CP&L

Carolina Power & Light Company
PO Box 10429
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JUL 0 3 1997

SERIAL: BSEP 97-0292

U. S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 1
DOCKET NO. 50-325/LICENSE NO. DPR-71
ASME BOILER AND PRESSURE VESSEL CODE, SECTION XI
IN-SERVICE INSPECTION PROGRAM RELIEF REQUEST
SERVICE WATER PIPING NON-CODE REPAIR

Gentlemen:

The purpose of this letter is to request relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, in accordance with 10 CFR 50.55a(g)(6)(i), and NRC Generic Letter 90-05, "Guidance For Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping," for the Brunswick Steam Electric Plant, Unit No. 1. The request for relief applies to two through-wall leaks identified on the Service Water system vital header immediately downstream of valve 1-SW-V132. The detailed request for relief is provided in Enclosure 1. A list of regulatory commitments contained in this letter is provided in Enclosure 2.

Please refer any questions regarding this submittal to Mr. Mark Turkal, Supervisor - Licensing at (910) 457-3066.

Sincerely,

Keith R. Jury

Keith R. Jury
Manager - Regulatory Affairs
Brunswick Steam Electric Plant

A047 1/1

WRM/wrm

Enclosures
1. Relief Request
2. List of Regulatory Commitments

pc (with enclosures):

U. S. Nuclear Regulatory Commission, Region II
ATTN.: Mr. Luis A. Reyes, Regional Administrator
Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, GA 30303

U. S. Nuclear Regulatory Commission
ATTN: Mr. C. A. Patterson, NRC Senior Resident Inspector
8470 River Road
Southport, NC 28461

U. S. Nuclear Regulatory Commission
ATTN.: Mr. David C. Trimble, Jr. (Mail Stop OWFN 14H22)
11555 Rockville Pike
Rockville, MD 20852-2738

The Honorable J. A. Sanford
Chairman - North Carolina Utilities Commission
P.O. Box 29510
Raleigh, NC 27626-0510

Division of Boiler and Pressure Vessel
North Carolina Department of Labor
ATTN: Mr. Jack Given, Assistant Director of Boiler & Pressure Vessels
4 West Edenton Street
Raleigh, NC 27601-1092

ENCLOSURE 1

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 1
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Unit:	1
Component:	Service Water system Vital Header (Line Number 1-SW-133-6-157)
System:	Service Water
Class:	3
Impractical Code Requirement:	The American Society of Mechanical Engineers (ASME) Code, Section XI, 1980 Edition through the 1981 Addenda, paragraph IWA-4000 states: "Repairs shall be performed in accordance with the Owner's Design Specification and Construction Code of the component or system."
Proposed Alternative:	Perform a temporary non-code repair on the first weld downstream of valve 1-SW-V132 in accordance with NRC Generic Letter 90-05 until the next scheduled outage exceeding thirty days (but no later than the next scheduled refueling outage).
Basis For The Proposed Alternative:	On June 5, 1997, a through-wall leak was identified on the Unit 1 Service Water system vital header immediately downstream of valve 1-SW-V132 (line number 1-SW-133-6-157). Subsequently, on June 14, 1997, another through-wall leak was identified approximately three (3) inches from the leak identified on June 5, 1997. Line number 1-SW-133-6-157 is part of a moderate energy system and is classified as ASME Class 3. Completion of a code repair of the flaws would require isolation of the nuclear Service Water header and shut down of the unit; therefore, code repair of the flaws during plant operation is impractical.

In accordance with the guidance of NRC Generic Letter 90-05, the 6-inch pipe has been examined by the ultrasonic examination (UT) method. However, the specific location and characterization of the flaws could not be determined using UT examination methods. Both defects have been characterized as "pin-hole" type leaks. UT measurements indicate that the pipe wall thickness within 1 inch of the leaks is consistently in the range of 0.1 inch. None of the UT readings are below the minimum wall thickness value. The UT data indicates that there are two additional locations along the same weld that are suspect.

The nominal wall thickness of 6-inch schedule 40 pipe is 0.280 inches. For a 6-inch nominal diameter carbon steel pipe, the minimum wall thickness is computed by:

t_{min} = $PD/2(S_e + P_y)$
= $(150 \times 6.625) / 2 (15000 + 150(0.4))$
= 0.033 inches

Since the flaws can not be specifically characterized, evaluation in accordance with the methods of Generic Letter 90-05 (e.g., the "through-wall" approach and the "wall thinning" approach) is not appropriate. However, CP&L has performed an evaluation of the flaw area using a gross pipe section approach in conjunction with the lowest expected wall thickness (0.06 inch) at the next refueling outage. This analysis supports the determination that the flaw area is acceptable for continued operation until Refuel Outage 11 for Unit 1, currently scheduled to begin in May of 1998.

In addition to the evaluation, augmented inspections using the UT method of five (5) susceptible and accessible locations were performed. The results of these examinations were evaluated and found to be acceptable as no other flaws were identified.

As stipulated by Generic Letter 90-05, until the code repair is completed, the integrity of the flawed area will be assessed at least every 3 months using a nondestructive examination technique. In addition, as stipulated by the Generic Letter, a qualitative assessment of leakage through the

flawed area will be performed at least every week to determine any degradation of structural integrity until the code repair is completed.

In conclusion, the overall degradation of the affected portion of the Service Water system has been assessed and evaluated as acceptable.

ATTACHMENT A

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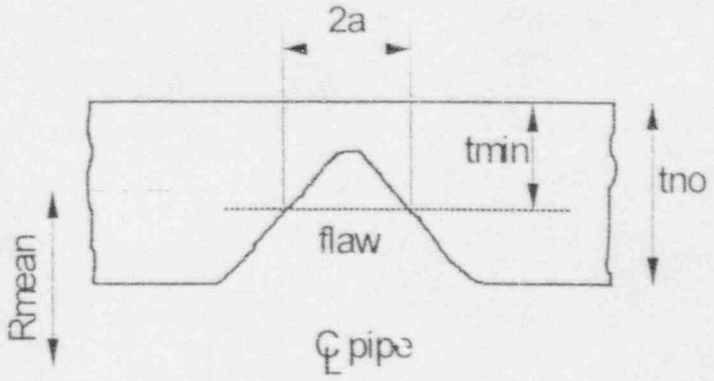
THROUGH-WALL FLAW EVALUATION
FOR SERVICE WATER SYSTEM LINE 1-SW-133-6-157

Generic Letter 90-05 - Enclosure 1 (Section 3.c.a) - "Through Wall Flaw Approach"

	tmin	.3tnom	
Design Press (psig) =	150	150	Enter design pressure for component under evaluation
Matrl =	CS	CS	Enter either SS for stainless or CS for carbon (not applicable for CR-MO or CU-NI)
Sh (psi) =	15000	15000	Allowable stress of component material
O.D. (in) =	6.625	6.625	O.D. = outside diameter of pipe
tnom (in) =	0.28	0.28	tnom= nominal pipe wall thickness of the piping
S (psi) =	3250	3250	S= combined bending stresses (DW+SLP+Thermal+Seismic) (SSE)
Flaw Size 2a (in) =	0.5	0.5	2a - entry required only if flaw size known - if no entry then maximum flaw size is assumed (max 2a)
tp =			predicted wall thickness at next inspection - if entry is made, then this is used as tmin or .3tnom
max 2a (in) =	3.000	3.000	2a= length of the flaw which is less than tmin NOTE: 2a can not exceed 3in or 15% of circumference of pipe.
15%circum (in) =	3.122	3.122	
Rmean (in) =	3.173	3.173	Rmean = OD-tnom/2
a (in) =	0.250	0.250	a= 2a/2
tmin | .3tnom (in) =	0.033	0.084	tmin= minimum pipe wall required for internal pressure (Note: GL90-05 assumes entire section at this thickness)
r (in) =	96.157	37.768	r =Rmean/tmin
c=	0.025	0.025	c= a/(3.1416*Rmean)
A=	894.971	36.996	A=-3.26543 + 1.52784*r -0.072698*r^2 + 0.0016011*r^3
B=	-2287.791	-91.705	B=11.36322 - 3.91412*r + 0.18619*r^2 - 0.004099*r^3
C=	2257.354	98.147	C=-3.18609 + 3.84763*r - 0.18304*r^2 + 0.00403*r^3
F=	4.333	1.138	F= 1+ A*c^1.5 + B*c^2.5 + C*c^3.5
K (ksi in^.5) =	17.472	4.589	K= 1.4*S*F*(3.1416*a)^0.5



COMMENTS

Since the through wall flaw is too small to detect with the instrumentation available, it will be conservatively assumed to be .5" (2a).

The wear rate is estimated to be 0.02" per year based on the NDE reading taken in 93. The min wall reading of 0.077" to through wall occured in 4 years.

The predicted flaw area at the time of the spring '98 outage B112R1 will not be greater that the above assumed 0.5". Therefore this flaw is acceptable till B112R1.

CONCLUSION

tmin	Since	17	<=	35 ksi (in)^.5	OK
tmin	Since	2a	<= 3in & 15% of pipe circumference - OK		
0.3tnom	Since	5	<=	35 ksi (in)^.5	OK
0.3tnom	Since	2a	<= 3in &15% of pipe circumference - OK		

Prepared By: [signature] Date: 6.6.97

Verified By: [signature] Date: 6/6/97

MARTIN E. SATHER

Method: [x] Design Review [ ] Alternate Calculation [ ] Qual Testing

08/29/95

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ENCLOSURE 2

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LIST OF REGULATORY COMMITMENTS

The following table identifies those actions committed to by Carolina Power & Light (CP&L) Company in this document. Any other actions discussed in the submittal represent intended or planned actions by CP&L. They are described to the NRC for the NRC's information and are not regulatory commitments. Please notify the Manager - Regulatory Affairs at the Brunswick Steam Electric Plant of any questions regarding this document or any associated regulatory commitments.

	Commitment	Committed date or outage
1.	Assess the integrity of the flawed area located on line number 1-SW-133-6-157 immediately downstream of valve 1-SW-V132, in accordance with Generic Letter 90-05, using a nondestructive examination technique.	At least every 3 months until completion of a code repair.
2.	Perform a qualitative assessment of leakage through the flawed area located on line number 1-SW-133-6-157 immediately downstream of valve 1-SW-V132, in accordance with Generic Letter 90-05, to determine any degradation of structural integrity.	At least every week until completion of a code repair.
3.	Perform a repair in accordance with the ASME Code, Section XI of the flawed area of line number 1-SW-133-6-157 immediately downstream of valve 1-SW-V132.	Next scheduled outage exceeding 30 days duration or B113R1.