CP&L
Carolina Power & Light Company

SERIAL: NLS-84-055

FEB 10 1984

Director of Nuclear Reactor Regulation
Attention: Mr. D. B. Vassallo, Chief
Operating Reactors Branch No. 2
Division of Licensing
United States Nuclear Regulatory Commission
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-324
LICENSE NO. DPR-62
UNIT 2 IGSCC INSPECTIONS

Dear Mr. Vassallo:

In a letter dated November 28, 1983, Carolina Power & Light Company (CP&L) committed to submit the final design report on the fracture mechanics evaluations and weld overlay repairs performed at Brunswick Steam Electric Plant, Unit No. 2 (BSEP2). In addition, your staff has requested a listing of significant geometry indications and their disposition.

Enclosed is the final design report prepared for CP&L by NUTECH Engineers. This report contains details of the fracture mechanics analyses, weld overlay designs and evaluations of shrinkage stresses due to weld overlays. In addition to the NUTECH report, Attachment 1 lists the significant geometry indications and their disposition.

The Commission issued an order for BSEP, Unit 2 concerning IGSCC inspection. Paragraph III.2.c states the following:

> Plans for inspections, corrective actions, and/or modification, including replacement of the recirculation and/or coolant pressure boundary piping systems, during the next outage which is scheduled to begin in March 1984 but which may begin as late as April 30, 1984 shall be submitted at least 30 days before the startup of that outage.

In compliance with the above paragraph, during the refueling outage scheduled for March 1984, CP&L plans to re-inspect the weld joints that contained IGSCC indications and were not repaired during the November 1983 inspection. Based on the results of those inspections, the joints will be either repaired or an analysis will be done to justify continued operation without repair. Because of the short period of operation between the inspection outage performed in November 1983 and the refueling outage scheduled for March 1984 (4 months), we do not plan to re-inspect the weld joints that did not have IGSCC indications or those weld joints that were repaired.

A001
1/1

411 Fayetteville Street • P. O. Box 1551 • Raleigh, N. C. 27602

Should you have any questions concerning this letter, please do not hesitate to contact a member of our Licensing Staff.

Yours very truly,

P. W. Howe

P. W. Howe
Vice President
Brunswick Nuclear Project

PPC/ccc (9438PPC)

cc: Mr. D. O. Myers (NRC-BSEP)
Mr. J. P. O'Reilly (NRC-RII)
Mr. M. Grotenhuis (NRC)

ATTACHMENT 1

SIGNIFICANT GEOMETRY INDICATIONS

WELD NUMBER	CONFIGURATION	MAXIMUM AMPLITUDE	DISPOSITION
2B32-12"-AR-D4	SE-P	35%	Re-examined with 60° and determined to be root geometry. This was confirmed with RT.
2B32-12"-AR-E3	P-E	90%	Based upon transducer position and metal path of indication the signal was determined to be root geometry. Indication was seen for the entire circumference of the weld and confirmed with RT.
2B32-12"-BR-G2	P-E	63%	Re-examined with 60° and determined to be ID geometry from the outer portion of counterbore. Verified with PSI data.
2B32-12"-BR-F2	P-E	65%	Based on transducer position and metal path of the indication, the signal was determined to be ID geometry from the outer portion of counterbore. Indication was seen 360° and verified with PSI data.
2B32-12"-AR-A2	P-E	90%	Based on transducer position and metal path of the indication, signal was determined to be ID geometry from the outer portion of the counterbore. Indication was seen 360° and verified with PSI data.
2B32-28"-A15	E-P	80%	Based on transducer position and metal path of the indication, the signal was determined to be ID geometry from the weld root. The same signal was seen from both sides of the weld for 360°.
		70%	Based on transducer position and metal path of the indication, signal was determined to be ID geometry from the outer counterbore.

WELD NUMBER	CONFIGURATION	MAXIMUM AMPLITUDE	DISPOSITION
2B32-28"-B8	E-V	60%	Based on transducer position and metal path of the indication, signal was determined to be ID geometry from the outer counterbore. Indication was seen 360°.
2B32-28"-B14	V-E	100%	Same as 2B32-28"-B8.
2B32-12"-AR-D2	P-E	90%	Based on transducer position and metal path of the indication signal was determined to be ID geometry from inner counterbore. Signal was seen 360° with mode conversion to the weld crown. Indication correlated with PSI data.
2B32-12"-AR-E2	P-E	65%	Based on transducer position and metal path of the indication, the signal was determined to be ID geometry from the counterbore. The signal damped on the weld crown and was seen 360°. The signal correlated with the PSI data.
2B32-28"-A3	P-E	70%	Based on transducer position and metal path of the indication, the signal was determined to be ID geometry from the counterbore. The signal was seen 360° and accompanied by mode conversion.
2B32-12"-BR-H2	P-E	45%	Based on transducer position and metal path of the indication, the signal was determined to be ID geometry from the counterbore. Indication was seen 360°.
2B32-12"-AR-B1	BC-P	60%	Based on transducer position and metal path of the indication, the signal was determined to be ID geometry from the counterbore. Indication was seen 360°.
2B32-12"-BR-H3	P-E	40%	Based on transducer position and metal path of the indication, the signal was determined to be ID geometry from the counterbore. Indication was seen 360° and correlated with PSI data.

WELD NUMBER	CONFIGURATION	MAXIMUM AMPLITUDE	DISPOSITION
2B32-12"-BR-G3	P-E		Same as 2B32-12"-BR-H3.
2B32-28"-A17	T-Cr	50%	Based on transducer position and metal path of the indication, the signal appeared to be internal mode conversion in the weld. Signal was seen 360°.
2B32-28"-A18	Cr-R	50%	Same as 2B32-28"-A17.
2B32-28"-B17	T-Cr	25%	Same as 2B32-28"-A17.
2B32-28"-B18	R-Cr	25%	Same as 2B32-28"-A17.
2B32-12"-AR-B3	E-P	80%	Based on transducer position and metal path of the indication, signal was determined to be ID geometry from the outer counterbore. Signal was seen 360° with mode conversion to the weld crown. Indication correlated with PSI data.
2B32-12"-AR-B4	SE-P	55%	Based on transducer position and metal path of the indication, signal was determined to be weld/ base metal interface.
		60%	Based on transducer position and metal path of the indication the signal was determined to be ID geometry from the counterbore.
2B32-12"-BR-F3	P-E	25%	Based on transducer position and metal path of the indication, signal was determined to be ID geometry from the counterbore.
2B32-12"-AR-B2	P-E	45%	Based on transducer position and metal path of the indication, signal was determined to be ID geometry from the outer counterbore. The signal was seen 360° and correlates to PSI data.
2B32-12"-AR-D3	P-E	55%	Based on transducer position and metal path of the indication, the signal was determined to be ID geometry outer counterbore. Signal was seen 360° with mode conversion to the weld crown.

WELD NUMBER	CONFIGURATION	MAXIMUM AMPLITUDE	DISPOSITION
2B32-28"-A9	V-P	50%	Based on transducer position and metal path of the indication, signal appeared to be root geometry. This was confirmed with a 60° examination.
2B32-28"A11	E-Pump	130%	Based on transducer position and metal path of the indication, the signal was determined to be ID geometry signal was determined to be ID geometry from the inner counterbore. The signal was seen 360° and correlated to PSI data.
2B32-28"-A12	Pump-P	50%	Based on transducer position and metal path of the indication, the signal was determined to be ID geometry from the weld root. The signal was seen 360° and confirmed with RT.
2B32-28"-A10	P-E	50%	Based on transducer position and metal path of the indication, the signal was determined to be ID geometry from the weld root. The signal was seen 360° and damped on the OD surface. This was confirmed with a 60° examation.
2B32-38"-B7	P-E	50%	Based on transducer position and metal path of the indication, the signal was determined to be ID geometry from the counterbore area. The signal was seen 360°.
2B32-28"-B9BC	P-Sad	50%	Based on transducer position and metal path of the indication, the signal was determined to be ID geometry from the weld root. The signal was seen 360°.
2B32-28"-B11	E-Pu	60%	Same as 2B32-28"-B9BC
2B32-28"-A7	P-E	30%	Based on transducer position and metal path of the indication, the signal was determined to be ID geometry from weld root. Signal was seen 360° and confirmed with 60° examination.
2B32-22"-AM-6	P-Cp	80%	Indication was seen intermittently 360° and determined to be ID geometry.

WELD NUMBER	CONFIGURATION	MAXIMUM AMPLITUDE	DISPOSITION
2B32-22"-AM-1	P-V	100%	Indication was seen 180° and determined to be ID geometry.
2B32-22"-BM-2	P-Cr	95%	Indication was seen intermittently 360° and determined to be ID geometry.
2B32-22"-AM-2	P-V	100%	Indication was seen intermittently for 180° and was determined to be ID geometry.

ABBREVIATIONS

BC: Branch Connection
Cp: Cap
Cr: Cross
E: Elbow
P: Pipe
Pu: Pump
R: Reducer
RT: Radiograph
Sad: Saddle
SE: Safe End
T: Tee
V: Valve

DISPOSITION SUMMARY

Indications were plotted using ultrasonic thickness measurements and weld preparation drawings. The scope watchers were EPRI qualified Level II examiners who have been trained to distinguish geometric versus IGSCC indications. Indications were evaluated by an EPRI qualified Level III and data was reviewed by a CP&L Level III. The ability to distinguish geometry from IGSCC indications was demonstrated during the examinations of welds 2B32-12"-A14, 2B32-12"-BR-J3, 2B32-12"-BR-J2, and 2B32-12"-BR-K2. In these welds IGSCC was detected adjacent to areas where significant geometric indications were recorded.