

ILLINOIS POWER COMPANY



CLINTON POWER STATION, P.O. BOX 678, CLINTON, ILLINOIS 61727

October 4, 1985

Docket No. 50-461

Director of Nuclear Reactor Regulation
Attn: Mr. W. R. Butler, Chief
Licensing Branch No. 2
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Clinton Power Station, Unit 1
Examination of Corrosion Resistant Cladding
Request for Additional Information
License Condition No. 12

In a letter dated August 28, 1985, the NRC sent a request for additional information related to the examination of corrosion resistant cladding. This letter provides the Illinois Power Company response to the request.

Region III Inspection Report 50-461/85025(DRS) had discussed a demonstration of a special non-destructive examination procedure for the ultrasonic examination of recirculation piping with corrosion resistant cladding (CRC) that was performed by the BWR Owners' Group and witnessed by the NRC Staff. Because the Staff has not established criteria for qualification of procedures and personnel to examine CRC welds in BWR recirculation piping, information related to Clinton Power Station (CPS) specific methodology was requested.

The attachment to this letter provides the information requested in the NRC letter. Please contact us should you have any questions on this matter.

Sincerely yours,

F. A. Spangenberg
Director - Nuclear Licensing
Nuclear Station Engineering

JLP/kaf
Attachment

cc: B. L. Siegel, NRC Clinton Licensing Project Manager
NRC Resident Office
Regional Administrator, Region III, USNRC
Illinois Department of Nuclear Safety

ENCLOS TO: NRR/DE/MTB 1
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EXAMINATION OF CORROSION RESISTANT
CLAD WELDS CLINTON POWER STATION (CPS)
PRESERVICE INSPECTION

The following is in response to NRC's August 28, 1985 request for additional information pertaining to the above topic. The numbered paragraphs relate to those of the request.

1. The identification of CPS Corrosion Resistant Clad (CRC) welds, their dimensions, location and configuration (i.e., Pipe-to-Tee, Pipe-to-Elbow, etc.) are provided in the enclosures.
2. The 1.5-2.5 MHz, pitch-catch, search units used to examine CRC welds are comprised of two .3 in. x .5 in. transducers, arrayed to produce a 45 refracted longitudinal-wave with a 1 in. to .75 in. crossover (focus) depth. It is specifically designed to provide examination coverage of the inner third thickness of the welds. The basic CRC calibration blocks (drawings enclosed) provide clad and unclad areas. The clad portions of the block have CRC thickness typical of that in the recirculation system. On April 24, 1985 at CPS, the examination efficacy was demonstrated to the satisfaction of an NRC Region III inspector, using procedure SwRI-NDT-800-93, Revision 1. Consequently, unresolved item 461/84-35-01 has been closed (Report 50-461/85025 (DRS)). Capability to detect cracks in CRC samples made from 12 inch diameter Hope Creek piping was demonstrated at the EPRI NDE Center in Charlotte on May 16, 1985, and on May 28-29, 1985. Samples included 1/8, 3/16, and 1/4 inch deep cracks. Additionally, Southwest Research Institute (SwRI) examination personnel performed "blind" examinations on CRC samples (22 and 28 inch pipe) at Hope Creek in late July 1985. They were able to detect 3/4 inch long, 10% through-wall cracks using equipment and a procedure (SwRI-NDT-800-100, Rev. 1) essentially the same as those used for Clinton Power Station's preservice inspection.
3. All reflectors, attributable to geometry, are recorded if their signal amplitudes are at least 50% of reference level sensitivity. All other reflectors are recorded, regardless of their signal amplitudes. Indications investigated and found to be other than geometric are reported. To distinguish flaw indications from geometric reflectors, examination personnel rely on a reflector's A-scan location and whether its presentation "travels" or not. A "traveling" indication located at some distance from the weld root is characteristic of a flaw indication. All potential flaw indications are investigated. For CPS, no potential flaw indications have been identified that require investigation.

Enclosures

1. Weld Identification Table
2. Weld Detail Sketch
3. BA Drawing BA-768E444-1, Rev. 2, "Reactor Recirc. A-Loop"
4. BA Drawing BA-768E444-2, Rev. 3, "Reactor Recirc. B-Loop"
5. SwRI Drawing D-4144-616, Rev. B, "16" CRC Pipe Ultra-sonic Calibration Block"
6. SwRI Drawing D-4144-617, Rev. B, "20" CRC Pipe Ultra-sonic Calibration Block"

WELD IDENTIFICATION TABLE
CORROSION RESISTANT CLAD (CRC) REACTOR RECIRCULATION SYSTEM

Weld Identification (1)	Shop Weld	Field Weld	Long Weld	Circumfer. Weld	Configuration (2)	Shop Sheet (3)	End Ident. (3)
Loop "A"							
B33G001A-A-2		x		x	P-P	1-3	1-3
B33G001A-A-2-U	x		x		Pipe	1	1
B33G001A-A-2-D	x		x		Pipe	3	3
G003A-A-1 (W-X)	x			x	P-P	3	4-5
G003A-A-1 (W-X)-U	x		x		Pipe	3	4
G003A-A-1 (W-X)-D	x		x		Pipe	3	5
B33G001A-A-3		x		x	E-V	3-NA	6-NA
B33G001A-A-3-UI	x		x		Elbow	3	6
B33G001A-A-3-UO	x		x		Elbow	3	6
B33G001A-A-4		x		x	V-P	NA-5	NA-11
B33G001A-A-4-D	x		x		Pipe	5	11
B33G001A-A-5		x		x	E-Pump	5-NA	12-NA
B33G001A-A-5-UI	x		x		Elbow	5	12
B33G001A-A-5-UO	x		x		Elbow	5	12
B33G001A-A-6		x		x	Pump-P	NA-7	NA-17
B33G001A-A-6-D	x		x		Pipe	7	17
B33G001A-A-7		x		x	P-V	7-NA	18-NA
B33G001A-A-7-U	x		x		Pipe	7	18
B33G001A-A-8		x		x	V-P	NA-9	NA-21
B33G001A-A-8-D	x		x		Pipe	9	21
B33G001A-A-9		x		x	P-V	9-NA	22-NA
B33G001A-A-9-U	x		x		Pipe	9	22
B33G001A-A-10		x		x	V-P	NA-11	NA-28
B33G001A-A-10-D	x		x		Pipe	11	28

WELD IDENTIFICATION TABLE
CORROSION RESISTANT CLAD (CRC) REACTOR RECIRCULATION SYSTEM

<u>Weld Identification (1)</u>	<u>Shop Weld</u>	<u>Field Weld</u>	<u>Long Weld</u>	<u>Circumfer. Weld</u>	<u>Configuration (2)</u>	<u>Shop Sheet (3)</u>	<u>End Ident. (3)</u>
<u>Loop "A"</u>							
G008-A-1 (W-X)	x			x	E-P	11-11	27-26
G008-A-1 (W-X)-UI	x		x		Elbow	11	27
G008-A-1 (W-X)-D	x		x		Pipe	11	26
B33G001A-A-11		x		x	P-C	11-13	25-37
B33G001A-A-11-U	x		x		Pipe	11	25
G010-A-1 (W-KK)	x			x	C-P	13-13	34-33
G010-A-1 (W-KK)-D	x		x		Pipe	13	33
G010-A-1 (W-LL)	x			x	C-P	13-13	35-36
G010-A-1 (W-LL)-D	x		x		Pipe	13	36
<u>Loop "B"</u>							
B33G001B-B-2		x		x	P-P	2-4	2-7
B33G001B-B-2-U	x		x		Pipe	2	2
B33G001B-B-2-D	x		x		Pipe	4	7
G004-B-1 (W-X)	x			x	P-T	4-4	8-9
G004-B-1 (W-X)-U	x		x		Pipe	4	8
B33G001B-B-3		x		x	E-V	4-NA	10-NA
B33G001B-B-3-UI	x		x		Elbow	4	10
B33G001B-B-3-UO	x		x		Elbow	4	10
B33G001B-B-4		x		x	V-P	NA-6	NA-14
B33G001B-B-4-D	x		x		Pipe	6	14
B33G001B-B-5		x		x	E-Pump	6-NA	15-NA
B33G001B-B-5-UI	x		x		Elbow	6	15
B33G001B-B-5-UO	x		x		Elbow	6	15

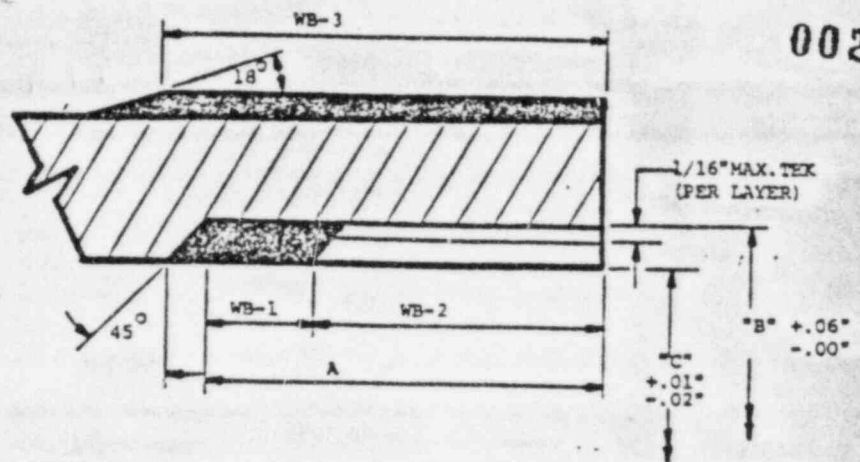
WELD IDENTIFICATION TABLE
CORROSION RESISTANT CLAD (CRC) REACTOR RECIRCULATION SYSTEM

Weld Identification (1)	Shop Weld	Field Weld	Long Weld	Circumfer. Weld	Configuration (2)	Shop Sheet (3)	End Ident. (3)
Loop "B"							
B33G001B-B-6		x		x	Pump-P	NA-8	NA-19
B33G001B-B-6-D	x		x		Pipe	8	19
B33G001B-B-7		x		x	P-V	8-NA	20-NA
B33G001B-B-7-U	x		x		Pipe	8	20
B33G001B-B-8		x		x	V-P	NA-10	NA-23
B33G001B-B-8-D	x		x		Pipe	10	23
B33G001B-B-9		x		x	P-V	10-NA	24-NA
B33G001B-B-9-U	x		x		Pipe	10	24
B33G001B-B-10		x		x	V-P	NA-12	NA-32
B33G001B-B-10-D	x		x		Pipe	12	32
G009-B-1(W-X)	x			x	E-P	12-12	31-30
G009-B-1(W-X)-UI	x		x		Elbow	12	31
G009-B-1(W-X)-D	x		x		Pipe	12	30
B33G001B-B-11		x		x	P-C	12-14	29-43
B33G001B-B-11-U	x		x		Pipe	12	29
G010-B-1(W-KK)	x			x	C-P	14-14	40-39
G010-B-1(W-KK)-D	x		x		Pipe	14	39
G010-B-1(W-LL)	x			x	C-P	14-14	41-42
G010-B-1(W-LL)-D	x		x		Pipe	14	42

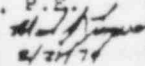
- (1) Shop circumferential welds and adjacent longitudinal welds are prefixed with "B33G001-768E444". Legend for longitudinal welds: D-Downstream, U-Upstream, I-Inner radius, O-Outer radius.
- (2) Configuration for circumferential welds lists the items joined; Upstream item listed first. Legend for items: P-Pipe, V-Valve, E-Elbow, T-Tee, C-Cross.
- (3) "Shop Sheet" and "End Ident." numbers are listed so that the CRC dimensions may be determined when used in conjunction with the "Weld Detail Sketch" attachment. The thickness of CRC on the pipe/fitting exterior is typically 1/8 inch. The CRC thickness on the pipe/fitting interior is approximately 1/4 inch. Valve/pump is NA.

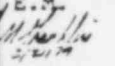
- NOTES:
1. Pipe/fitting diameters are nominally 20-inch except for the last four welds listed in each loop which are 16-inch.
 2. Cladding is applied to inside and outside surfaces.


 JFB
 1-3-80



SHOP SHEET	END IDENT.	ID A	B	WB-1 MIN.	WB-2 MIN.	WB-3 MIN.	"C" FINAL MACH.	
1	CRWB-1	12 $\frac{1}{2}$ "	18.645"	3/4"	1 $\frac{1}{4}$ "	12 $\frac{1}{2}$ "	18.155"	△
2	-2	"	"	"	"	"	"	
3	-3	2-7/16"	"	"	1-11/16"	2-11/16"	"	
	-4	"	"	"	"	"	"	
	-5	"	"	"	"	"	"	△
	-6	1 $\frac{1}{2}$ "	"	1"	1"	1-3/4"	"	
4	-7	2-7/16"	"	3/4"	1-11/16"	2-11/16"	"	
	-8	"	"	"	"	"	"	
	-9	1 $\frac{1}{2}$ "	"	1"	1"	NA	"	
	-10	"	"	"	"	1-3/4"	"	
5	-11	2-7/16"	"	3/4"	1-11/16"	2-11/16"	"	
	-12	1 $\frac{1}{2}$ "	"	1"	1"	1-3/4"	"	△
	-13	1 $\frac{1}{2}$ "	4.359"	1"	1"	1-3/4"	3.869"	
6	-14	2-7/16"	18.645"	3/4"	1-11/16"	2-11/16"	18.155"	
	-15	1 $\frac{1}{2}$ "	"	1"	1"	1-3/4"	"	△
	-16	1 $\frac{1}{2}$ "	4.359"	1"	1"	1-3/4"	3.869"	
7	-17	3 $\frac{1}{4}$ "	18.645"	3/4"	2 $\frac{1}{2}$ "	3 $\frac{1}{4}$ "	18.155"	
	-18	"	"	"	"	"	"	
8	-19	"	"	"	"	"	"	
	-20	"	"	"	"	"	"	
9	-21	7-3/4"	"	"	7"	8"	"	△
	-22	"	"	"	"	"	"	
10	-23	"	"	"	"	"	"	
	-24	"	"	"	"	"	"	
11	-25	3-3/16"	"	"	2-7/16"	3-7/16"	"	
	-26	"	"	"	"	"	"	
	-27	1 $\frac{1}{2}$ "	"	1"	1"	1-3/4"	"	
	-28	3 $\frac{1}{4}$ "	"	3/4"	2 $\frac{1}{2}$ "	3 $\frac{1}{4}$ "	"	
12	-29	3-3/16"	"	"	2-7/16"	3-7/16"	"	
	-30	"	"	"	"	"	"	
	-31	1 $\frac{1}{2}$ "	"	1"	1"	1-3/4"	"	
	-32	3 $\frac{1}{4}$ "	"	3/4"	2 $\frac{1}{2}$ "	3 $\frac{1}{4}$ "	"	
13	-33	2-3/4"	14.974"	"	2"	3"	14.484	
	-34	1 $\frac{1}{2}$ "	"	1"	1"	1-3/4"	"	
	-35	"	"	"	"	"	"	
	-36	2-3/4"	"	3/4"	2"	3"	"	
	-37	1 $\frac{1}{2}$ "	18.645"	1"	1"	NA	18.155"	
	-38	N/A	N/A	N/A	N/A	N/A	N/A	△
14	-39	2-3/4"	14.974"	3/4"	2"	3"	14.484"	
	-40	1 $\frac{1}{2}$ "	"	1"	1"	1-3/4"	"	
	-41	"	"	"	"	"	"	
	-42	2-3/4"	"	3/4"	2"	3"	"	
	-43	1 $\frac{1}{2}$ "	18.645"	1"	1"	NA	18.155"	
	-44	N/A	N/A	N/A	N/A	N/A	N/A	△
4	-45	1 $\frac{1}{2}$ "	16.807	1"	1"	NA	16.317	△/3

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 E.M.

 2/21/78

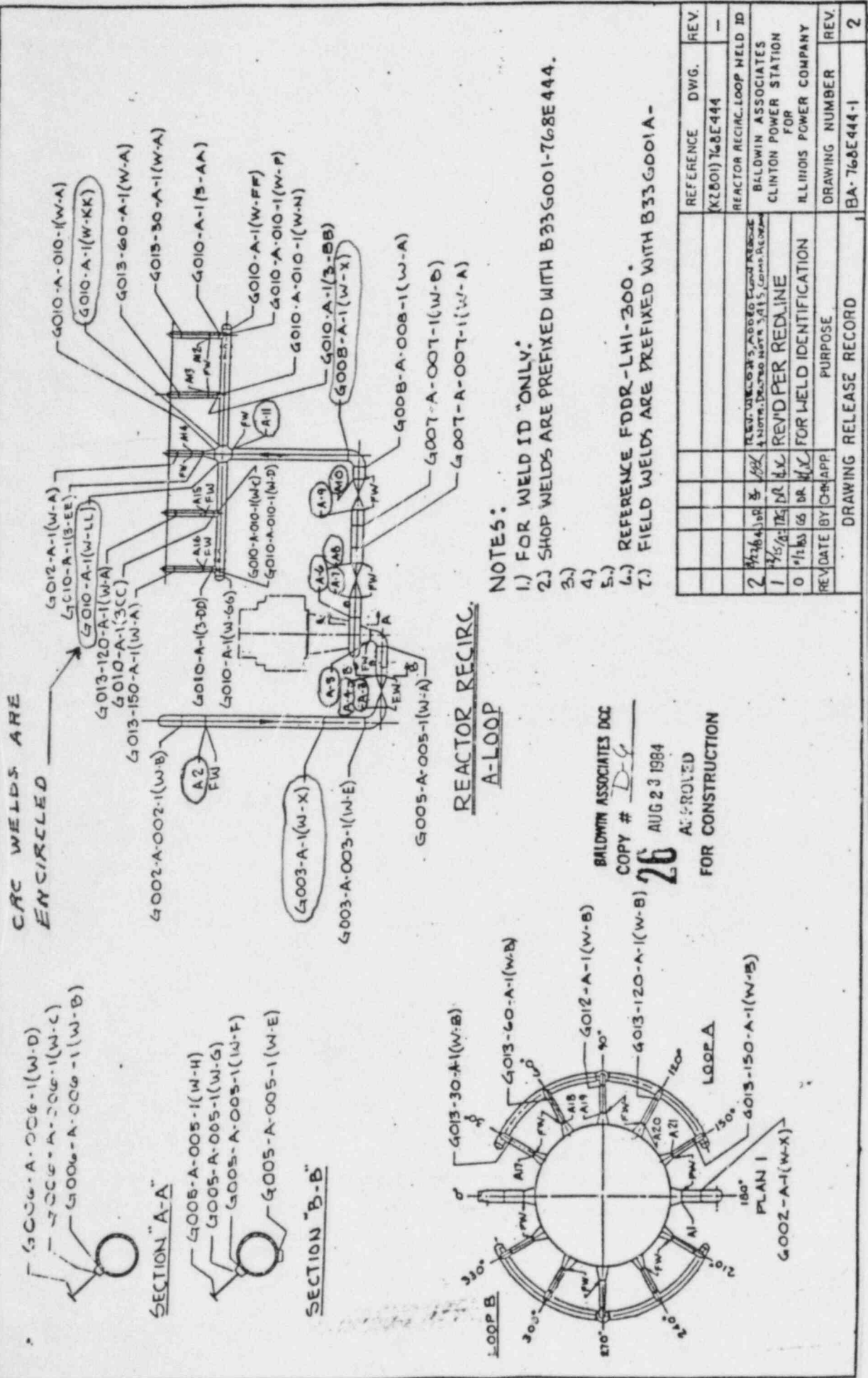
WELD DETAIL SKETCH

SKETCH

20143-1 REV.1

Job #: F-20143-A

REV.2 - DELETED CRWB-38 & 44



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