NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Brunswick Steam Electric Plant Unit 1	0 5 0 0 0 3 2 5	1 OF 0 7

TITLE (4) Pipe Crack Indications Revealed Following Induction Heat Stress Improvement of Unit 1 Reactor Recirculation Piping

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
0 7	0 1	8 5	8 5	0 2 6	0 0	0 7	3 1	8 5		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	5	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
POWER LEVEL (10)	0 1 0 0	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
		20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
		20.405(a)(1)(iv)	X 50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
M. J. Pastva, Jr., Regulatory Technician	AREA CODE 9 1 9 4 5 7 - 2 3 1 5

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	
X	A D	P S X	B 4 5 0	Yes		X	A D	P S X	B 4 5 0	Yes	
X	A D	P S X	B 4 5 0	Yes		X	A D	P S X	B 4 5 0	Yes	

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

During the Unit 1 1985 refuel/maintenance outage, visual and/or ultrasonic examinations of reactor recirculation piping following induction heat stress improvement revealed the existence of 92 indications within the heat-affected zones of 23 of the 79 welds tested. This includes pinhole leaks at five of the welds. 77 of the 92 indications were axial. Additional inspection of the welds using the General Electric automated SMART ultrasonic testing system yielded a positive correlation between the manual and automated inspections made on circumferential indications. The cause of the indications and pinholes is attributed to intergranular stress corrosion cracking (IGSCC) of the class 1, type 304 stainless steel piping material. Corrective action to the indications and pinholes will consist of acceptable weld overlays and in one case, evaluation of acceptability as found. A summary description regarding the identified problems is given in Table 1.

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LICENSEE EVENT REPORT (LER) FAILURE CONTINUATION

U.S. NUCLEAR REGULATORY COMMISSION
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FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6) YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	PAGE (3)
Brunswick Steam Electric Plant Unit 1	0 5 0 0 0 3 2 5	8 5	— 0 2 6 —	0 0	0 2 OF 0 7

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	

NRC Form 366B
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LICENSEE EVENT REPORT (LER) FAILURE CONTINUATION

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COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSY	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes		X	AD	PSX	B450	Yes	
X	AD	PSX	B450	Yes							
X	AD	PSX	B450	Yes							
X	AD	PSX	B450	Yes							
X	AD	PSX	B450	Yes							
X	AD	PSX	B450	Yes							
X	AD	PSX	B450	Yes							
X	AD	PSX	B450	Yes							
X	AD	PSX	B450	Yes							
X	AD	PSX	B450	Yes							
X	AD	PSX	B450	Yes							
X	AD	PSX	B450	Yes							
X	AD	PSX	B450	Yes							
X	AD	PSX	B450	Yes							
X	AD	PSX	B450	Yes							
X	AD	PSX	B450	Yes							

TABLE 1

BRUNSWICK UNIT 1 IGSCC INDICATION SUMMARY

WELD NO.	LOCATION UP OR DOWN	LENGTH	ORIENTATION	SECTION THICKNESS	WELD WIDTH	INDICATION DEPTH % THROUGHWALL	
1-B32-12"-BR-J3	0.35" Downstream	4.00" 24.00"-28.00"	Circumferential	0.67"	1.15"	50-60% TW	N-1
	0.50" Downstream	0.20" 23.40"	Axial	0.67"	1.15"	*	N-1
	0.45" Downstream	0.10" 24.60"	Axial	0.67"	1.15"	*	N-1
	0.45" Downstream	0.10" 26.80"	Axial	0.67"	1.15"	*	N-1
	0.10" Downstream	0.25" 33.00"	Axial	0.67"	1.15"	*	N-1
	0.19" Downstream	0.10" 19.90"	Axial	0.67"	1.15"	*	N-1
1-B32-12"-AR-D3	0.10" Downstream	0.38" 27.50"	Axial	0.71"	1.10"	*	N-1
	0.35" Downstream	0.38" 12.00"	Axial	0.71"	1.10"	*	N-1
1-B32-12"-BR-H3	0.40" Upstream	0.50" 20.80"	Axial	0.65"	1.13"	*	N-1
	0.50" Upstream	0.20" 27.70"	Axial	0.65"	1.13"	*	N-1
1-B32-12"-AR-A2	0.28" Upstream	0.30" 17.75"	Axial	0.66"	1.13"	*	N-1
	0.53" Upstream	0.30" 22.38"	Axial	0.66"	1.13"	*	N-1
	0.05" Upstream	0.40" 27.75"	Axial	0.66"	1.13"	*	N-1
1-B32-12"-BR-K2	0.06" Upstream	~0.06"	Axial	0.64"	1.25"		N-1
1-B32-12"-AR-A3	0.35" Downstream	0.30" 17.25"	Axial	0.63"	1.20"	*	
	0.10" Upstream	0.75" 31.50"	Axial	0.75"	1.20"	*	
	0.30" Upstream	1.75" 34.75"-36.50"	Circumferential	0.75"	1.20"	35%	
1-B32-12"-AR-B3	0.35" Downstream	0.50" 7.00"	Axial	0.63"	1.13"	*	
	0.50" Downstream	0.25" 36.00"	Axial	0.63"	1.13"	*	
1-B32-12"-AR-C2	0.33" Downstream	0.50" 11.00"	Axial	0.77"	1.23"	*	
	0.30" Downstream	0.63" 11.75"	Axial	0.77"	1.23"	*	

*Information cannot be obtained with present weld crown condition.

N-1 Pinhole leaks existed at this weld.

TABLE 1 (Cont'd)

BRUNSWICK UNIT 1 IGSCC INDICATION SUMMARY

WELD NO.	LOCATION UP OR DOWN	LENGTH	ORIENTATION	SECTION THICKNESS	WELD WIDTH	INDICATION DEPTH % THROUGHWALL
	0.25" Downstream	0.75" 13.00"	Axial	0.77"	1.23"	*
	0.38" Downstream	0.63" 13.50"	Axial	0.77"	1.23"	*
	0.25" Downstream	0.63" 12.50"	Axial	0.77"	1.23"	*
	0.50" Downstream	0.50" 14.75"	Axial	0.77"	1.23"	*
	0.70" Downstream	0.30" 15.25"	Axial	0.77"	1.23"	*
	0.70" Downstream	0.30" 16.00"	Axial	0.77"	1.23"	*
	0.70" Downstream	0.30" 16.50"	Axial	0.77"	1.23"	*
	0.50" Downstream	0.25" 18.75"	Axial	0.77"	1.23"	*
	0.63" Downstream	0.33" 18.00"	Axial	0.77"	1.23"	*
	0.45" Downstream	0.38" 19.75"	Axial	0.77"	1.23"	*
	0.30" Downstream	0.60" 18.10"-18.70"	Circumferential	0.77"	1.23"	50%
1-B32-12"-AR-C3	0.55" Downstream	0.40" 11.50"	Axial	0.68"	1.10"	*
	0.28" Downstream	0.35" 9.75"	Axial	0.68"	1.10"	*
	0.28" Downstream	0.30" 29.00"	Axial	0.68"	1.10"	*
1-B32-12"-AR-E3	0.36" Downstream	0.40" 18.25"	Axial	0.68"	1.25"	*
	0.23" Downstream	0.30" 33.75"	Axial	0.68"	1.25"	*
	0.33" Downstream	0.40" 38.75"	Axial	0.68"	1.25"	*
1-B32-12"-BR-K3	0.18" Upstream	0.50" 22.25"	Axial	0.76"	1.10"	*
	0.20" Upstream	0.30" 22.50"	Axial	0.76"	1.10"	*
	0.20" Upstream	0.50" 21.00"	Axial	0.76"	1.10"	*
	0.20" Upstream	0.40" 23.75"	Axial	0.76"	1.10"	*
	0.20" Upstream	0.75" 37.88"	Axial	0.76"	1.10"	*
	0.43" Downstream	0.50" 2.88"	Axial	0.63"	1.10"	*
1-B32-12"-BR-G4	0.73" Upstream	0.30" 34.00"	Axial	0.74"	1.20"	*

*Information cannot be obtained with present weld crown condition.

TABLE 1 (Cont'd)

BRUNSWICK UNIT 1 IGSCC INDICATION SUMMARY

WELD NO.	LOCATION UP OR DOWN	LENGTH	ORIENTATION	SECTION THICKNESS	WELD WIDTH	INDICATION DEPTH % THROUGHWALL
	0.60" Upstream	0.50" 32.75"	Axial	0.74"	1.20"	*
1-B32-12"-BR-K4	0.86" Upstream	0.40" 34.25"	Axial	0.74"	1.10"	*
	0.95" Upstream	0.40" 3.75"	Axial	0.74"	1.10"	*
1-B32-12"-AR-D4	0.15" Upstream	2.00" 26.00"-28.00"	Circumferential	0.66"	1.25"	35%
	0.10" Upstream	0.30" 26.63"	Axial	0.66"	1.25"	*
	0.33" Upstream	0.20" 36.00"	Axial	0.66"	1.25"	*
	0.33" Upstream	0.10" 37.75"	Axial	0.66"	1.25"	*
	0.33" Upstream	0.60" 38.25"	Axial	0.66"	1.25"	
	0.28" Upstream	0.30" 38.50"	Axial	0.66"	1.25"	*
1-B32-12"-BR-F2	0.20" Downstream	0.75" 38.50"	Axial	0.79"	1.38"	*
1-B32-12"-BR-J2	0.23" Upstream	0.30" 15.50"	Axial	0.67"	0.90"	*
	0.00" Upstream	0.30" 17.00"	Axial	0.67"	0.90"	*
	0.00" Upstream	0.50" 19.75"	Axial	0.67"	0.90"	*
	0.00" Upstream	0.25" 19.25"	Axial	0.67"	0.90"	*
	0.00" Upstream	0.50" 27.50"	Axial	0.67"	0.90"	*
	0.30" Downstream	0.30" 21.25"	Axial	0.77"	0.90"	*
	0.20" Upstream	0.50" 31.25"	Axial	0.67"	0.90"	*
	0.53" Upstream	0.13" 33.25"	Axial	0.67"	0.90"	*
	0.45" Upstream	0.30" 37.50"	Axial	0.67"	0.90"	*
	0.28" Upstream	0.60" 38.00"	Axial	0.67"	0.90"	*
1-B32-12"-BR-G3	0.00" Upstream	0.80" 15.00"	Axial	0.72"	1.10"	*
	0.15" Upstream	0.30" 21.00"	Axial	0.63"	1.10"	*
1-B32-12"-BR-G2	0.10" Downstream	0.60" 8.50"	Axial	0.65"	1.00"	*
	0.13" Upstream	0.30" 19.25"	Axial	0.65"	1.00"	*

*Information cannot be obtained with present weld crown condition.

TABLE 1 (Cont'd)

BRUNSWICK UNIT 1 IGSCC INDICATION SUMMARY

WELD NO.	LOCATION UP OR DOWN	LENGTH	ORIENTATION	SECTION THICKNESS	WELD WIDTH	INDICATION DEPTH % THROUGHWALL
	0.10" Upstream	0.50" 21.00"	Axial	0.65"	1.00"	*
	0.10" Upstream	0.85" 25.75"	Axial	0.65"	1.00"	*
	0.50" Upstream	1.13" 20.63"-21.75"	Circumferential	0.65"	1.00"	25%
1-B32-12"-AR-D2	0.13" Upstream	0.60" 10.75"	Axial	0.65"	1.25"	*
1-B32-12"-BR-H2	0.15" Downstream	0.40" 28.50"	Axial	0.75"	1.00"	*
1-B32-28"-A-4	0.45" Upstream	0.50" 9.25-9.75"	Circumferential	1.25"	1.60"	30%
	0.11" Upstream	0.75" 11.00-11.75"	Circumferential	1.25"	1.60"	20-30%
	0.50" Upstream	1.25" 75.50-76.75"	Circumferential	1.25"	1.60"	20-30%
	0.80" Upstream	1.00" 81.25-82.25"	Circumferential	1.25"	1.60"	20-30%
	0.80" Upstream	1.00" 85.25-86.25"	Circumferential	1.25"	1.60"	20-30%
	0.40" Upstream	0.40" 8.70"	Axial	1.25"	1.60"	*
	0.60" Upstream	0.40" 9.10"	Axial	1.25"	1.60"	*
	0.40" Upstream	0.40" 9.65"	Axial	1.25"	1.60"	*
	0.30" Upstream	0.50" 7.35"	Axial	1.25"	1.60"	*
	0.55" Upstream	0.40" 11.85"	Axial	1.25"	1.60"	*
	0.71" Upstream	0.30" 73.75"	Axial	1.25"	1.60"	*
	0.80" Upstream	0.20" 74.75"	Axial	1.25"	1.60"	*
	0.60" Upstream	0.60" 81.50"	Axial	1.25"	1.60"	*
1-B32-28"-B-4	0.35" Downstream	0.63" 75.75-76.38"	Circumferential	1.20"	1.50"	30%
	0.35" Downstream	1.25" 78.50-79.75"	Circumferential	1.20"	1.50"	20%
	0.30" Downstream	0.50" 81.75-82.25"	Circumferential	1.20"	1.50"	20%
	0.25" Downstream	2.25" 4.50-6.75"	Circumferential	1.20"	1.50"	< 15%
	0.40" Upstream	0.40" 80.75"	Axial	1.35"	1.50"	*
1-B32-28"-A-8	0.55" Upstream	2.25" 67.00-69.25"	Circumferential	1.30"	1.80"	20%

*Information cannot be obtained with present weld crown condition.