CP&L

Carolina Power & Light Company

Brunswick Steam Electric Plant
P. O. Box 10429 • Southport, N. C. 28461

March 30, 1992

RUSSELL B. STARKEY, JR.
Vice President
Brunswick Nuclear Project

SERIAL: NLS-92-102

United States 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
FEEDWATER NOZZLE N4D SAFE END UT INDICATION
(NRC TAC NO. M81880)

Gentlemen:

The purpose of this letter is document information presented to the NRC Staff during a telephone conference call conducted on March 26, 1992. This telephone call related to Carolina Power & Light Company's commitments for the monitoring of crack growth rate conditions in the reactor coolant system using data obtained from the crack arrest verification system (CAVS).

By letter dated January 10, 1992 (Serial: NLS-91-335), CP&L provided information concerning the Company's intended actions based on the crack arrest verification system monitoring. On May 16, 1991, CP&L initiated crack arrest verification system data to validate the crack growth law model used to justify operation for the current operating cycle. On March 21, 1992, operations personnel observed an increase in Unit 1 reactor coolant system leakage as monitored through the primary containment (drywell) floor drain. Although the specific origin of the leakage was unknown, the leakage is believed to be the result of a packing leak on one or more reactor coolant system valves. The Unit 1 Technical Specifications limit the amount of unidentified reactor coolant system leakage to the following:

- A 2 gpm increase in unidentified leakage within any 24 hour period
- 5 gpm unidentified leakage over any 24 hour period.

As a result of this increasing Unit 1 drywell floor drain leakage, the B32-F019 containment isolation valve was closed. Closure of this valve did result in a decrease in observed flow to the drywell floor drains and supported the belief that the leakage is the result of a packing leak on the B32-F019 valve. Closure of the

B32-F019 valve isolates flow to the 3/4-inch sample line that provides reactor coolant system flow to the crack arrest verification system. There are no alternate means of providing reactor coolant sample flow to the crack arrest verification system; therefore, monitoring of reactor coolant system crack growth rate conditions cannot be continued at this time.

The enclosed table (Table 1) divides crack arrest verification monitoring for Unit 1 Cycle 8 operation into five distinct periods. For period 1 (2/22/91 to 5/16/91), continuous crack arrest verification system monitoring was not performed; therefore, the maximum average crack arrest verification system growth rate (2.45E-5 inches/hour) was assumed. For the second period (5/16/91 to 3/13/92), crack arrest verification system measurements indicated a growth rate of 1.1E-5 inches/hour for a total of 0.0715 inches of growth as shown in Enclosure 3. For the third period (the current operational period for Unit 1), crack arrest verification system monitoring cannot be continued due to isolation of the B32-F019 valve; therefore, the maximum average crack arrest verification system growth rate was assumed. For the fourth period (6/05/92 to 6/21/92), Unit 1 will be shut down for a surveillance testing outage; therefore, no crack arrest verification system growth will occur or be recorded. For the fifth period (6/22/92 to 9/11/92), the maximum average crack arrest verification system growth rate was conservatively assumed, although the crack arrest verification system will be restored to service. These assumptions are conservative based on the observed ten months of crack arrest verification system determined crack growth rate for period 2. Reactor coolant system chemistry is not expected to change appreciably during the current cycle, thereby ensuring that the crack growth rate for the balance of the current operating cycle remains conservatively bounded.

The total crack arrest verification system growth measured and conservatively projected from the five periods discussed is 0.1946 inches compared to the ASME Code, Section XI flaw limit's allowable growth of 0.3219 inches. Therefore, based on conservative projection of crack arrest verification system and corresponding feedwater nozzle flaw growth, continued operation of Brunswick Unit 1 until a scheduled surveillance testing outage in June 1992 without the availability of the crack arrest verification system is justified and has no adverse impact on the health and safety of the public.

At present, a three-week outage is scheduled to begin either May 30, 1992 or June 5, 1992 to perform routine surveillance tests. During this outage, the Company intends to repair the B32-F019 valve, thereby allowing restoration of reactor coolant system sample flow to the crack arrest verification system following unit re-start. Until the planned surveillance testing outage, the Company intends to perform the alternate crack growth monitoring by inferring the Inconel-182 crack propagation rate on a monthly basis using the average conductivity and a calculational model found in EPRI draft report RP2006-17. The model yields the three curves shown in Enclosure 2. The top curve represents the Brunswick Plant situation based on an Inconel-182 ECP of 120 - 130 mVSHE. For example, at 0.20 μs/cm the growth rate is 1.28E-8 cm/sec or 1.81E-5 inches/hour. This seems to compare well to crack arrest verification system data for this environment and provides additional assurance to the 10 months of crack growth history accumulated since the Company's commitment to monitor crack arrest verification data. If the calculation yields a growth rate that exceeds the analyzed value of 2.45E-5 inches/hour, then accelerated monitoring would be performed as described in our previous commitment letter. The average Unit 1 conductivity for the year-to-date is 0.125 μs/cm and is 0.175 μs/cm for the cycle to date.

The Company requests the NRC Staff provide verbal feedback at their earliest convenience on the acceptability of the alternate crack growth rate monitoring method described herein pending repair of the B32-F019 valve.

Please refer any questions regarding this submittal to Mr. W. R. Murray at (919) 546-4661.

Yours very truly,

R. B. Starkey, Jr.

WRM/wrm (bnp1cav.wpf)

Enclosures

cc: Mr. S. D. Ebneter
Mr. N. B. Le
Mr. R. L. Prevatte

ENCLOSURE 1

BRUNSWICK STEAM ELECTRIC PLANT, UNIT 1
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SUMMARY OF BRUNSWICK PLANT, UNIT 1
CRACK ARREST VERIFICATION SYSTEM
MONITORING DURING CYCLE 8 OPERATION

TABLE 1

BRUNSWICK PLANT, UNIT 1 CAV MONITORING

PERIOD	TOTAL HOURS	OPERATING HOURS	REMARKS	CAV ΔA (INCHES)	CORRESPONDING PREDICTED FW FLAW ΔA (INCHES)
2/22/91 - 5/16/91	1975	1064	Start of Operating Cycle (Assumed Maximum Growth Rate)	(0.0261)	0.007[illegible]
5/16/91 - 3/13/92	7220	6445	CAV Monitor In Service	0.0715	0.02[illegible]
3/13/92 - 6/05/92	1992	1992	CAV Monitor Not In Service (Assume Maximum Growth Rate)	(0.0488)	0.0153
6/05/92 - 6/21/92	408	0	Surveillance Testing Outage	0	0
6/22/92 - 9/11/92	1968	1968	Remaining Operating Cycle (Assume Maximum Growth Rate)	(0.0482)	0.0173
TOTAL	13,564	11,469		0.1946	0.0612

ENCLOSURE 2

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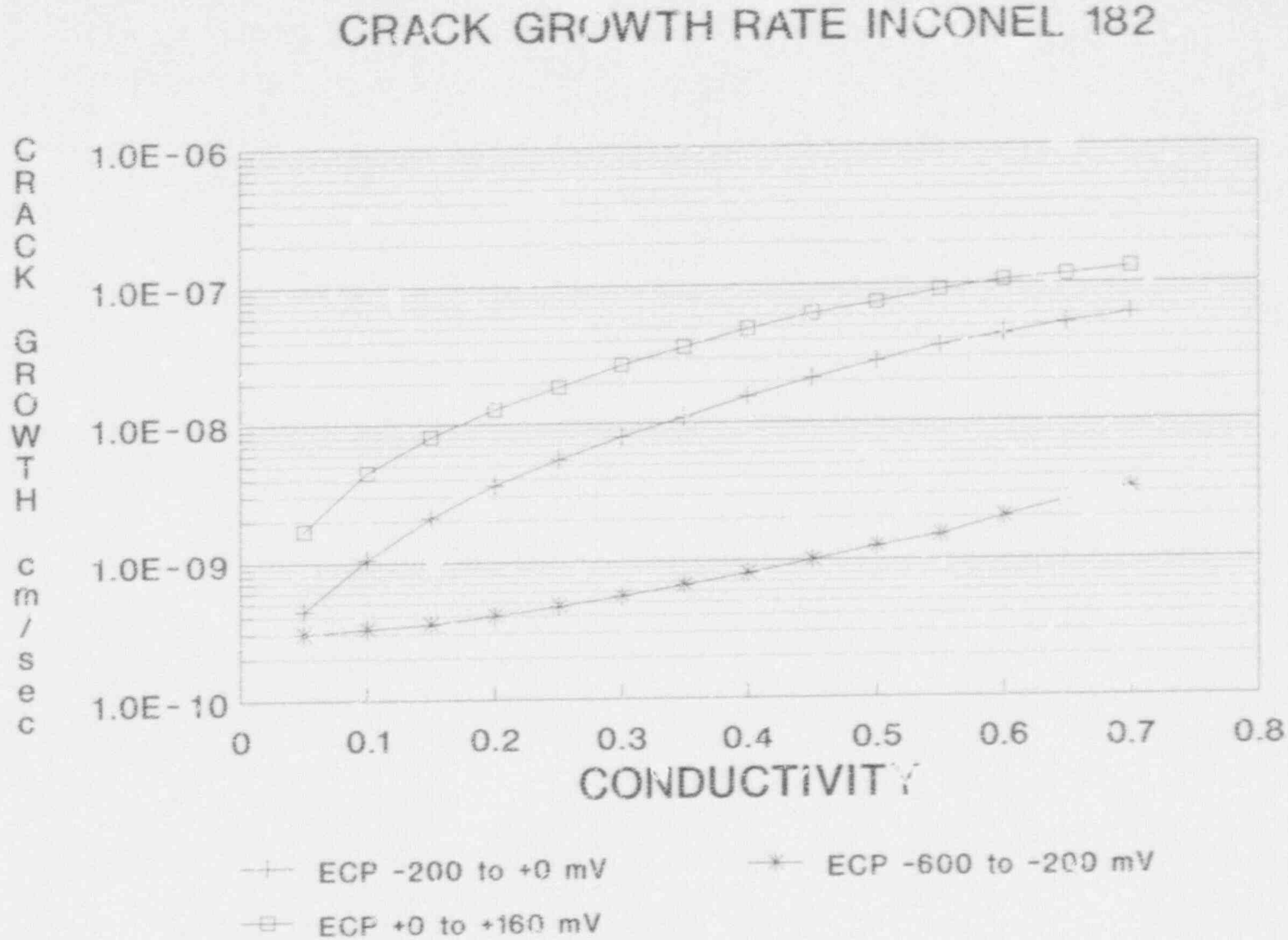

K = 25 to 31 ksi $\sqrt{ins}$, Temp. = 288 °C

FIGURE 2

ENCLOSURE 3

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BRUNSWICK UNIT 1 C. A. V. SYSTEM DATA

INCONEL 182 SPECIMEN CRACK GROWTH