld	Perp.		1.375	Note 3	235.7	0.16	0.08	1.19	9.0	0.86 <sup>5</sup>	0.07	14.3	0.9	2.3	Allowable
	41	Weld	Perp.		1.375	Note 3	252.6	0.09	0.05	1.19	9.0	0.19 <sup>5</sup>	0.04	25.0	0.5	2.2	Allowable
	42	Weld	Perp.		1.375	Note 3	234.3	0.13	0.07	1.19	9.0	0.90 <sup>5</sup>	0.05	20.0	0.7	2.2	Allowable
	43	Weld	Parallel		1.375	229.53	Note 3	0.31	0.16	0.40	9.0	1.41	0.39	2.6	1.8	5.7	Allowable
	44	Weld	Parallel		1.375	230.61	Note 3	0.36	0.18	2.29	9.0	1.61	0.08	12.5	2.1	2.4	Allowable
	45	Weld	Perp.		1.375	Note 3	263.9	0.13	0.07	1.19	9.0	1.23	0.05	20.0	0.7	2.2	Allowable
K-4	1	Note 1	Perp.	180°	1.375	118.21	Note 3	0.09	0.05	2.16	11.2	2.32	0.02	50.0	0.4	2.0	Allowable
	2	Note 1	Perp.		1.375	115.28	Note 3	0.10	0.05	3.00	11.2	2.31	0.02	50.0	0.5	2.0	Allowable
	3	Note 1	Perp.		1.375	114.28	Note 3	0.20	0.10	2.76	11.2	0.94	0.04	25.0	0.9	2.2	Allowable
	4	Note 1	Perp.		1.375	116.41	Note 3	0.08	0.04	1.55	11.2	2.37	0.03	33.3	0.4	2.1	Allowable
	5	Note 1	Perp.		1.375	119.77	Note 3	0.13	0.06	1.10	11.2	1.04	0.06	16.7	0.6	2.3	Allowable
	6	Note 1	Perp.		1.375	109.51	Note 3	0.33	0.17	23.09	11.2	0.90	0.01	100.0	1.5	2.0	Allowable
	7	Note 1	Perp.		1.375	58.77	Note 3	0.14	0.07	25.33	11.2	1.21	0.00	Inf.	0.6	2.0	Allowable
	8	Note 1	Perp.		1.375	49.16	Note 3	0.35	0.18	15.28	11.2	4.19	0.01	100.0	1.6	2.0	Allowable
	9	Note 1	Parallel		1.375	Note 3	181.21	0.12	0.06	3.80	11.2	4.46	0.02	50.0	0.5	2.1	Allowable
	10	Note 1	Perp.		1.375	60.24	Note 3	0.08	0.04	1.22	11.2	0.16 <sup>5</sup>	0.03	33.3	0.4	2.1	Allowable

Reactor Vessel ISI Information for Potential Beltline Flaws – Plant K																	
Weld Number	Ind. No.	Ind. Location <sup>1</sup>	Beam Direction	Weld Centerline (in.) or (°)	Weld width (in)	x(in) <sup>2</sup>	θ(°)	2a (in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
	11	Note 1	Perp.		1.375	59.64	Note 3	0.19	0.10	0.82	11.2	4.01 <sup>5</sup>	0.12	8.3	0.9	2.7	Allowable
	12	Note 1	Parallel		1.375	Note 3	184.56	0.26	0.13	5.16	11.2	3.91 <sup>5</sup>	0.03	33.3	1.2	2.1	Allowable
	13	Note 1	Parallel		1.375	Note 3	180.0	0.09	0.05	22.39	11.2	4.89	0.00	Inf.	0.4	2.0	Allowable
	14	Note 1	Parallel		1.375	Note 3	180.39	0.23	0.12	5.27	11.2	3.08 <sup>5</sup>	0.02	50.0	1.0	2.1	Allowable
	15	Note 1	Parallel		1.375	Note 3	180.62	0.20	0.10	2.31	11.20	3.88	0.04	25.0	0.9	2.2	Allowable
	16	Note 1	Parallel		1.375	Note 3	182.61	0.28	0.14	1.56	11.2	0.29 <sup>5</sup>	0.09	11.1	1.3	2.5	Allowable
K-5	1	Weld	Perp.	300°	1.375	48.75	Note 3	0.17	0.09	1.70	11	0.55	0.05	20.0	0.8	2.2	Allowable
	2	Weld	Perp.		1.375	56.41	Note 3	0.20	0.10	8.40	11	1.33	0.01	100.0	0.9	2.1	Allowable
	3	Weld	Perp.		1.375	34.22	Note 3	0.07	0.04	3.03	11	1.63	0.01	100.0	0.3	2.0	Allowable
K-6	1	Weld	Perp.	0°	1.375	211.18	Note 3	0.14	0.07	68.07	9.0	1.36	0.00	Inf.	0.8	2.0	Allowable
	2	Weld	Perp.		1.375	137.91	Note 3	0.07	0.04	3.57	9.0	2.02	0.01	100.0	0.4	2.0	Allowable
	3	Weld	Perp.		1.375	138.2	Note 3	0.15	0.08	0.39	9.0	2.92	0.19	5.3	0.9	3.2	Allowable
	4	Weld	Perp.		1.375	187.45	Note 3	0.13	0.07	36.44	9.0	1.59	0.00	Inf.	0.7	2.0	Allowable
	5	Weld	Perp.		1.375	165.89	Note 3	0.14	0.07	19.61	9.0	0.81	0.00	Inf.	0.8	2.0	Allowable
K-7	1	Weld	Perp.	120°	1.375	129.35	Note 3	0.17	0.09	0.82	9.0	1.88	0.10	10.0	1	2.5	Allowable
	2	Weld	Perp.		1.375	187.34	Note 3	0.15	0.08	4.82	9.0	2.12	0.02	50.0	0.9	2.0	Allowable
	3	Weld	Perp.		1.375	146.13	Note 3	0.12	0.06	1.39	9.0	3.88 <sup>5</sup>	0.04	25.0	0.7	2.2	Allowable

Reactor Vessel ISI Information for Potential Beltline Flaws – Plant K																	
Weld Number	Ind. No.	Ind. Location <sup>1</sup>	Beam Direction	Weld Centerline (in.) or (°)	Weld width (in)	x(in) <sup>2</sup>	θ(°)	2a (in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
	4	Weld	Perp.		1.375	169.53	Note 3	0.13	0.07	1.23	9.0	3.83 <sup>5</sup>	0.05	20.0	0.7	2.2	Allowable
	5	Weld	Perp.		1.375	187.11	Note 3	0.10	0.05	0.41	9.0	3.56 <sup>5</sup>	0.12	8.3	0.6	2.7	Allowable
	6	Weld	Perp.		1.375	189.1	Note 3	0.10	0.05	0.60	9.0	3.61 <sup>5</sup>	0.08	12.5	0.6	2.4	Allowable
	7	Weld	Perp.		1.375	231.88	Note 3	0.15	0.078	13.90	9.0	4.32	0.01	100.0	0.9	2.0	Allowable
	8	Weld	Perp.		1.375	231.46	Note 3	0.12	0.06	29.35	9.0	1.67	0.00	Inf.	0.7	2.0	Allowable
	9	Weld	Perp.		1.375	216.53	Note 3	0.15	0.08	1.06	9.0	2.12 <sup>5</sup>	0.07	14.3	0.9	2.3	Allowable
K-8	1	Weld	Perp.		1.375	231.56	Note 3	0.23	0.12	51.01	9.0	1.86	0.00	Inf.	1.3	2.0	Allowable
	2	Weld	Perp.		1.375	219.69	Note 3	0.20	0.10	43.53	9.0	1.39	0.00	Inf.	1.1	2.0	Allowable
	3	Weld	Perp.		1.375	148.3	Note 3	0.22	0.11	0.99	9.0	1.50	0.11	9.1	1.3	2.5	Allowable
K-9	1	Weld	Perp.	60°	1.375	248.92	Note 3	0.27	0.14	58.59	9.0	0.76	0.00	Inf.	1.5	2.0	Allowable
	2	Weld	Perp.		1.375	246.92	Note 3	0.23	0.12	73.14	9.0	2.26	0.00	Inf.	1.3	2.0	Allowable
	3	Weld	Perp.		1.375	242.7	Note 3	0.18	0.09	44.65	9.0	3.55 <sup>5</sup>	0.00	Inf.	1	2.0	Allowable
K-10	1	Weld	Perp.	180°	1.375	241.98	Note 3	0.23	0.12	75.86	9.0	0.30	0.00	Inf.	1.3	2.0	Allowable
	2	Weld	Perp.		1.375	243.83	Note 3	0.12	0.06	60.11	9.0	0.71	0.00	Inf.	0.7	2.0	Allowable
	3	Weld	Perp.		1.375	308.17	Note 3	0.16	0.08	1.31	9.0	4.03 <sup>5</sup>	0.06	16.7	0.9	2.2	Allowable
	4	Weld	Perp.		1.375	245.59	Note 3	0.05	0.03	36.70	9.0	2.32	0.00	Inf.	0.3	2.0	Allowable
	5	Weld	Perp.		1.375	269.2	Note 3	0.12	0.06	25.74	9.0	1.84	0.00	Inf.	0.7	2.0	Allowable

Reactor Vessel ISI Information for Potential Beltline Flaws – Plant K																	
Weld Number	Ind. No.	Ind. Location <sup>1</sup>	Beam Direction	Weld Centerline (in.) or (°)	Weld width (in)	x(in) <sup>2</sup>	θ(°)	2a (in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
	6	Weld	Perp.		1.375	293.84	Note 3	0.11	0.06	0.41	9.0	2.39	0.13	7.7	0.6	2.7	Allowable

Note 1: The Plant K ISI report explicitly indicated in the comment field of the Flaw Evaluation Summary Sheet whether the flaws were in the weld or plate material with the exception of some indications.

Note 2: The ISI report provided “z” positions for the upper and lower extents of the flaws. “z” is equivalent to “x”. Given that “x” is used to determine if the flaw is within the vessel beltline, the following approach was used rather than identifying the mid-point of the flaw or the point with the greatest through-wall extent. For the intermediate shell longitudinal welds, the “x” position indicated in this column is the lower extent (maximum z) position. For the lower shell longitudinal welds, the “x” position indicated in this column is the upper extent (minimum z) position.

Note 3: The ISI report did not provide z/x or θ dimensions for the actual flaw position.

Note 4: This length was incorrectly reported in the ISI report flaw evaluation summary sheet. This error carried over into the calculation of a/L.

Note 5: S dimension is from outside diameter surface. If its value is 0.00, the indication is an OD surface flaw.

Top of core position x= 149.1 in.

Bottom of core position x=292.6 in.

Reactor Vessel Inner Diameter (without cladding)= 173 in.

Cladding Thickness= 0.219 in.

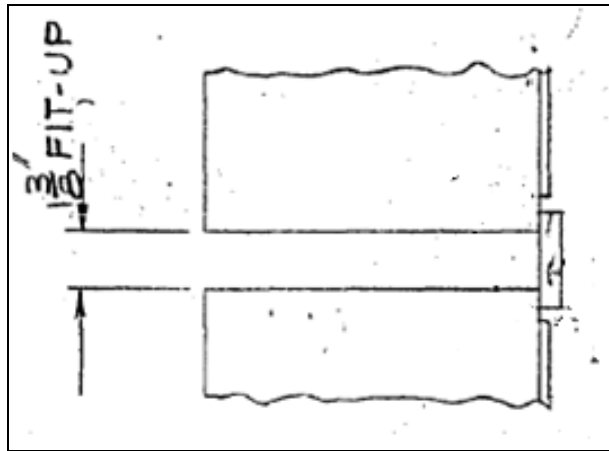


Figure 20: Plant K Circ Weld

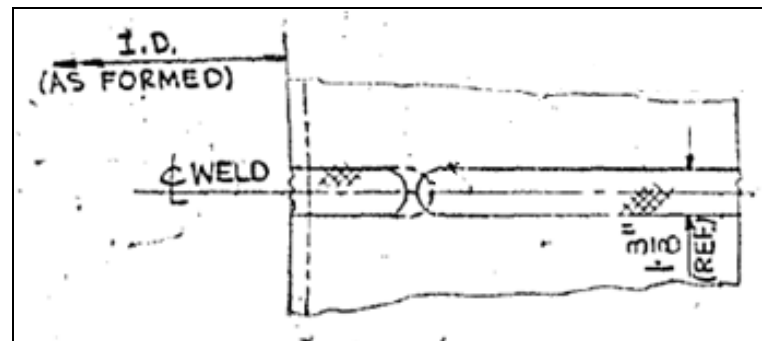


Figure 21: Plant K Axial Weld

**Plant L**

Reactor Vessel ISI History for Plant L					
Weld ID	Description	Date Last Inspected	Percent Coverage Obtained	Number of Recordable Indications	Number of Reportable Indications
L-1	Intermediate Shell to Lower Shell Circ Weld	2005	100	3	None
L-2	Nozzle Shell to Intermediate Shell Circ. Weld	2005	100	None	None

Reactor Vessel ISI Information for Potential Beltline Flaws Plant L																
Weld Number	Indication No.	Beam Direction	Weld Centerline (in.) or (°)	Weld width (in)	x(in)	θ(°)	2a (in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
L-1	1	CW	212.53 in.	1.98	208.8	359	N/A	0.13	1.0	8.47	0.0 <sup>1</sup>	0.13	7.7	1.48	1.8	Allowable
	2	UP		1.98	207.9	264	0.12	0.06	1.5	8.47	0.37 <sup>1</sup>	0.04	25.0	0.71	2.01	Allowable
	3	UP		1.98	209.9	267	0.14	0.07	2.5	8.47	0.47 <sup>1</sup>	0.03	33.3	0.83	1.51	Allowable

Note 1: S dimension is from outside diameter surface so this is an OD surface flaw.

Core Position: Vessel intermediate and lower shells are forgings, and upper and lower circ. welds are above and below core.

Reactor Vessel Inner Diameter (without cladding)= 173 in.

Cladding Thickness= 0.155 in.



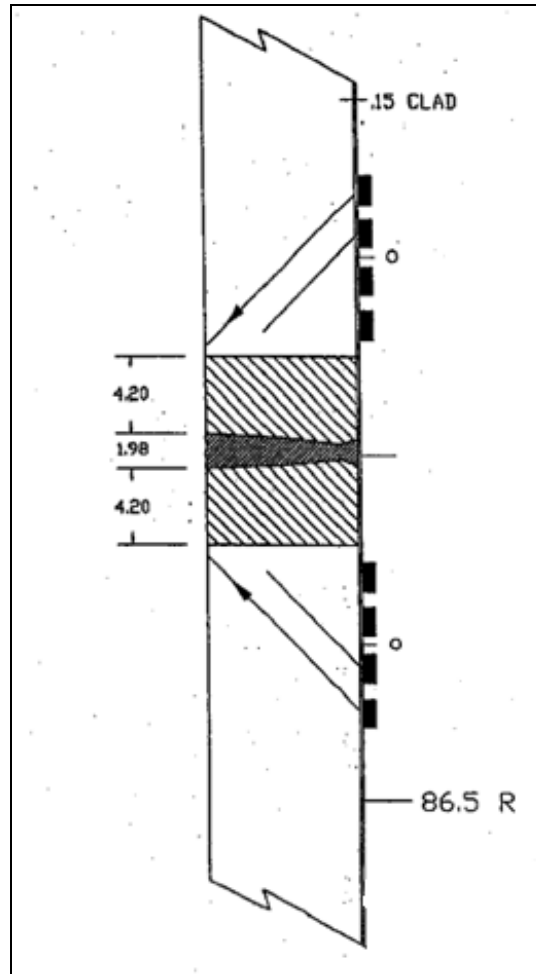


Figure 22: Plant L Circ Weld

**Plant M**

Reactor Vessel ISI History for Plant M Beltline Materials					
Weld ID	Description	Date Last Inspected	Percent Coverage Obtained	Number of Recordable Indications	Number of Reportable Indications
M-1	Intermediate Shell to Lower Shell Circ.	2001	100	1	None
M-2	Intermediate Shell Longitudinal Seam	2001	100	6	None
M-3	Intermediate Shell Longitudinal Seam	2001	100	17	None
M-4	Intermediate Shell Longitudinal Seam	2001	100	20	None
M-5	Lower Shell Longitudinal Seam	2001	91 <sup>1</sup>	0	None
M-6	Lower Shell Longitudinal Seam	2001	91 <sup>1</sup>	10	None
M-7	Lower Shell Longitudinal Seam	2001	91 <sup>1</sup>	0	None

Note 1: Limitations exist due to core support lugs at bottom of lower shell longitudinal welds.

Reactor Vessel ISI Information for Potential Beltline Flaws – Plant M																	
Weld Number	Ind. #	Ind. Location <sup>1</sup>	Beam Direction	Weld Centerline (in.) or (°)	Weld width (in)	x(in) <sup>2</sup>	θ(°)	2a (in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
M-1	1	Weld	Perp.	236.125 in.	1.3125	237.59	104.83	0.22	0.11	0.45	9.3	1.42	0.25	4.0	1.2	3.7	Allowable
M-2	1	Weld	Perp.	300°	1.4375	168.46	299.66	0.09	0.05	1.11	9.3	0.70	0.04	25.0	0.5	2.2	Allowable
	2	Weld	Perp.		1.4375	136.27	299.23	0.12	0.06	0.18	9.3	3.41	0.33	3.0	0.7	4.9	Allowable
	3	Weld	Perp.		1.4375	133.67	299.17	0.16	0.08	0.59	9.3	3.28	0.14	7.1	0.9	2.8	Allowable
	4	Weld	Perp.		1.4375	192.55	298.79	0.08	0.04	0.80	9.3	0.93	0.05	20.0	0.4	2.2	Allowable

Reactor Vessel ISI Information for Potential Beltline Flaws – Plant M																	
Weld Number	Ind. #	Ind. Location <sup>1</sup>	Beam Direction	Weld Centerline (in.) or (°)	Weld width (in)	x(in) <sup>2</sup>	θ(°)	2a (in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
	5	Weld	Perp.		1.4375	195.19	299.00	0.14	0.07	1.61	9.3	1.95	0.04	25.0	0.7	2.2	Allowable
	6	Weld	Perp.		1.4375	195.22	299.16	0.32	0.16	1.02	9.3	1.94	0.16	6.25	1.8	3.0	Allowable
M-3	1	Weld	Perp.	60°	1.4375	210.06	59.41	0.15	0.08	2.02	9.3	3.43	0.04	25.0	0.8	2.1	Allowable
	2	Weld	Perp.		1.4375	222.9	59.50	0.10	0.05	1.27	9.3	3.20	0.04	25.0	0.6	2.2	Allowable
	3	Weld	Perp.		1.4375	228.35	59.35	0.24	0.12	3.50	9.3	3.17	0.03	33.3	1.3	2.1	Allowable
	4	Weld	Perp.		1.4375	167.19	58.78	0.11	0.06	3.03	9.3	3.79	0.02	50.0	0.6	2.1	Allowable
	5	Weld	Perp.		1.4375	159.89	59.06	0.10	0.05	1.00	9.3	1.52	0.05	20.0	0.6	2.2	Allowable
	6	Weld	Perp.		1.4375	146.30	59.97	0.09	0.05	0.62	9.3	2.75	0.07	14.3	0.5	2.3	Allowable
	7	Weld	Perp.		1.4375	148.29	59.94	0.10	0.05	0.41	9.3	2.87	0.12	8.3	0.6	2.7	Allowable
	8	Weld	Perp.		1.4375	150.88	58.14	0.11	0.06	0.42	9.3	3.80	0.13	7.7	0.6	2.7	Allowable
	9	Weld	Perp.		1.4375	155.85	60.04	0.10	0.05	0.78	9.3	2.80	0.06	16.7	0.6	2.3	Allowable
	10	Weld	Perp.		1.4375	157.87	60.00	0.10	0.05	0.20	9.3	2.80	0.25	4.0	0.6	3.8	Allowable
	11	Weld	Perp.		1.4375	168.05	59.36	0.12	0.06	1.20	9.3	3.85 <sup>4</sup>	0.05	20.0	0.7	2.2	Allowable
	12	Weld	Parallel		1.4375	167.44	58.685	0.12	0.06	1.07	9.3	4.36	0.06	16.7	0.7	2.2	Allowable
	13	Weld	Parallel		1.4375	159.52	57.155	0.10	0.05	0.39	9.3	3.57	0.13	7.7	0.6	2.7	Allowable
	14	Weld	Parallel		1.4375	164.96	57.26	0.10	0.05	0.85	9.3	3.18	0.06	16.7	0.6	2.3	Allowable
	15	Weld	Parallel		1.4375	166.84	58.57	0.11	0.06	0.46	9.3	4.32	0.12	8.3	0.6	2.7	Allowable

Reactor Vessel ISI Information for Potential Beltline Flaws – Plant M																	
Weld Number	Ind. #	Ind. Location <sup>1</sup>	Beam Direction	Weld Centerline (in.) or (°)	Weld width (in)	x(in) <sup>2</sup>	θ(°)	2a (in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
	16	Weld	Parallel		1.4375	167.28	58.79	0.09	0.05	0.62	9.3	4.18	0.07	14.3	0.5	2.3	Allowable
	17	Weld	Parallel		1.4375	167.91	56.48	0.14	0.07	0.41	9.3	3.43	0.17	5.9	0.8	3.1	Allowable
M-4	1	Weld	Perp.	180°	1.4375	146.59	178.92	0.15	0.08	0.80	9.3	3.38	0.09	11.1	0.8	2.5	Allowable
	2	Weld	Perp.		1.4375	148.81	178.85	0.11	0.06	1.01	9.3	3.44	0.05	20.0	0.6	2.2	Allowable
	3	Weld	Perp.		1.4375	156.80	Note 3	0.09	0.05	0.62	9.3	2.28	0.07	14.3	0.5	2.3	Allowable
	4	Weld	Perp.		1.4375	157.22	178.95	0.09	0.05	0.25	9.3	1.83	0.18	5.6	0.5	3.1	Allowable
	5	Weld	Perp.		1.4375	157.99	178.92	0.12	0.06	1.02	9.3	1.19	0.06	16.7	0.7	2.3	Allowable
	6	Weld	Perp.		1.4375	161.59	178.78	0.10	0.05	0.20	9.3	1.57	0.25	4.0	0.6	3.8	Allowable
	7	Weld	Perp.		1.4375	154.42	179.21	0.17	0.09	0.62	9.3	1.53 <sup>4</sup>	0.14	7.1	0.9	2.8	Allowable
	8	Weld	Perp.		1.4375	162.43	179.52	0.08	0.04	0.44	9.3	1.93	0.09	11.1	0.4	2.4	Allowable
	9	Weld	Perp.		1.4375	159.19	178.75	0.18	0.09	0.92	9.3	0.14	0.10	10.0	1.0	2.5	Allowable
	10	Weld	Perp.		1.4375	157.85	179.12	0.23	0.11	1.02	9.3	1.25	0.11	9.1	1.2	2.6	Allowable
	11	Weld	Perp.		1.4375	158.72	177.97	0.16	0.08	0.72	9.3	1.17	0.11	9.1	0.9	2.6	Allowable
	12	Weld	Perp.		1.4375	156.74	179.27	0.10	0.05	0.41	9.3	2.83	0.12	8.3	0.6	2.7	Allowable
	13	Weld	Perp.		1.4375	161.53	179.36	0.10	0.05	0.62	9.3	2.41	0.08	12.5	0.6	2.4	Allowable
14	Weld	Perp.	1.4375	170.48	179.19	0.10	0.05	0.40	9.3	1.17	0.13	7.7	0.6	2.7	Allowable		
15	Weld	Perp.	1.4375	180.7	179.51	0.14	0.07	0.58	9.3	1.66 <sup>4</sup>	0.12	8.3	0.8	2.7	Allowable		

Reactor Vessel ISI Information for Potential Beltline Flaws – Plant M																	
Weld Number	Ind. #	Ind. Location <sup>1</sup>	Beam Direction	Weld Centerline (in.) or (°)	Weld width (in)	x(in) <sup>2</sup>	θ(°)	2a (in)	a(in)	L(in)	t(in)	S(in)	a/L	AR	a/t (%)	Code Allowable a/t (%)	ASME Code Disposition
	16	Weld	Perp.		1.4375	162.51	178.15	0.24	0.12	6.01	9.3	0.40 <sup>4</sup>	0.02	50.0	1.3	2.1	Allowable
	17	Weld	Perp.		1.4375	202.93	178.38	0.10	0.05	0.40	9.3	3.15	0.13	7.7	0.6	2.7	Allowable
	18	Weld	Perp.		1.4375	226.87	178.12	0.11	0.06	0.55	9.3	1.81	0.10	10.0	0.6	2.5	Allowable
	19	Weld	Perp.		1.4375	229.53	179.13	0.15	0.08	0.67	9.3	4.27 <sup>4</sup>	0.11	9.1	0.8	2.6	Allowable
	20	Weld	Perp.		1.4375	222.04	179.43	0.08	0.04	1.37	9.3	4.17 <sup>4</sup>	0.03	33.3	0.4	2.1	Allowable
M-6	1	Weld	Perp.	105°	1.4375	242.75	104.97	0.22	0.11	1.00	9.3	0.83	0.11	9.1	1.2	2.6	Allowable
	2	Weld	Perp.		1.4375	247.60	105.00	0.26	0.13	6.82	9.3	0.65	0.02	50.0	1.4	2.1	Allowable
	3	Weld	Perp.		1.4375	244.40	105.17	0.15	0.08	1.02	9.3	0.28	0.07	14.3	0.8	2.3	Allowable
	4	Weld	Perp.		1.4375	297.46	104.93	0.18	0.09	1.24	9.3	0.37	0.07	14.3	1.0	2.3	Allowable
	5	Weld	Perp.		1.4375	241.63	105.38	0.06	0.03	0.18	9.3	1.29	0.17	5.9	0.3	3.0	Allowable
	6	Not Specified	Perp.		1.4375	241.54	105.66	0.19	0.10	56.68	9.3	3.20	0.00	Inf.	1.0	2.0	Allowable
	7	Weld	Perp.		1.4375	309.85	102.62	0.21	0.11	0.82	9.3	2.33 <sup>4</sup>	0.13	7.7	1.2	2.7	Allowable
	8	Weld	Perp.		1.4375	314.65	104.90	0.11	0.06	0.22	9.3	0.49 <sup>4</sup>	0.25	4.0	0.6	3.8	Allowable
	9	Weld	Perp.		1.4375	316.05	104.81	0.15	0.08	0.42	9.3	0.47 <sup>4</sup>	0.18	5.6	0.8	3.1	Allowable
	10	Weld	Perp.		1.4375	316.65	102.35	0.16	0.08	1.01	9.3	2.19 <sup>4</sup>	0.08	12.5	0.9	2.4	Allowable

Note 1: The ISI report indicated in the comment field of the Flaw Evaluation Summary Sheet whether the flaws were in the weld or plate material.

Note 2: The ISI report provided "z" positions for the upper and lower extents of the flaws. "z" is equivalent to "x". Given that "x" is used to determine if the flaw is within the vessel beltline, the following approach was used rather than identifying the mid-point of the flaw or the point with the greatest through-wall extent. For the intermediate shell longitudinal welds, the "x" position indicated in this column is the lower extent (maximum z) position. For the lower shell longitudinal welds, the "x" position indicated in this column is the upper extent (minimum z) position.

Note 3: The ISI report did not provide z/x or  $\theta$  dimensions for the actual flaw position.

Note 4: S dimension is from the outside diameter surface.

Top of core position x=148.125 in.

Bottom of core position x=292.125 in.

Reactor Vessel Inner Diameter (without cladding)= 173.375 in.

Cladding Thickness= 0.21875 in.

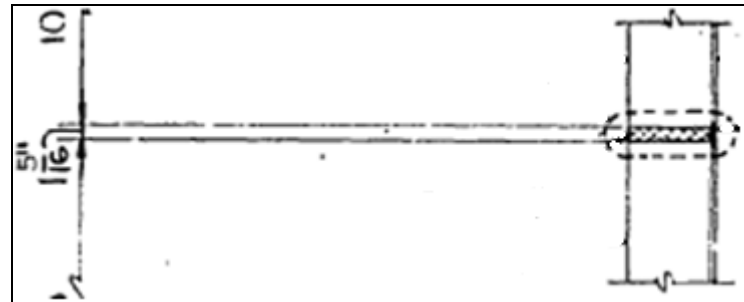


Figure 23: Plant M Circ Weld

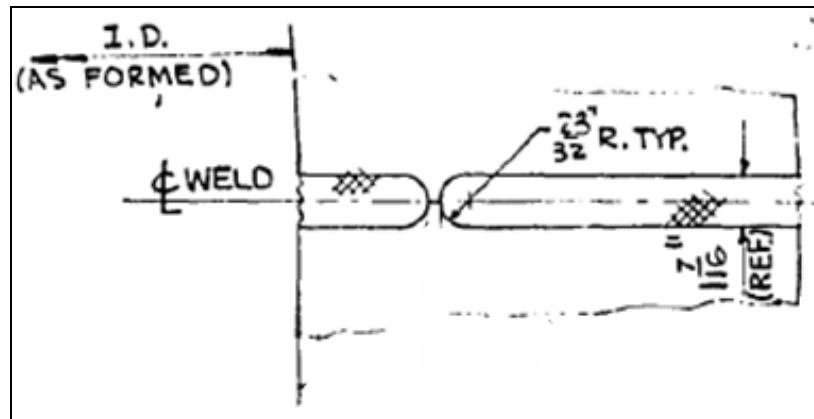


Figure 24: Plant M Axial Weld