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 AUTH. NAME: AUTHOR AFFILIATION
 UTLEY, E.E. Carolina Power & Light Co.
 RECIPIENT NAME: RECIPIENT AFFILIATION
 VARGA, S.A. Operating Reactors Branch 1

SUBJECT: Forwards three tables summarizing preliminary results of
 Nov 1983 steam generator eddy current insp per 831122
 meeting re results of steam generator eddy current inps
 program.

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DEC 09 1983

E. E. UTLEY
Executive Vice President
Power Supply and Engineering & Construction

Director of Nuclear Reactor Regulation
Attention: Mr. Steven A. Varga, Chief
Operating Reactors Branch No. 1
Division of Licensing
United States Nuclear Regulatory Commission
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261
LICENSE NO. DPR-23
PRELIMINARY RESULTS STEAM GENERATOR EDDY CURRENT INSPECTION
AND JUSTIFICATION FOR CONTINUED OPERATION

Dear Mr. Varga:

On November 17 and 18, 1983, Carolina Power and Light Company (CP&L) held two telephone conference calls with the NRC Staff and on November 22, 1983 a meeting was held with you regarding the results of the H. B. Robinson Steam Electric Plant, Unit No. 2 (HBR2) November 1983 Steam Generator (SG) Eddy Current (E/C) Inspection Program. During these conversations, CP&L related to your staff its evaluation of these results and its plans for operation for the remaining portion of this operating cycle (Cycle 9). Based on these results, the intent of this letter is to document these discussions.

Please find the attached three tables summarizing the preliminary results of the November 1983 Steam Generator Eddy Current Inspection. Included in these results are the distribution of eddy current indications, the calculated thinning rates including plugged and unplugged tubes, and a summary of tubes plugged in this outage.

During the November 1983 outage a total of 575 tubes were plugged. The major corrosion mechanism is believed to be phosphate thinning. A plugging criteria of greater than 47% through wall indication was used in determining which tubes to plug. Based on this plugging limit and the minimum required tube wall thickness of 32% (main steam line break accident conditions) the remaining tube wall thickness available for corrosion is 21%. The justification for this minimum required tube wall and remaining tube wall thickness was provided to you in our letter dated July 18, 1983, "May

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Steven A. Varga

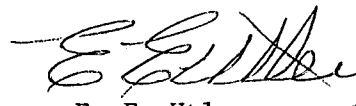
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1983 Steam Generator Eddy Current Inspection Report," Section I.1.6, "Return to Power Evaluation". Using the worst case average thinning rate of 6.63%/EFPM (see table 2) an operating cycle of at least 1.7 EFPM, which is the maximum remaining exposure left in the current core, is justified.

As discussed in our meeting with you, CP&L has evaluated the loss of feedwater transient at 23.7 percent tube plugging and has verified the results to be acceptable, thereby not requiring a modification to the main steam safety valve setpoints as indicated in our correspondence to you dated October 5, 1983 transmitting our justification for 30 percent tube plugging. (Reference Exxon Nuclear Company report, XN-NF-82-18(P) Supplement 2, "ECCS and Plant Transient Analyses for H. B. Robinson Unit 2 Reactor Operating at Reduced Primary Temperature Supplement 2 Analyses for 30 percent Steam Generator Tube Plugging," September 1, 1983.)

A complete report describing the November 1983 Steam Generator Eddy Current Inspection and the scope for the next inspection is scheduled to be provided to your office in mid January 1984. Should you have any questions concerning the attached information or our operational plan please contact my staff.

Yours very truly,



E. E. Utley

DCS/cfr (8694DCS)

cc: Mr. J. P. O'Reilly (NRG-RII)
Mr. G. Requa (NRC)
Mr. Steve Weise (NRG-HBR)

PRELIMINARY

TABLE IA

EDDY CURRENT INDICATION DISTRIBUTIONS FOR
STEAM GENERATOR ELEVATIONS WHERE INDICATIONS
WERE OBSERVED (IN TERMS OF NUMBER OF INDICATIONS REPORTED
FOR VARIOUS RANGES OF PERCENT TUBEWALL PENETRATION)

H. B. ROBINSON UNIT #2
NOVEMBER, 1983 STEAM GENERATOR INSPECTION

ELEVATION	<20	20-26	27-33	34-40	41-47	48-54	55-61	62-68	69-75	76-82	83-89	90-96	97-100
<u>S/G A HL</u>													
BTS	1	0	0	0	0	0	0	0	0	4	4	2	0
TTS	7	7	3	3	6	1	3	1	0	0	0	0	0
ATS	405	243	156	102	42	16	10	5	5	5	0	1	0
TSP	23	14	11	8	0	1	0	0	0	0	0	0	0
UB	106	43	22	14	10	1	0	0	0	0	0	0	0
TOTALS	542	307	192	127	58	19	13	6	5	9	4	3	0
<u>S/G A CL</u>													
BTS	1	1	0	2	0	0	0	0	0	0	0	0	0
TTS	33	17	10	16	14	5	2	8	0	1	0	2	0
ATS	350	229	196	136	55	18	6	2	3	2	1	1	1
TSP	226	199	165	122	44	7	2	2	0	0	0	0	0
UB	1	1	1	0	0	0	0	0	0	0	0	0	0
TOTALS	611	447	372	276	113	30	10	12	3	3	1	3	1

BTS - Within the tube sheet
TTS - Top of the tube sheet
ATS - Above the tube sheet
TSP - Tube Support Plate
UB - U Bend Region

PRELIMINARY

TABLE 1B

EDDY CURRENT INDICATION DISTRIBUTIONS FOR
STEAM GENERATOR ELEVATIONS WHERE INDICATIONS
WERE OBSERVED (IN TERMS OF NUMBER OF INDICATIONS REPORTED
FOR VARIOUS RANGES OF PERCENT TUBEWALL PENETRATION)

H. B. ROBINSON UNIT #2
NOVEMBER, 1983 STEAM GENERATOR INSPECTION

ELEVATION	<20	20-26	27-33	34-40	41-47	48-54	55-61	62-68	69-75	76-82	83-89	90-96	97-100
	<u>S/G B HL</u>												
BTS	0	0	0	0	0	0	0	1	2	2	4	0	1
TTS	25	16	25	21	28	13	10	8	8	5	2	0	0
ATS	233	90	54	49	36	9	16	12	16	14	8	2	1
TSP	42	13	10	10	4	0	0	1	0	0	0	0	0
UB	66	24	8	12	3	1	0	0	0	0	0	0	0
TOTALS	366	143	97	92	71	23	26	22	26	21	14	2	2
	<u>S/G B CL</u>												
BTS	0	0	0	1	0	0	0	0	0	0	0	0	0
TTS	32	14	18	21	52	19	9	8	1	0	0	0	1
ATS	184	146	196	149	91	20	12	12	6	4	3	1	0
TSP	85	50	65	54	26	4	0	1	0	2	0	0	0
UB	0	0	0	0	0	1	0	0	0	0	0	0	0
TOTALS	301	210	279	225	169	44	21	21	7	6	3	1	1

PRELIMINARY

TABLE 1C

EDDY CURRENT INDICATION DISTRIBUTIONS FOR
STEAM GENERATOR ELEVATIONS WHERE INDICATIONS
WERE OBSERVED (IN TERMS OF NUMBER OF INDICATIONS REPORTED
FOR VARIOUS RANGES OF PERCENT TUBEWALL PENETRATION)

H. B. ROBINSON UNIT #2
NOVEMBER, 1983 STEAM GENERATOR INSPECTION

ELEVATION	<20	20-26	27-33	34-40	41-47	48-54	55-61	62-68	69-75	76-82	83-89	90-96	97-100
<u>S/G C HL</u>													
BTS	1	0	1	0	0	0	0	0	0	1	0	4	3
TTS	62	18	15	16	15	11	7	7	4	2	2	2	0
ATS	303	142	93	68	36	15	8	4	8	3	3	2	0
TSP	18	3	7	7	3	1	0	0	0	0	0	1	0
UB	209	37	18	9	3	0	0	0	0	0	0	0	0
TOTALS	593	200	134	100	57	27	15	11	12	6	5	9	3
<u>S/G C CL</u>													
BTS	0	0	0	0	0	0	0	0	0	0	0	0	0
TTS	41	25	26	26	24	13	8	8	2	3	2	2	0
ATS	201	190	251	237	123	66	22	13	8	2	3	6	3
TSP	70	36	42	55	28	19	10	9	1	1	0	0	0
UB	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	312	251	319	318	175	98	40	30	11	6	5	8	3

TABLE 2
 STEAM GENERATOR THINNING RATES
 H. B. ROBINSON UNIT #2
 NOVEMBER 1983 STEAM GENERATOR INSPECTION

S/G LEG	NUMBER OF COMPARISONS						THINNING RATES (% PER EFPM)						WT. AVE CORROSION*	
	PLUGGABLES INCLUDED			PLUGGABLES DELETED			PLUGGABLES INCLUDED			PLUGGABLES DELETED			PLUGGABLES INCLUDED	PLUGGABLES DELETED
	ATS/TTS	TSP	UB	ATS/TTS	TSP	UB	ATS/TTS	TSP	UB	ATS/TTS	TSP	UB		
A H/L	422	30	86	384	29	85	4.40	7.16	8.25	3.54	6.95	4.27	5.16	3.87
A C/L	698	314	2	649	311	2	6.85	7.30	7.97	6.33	7.22	7.97	6.99	6.63
B H/L	354	33	38	236	33	37	6.25	6.18	2.85	3.38	6.18	2.55	5.94	3.57
B C/L	723	109	1	624	104	0	5.82	5.00	4.67	4.93	4.59	0	5.7	4.89
C H/L	431	22	50	359	21	50	4.56	8.93	5.24	3.09	7.82	5.24	4.83	3.57
C C/L	1054	113	0	899	84	0	4.23	5.32	0	3.12	5.05	0	4.35	3.27

* Based on the fact that the predominant mode of corrosion throughout the generators is the same, phosphate thinning, a weighted average was used in evaluating steam generator corrosion values.

$$\begin{aligned} \text{Wt. Avg. Corrosion} = & \# \text{ATS/TTS Comparisons} \times \text{ATS/TTS thinning rates} + \# \text{TSP Comparisons} \times \text{TSP thinning rates} + \\ & \# \text{UB Comparisons} \times \text{UB thinning rates} + \# \text{ATS/TTS Comparisons} + \# \text{TSP Comparisons} \\ & + \# \text{UB Comparisons} \end{aligned}$$

PRELIMINARY

TABLE 3

Summary of Number of Steam Generator Tubes Plugged
H. B. Robinson Unit #2
November 1983 Steam Generator Inspection

<u>SG LEG</u>	<u>NUMBER OF TUBES PLUGGED</u>		<u>TOTAL PERCENTAGE</u> <u>OF TUBES PLUGGED</u>
		<u>TOTAL</u>	
A H/L	56	116	15%
A C/L	59	(490)*	
A UB	1		
B H/L	107	217**	28.9%
B C/L	107	(942)	
B UB	1		
C H/L	81		
C C/L	161	242	24%
C UB	0	(781)	
	OVERALL TOTALS	575 (2213)	22.6%

H/L - HOT LEG
C/L - COLD LEG
UB - U BEND

*() - TOTAL TUBES PLUGGED IN SG

**Two tubes in the B SG were plugged inadvertently bringing the total tubes plugged to 217 versus the 215 requiring plugging due to corrosion.