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RECIP.NAME RECIPIENT AFFILIATION
VARGA,S.A. Operating Reactors Branch 1

SUBJECT: Application to amend License DPR-23,revising License Condition 3.I to delete requirement for primary to secondary pressure test.

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CP&L
Carolina Power & Light Company

July 13, 1982

Office of Nuclear Reactor Regulation
ATTN: Mr. Steven A. Varga, Chief
Operating Reactors Branch No. 1
United States Nuclear Regulatory Commission
Washington, D.C. 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261
LICENSE NO. DPR-23
SUPPLEMENTAL REQUEST FOR LICENSE AMENDMENT
CYCLE 9 OPERATION

Dear Mr. Varga:

Summary

Several telephone conversations were held between Carolina Power & Light Company (CP&L), Westinghouse and NRC Staff personnel regarding the results of the steam generator (SG) tube plugging effort following Cycle 8 at H. B. Robinson, Unit No. 2 (HBR2). Carolina Power & Light Company provided NRC with information justifying continued operation with the present plugging criteria of 47 percent and, based on expected corrosion rates, justified operation for at least six effective full-power months (EFPM) before a SG eddy current inspection would be required. Based on this information, CP&L committed to certain actions during the upcoming operating cycle (Cycle 9). The intent of this letter is to document this justification and the commitments which CP&L made based on this justification. This letter also requests a revision to the operating license reflecting these commitments.

Discussion

During several telephone conversations the week of July 4, 1982, CP&L and Westinghouse discussed informally with the NRC Staff the results of our recent SG eddy current (E/C) inspection program following Cycle 8 operation. During these discussions NRC questioned our use of 47 percent as a tube plugging limit since the 47 percent was based in part on an average corrosion rate of 2 percent per EFPY and our reported corrosion rate exceeded this percentage. This latter corrosion rate would not allow the plant to operate for a full cycle without shutting down. Carolina Power & Light Company agrees that a full cycle's operation was not possible with that corrosion rate, but that based on the attached data (Attachment A), operation for six EFPM is clearly justified with adequate margin. The plugging limit is generally based on the worst case minimum wall thickness remaining that can withstand the stress due to an accident plus a safe shutdown earthquake or normal operating differential pressure plus a safety factor. This minimum

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wall also includes a measurement uncertainty for E/C readings and an allowance for corrosion rate between shutdowns. The 9 percent E/C uncertainty was needed for certain types of defects that E/C measurements could under predict. From the data and curves, previously telecopied to NRC the week of July 5, 1982, for thinning it can be seen that E/C measurements consistently under predict minimum wall by at least 10 percent. For this reason thinning plugging limits need not include an E/C uncertainty. As shown by the data, for thinning the 9 percent E/C uncertainty may be deleted due to the E/C probe consistently under predicting the minimum wall. Since the worst case corrosion mechanism is now phosphate thinning the worst case corrosion rate is now 1.14 percent. Based on this rate the minimum time required before a subsequent inspection is 9.65 EFPM. However, because of CP&L's interest in optimizing SG performance we will perform the inspection prior to six EFPM of operation

Commitments

Based on the above discussions, CP&L has made the following commitments for Cycle 9 operation:

1. Prior to six (6) effective full-power months (EFPM) of operation a S/G eddy current examination will be performed. The scope of the inspection to be performed will be provided to the NRC for approval at least 45 calendar days prior to the inspection.

2. During the Cycle 9 operations, the following steam generator tube leakage criteria shall be in effect. Specifically, the plant shall be shut down for appropriate corrective action if the verified primary to secondary leakage in one steam generator exceeds any of the following:

   (1) A sudden increase of 0.1 gallon per minute (gpm) if the total leakage rate in that steam generator exceeds 0.2 gpm.

   (2) If the leakage rate in that steam generator exceeds 0.2 gpm and an upward trend in leakage rate in excess of 0.02 gpm per day is verified. This trend will be established using at least five valid consecutive daily samples.

3. Should the plant be required to shut down to repair a steam generator tube leak as indicated in Item 2 above, an inspection shall be performed as mutually agreed upon by the NRC staff and CP&L, except in the case of steam generator tube plug leaks.

4. The NRC staff will be provided with a summary of the results of the eddy current inspection described in Item 1.

Carolina Power & Light Company is currently preparing the final 1982 Steam Generator Report which will document the results of the 1982 refueling outage eddy current inspection and recent discussions with the NRC staff.

This report is scheduled for submission to the NRC by September 1, 1982 contingent on the completion date of the present refueling outage.

Request for License Amendment

Amendment No. 61 to HBR2's operating license issued a license condition 3.I documenting CP&L's commitments regarding steam generator inspections for the remainder of Cycle 8 operations. This requested change is being made to reflect CP&L's aforementioned commitments for Cycle 9. In accordance with the Code of Federal Regulations, Title 10, Part 50.90 and Part 2.101, CP&L hereby requests revisions to license condition 3.I for H. B. Robinson, Unit No. 2. The requested changes are shown in Attachment B. The requirement for a primary to secondary pressure test has been deleted. The purpose of this pressure test was to detect leakage due to stress corrosion cracking above the tube sheet. As a result of the plant operating at reduced temperature during Cycle 8, this mode of defect has been virtually arrested. Since the future operations will be conducted at reduced temperature, this testing is no longer necessary.

As this change is purely administrative in nature and is a supplement to our previous submittals for Cycle 9 operation, for which a fee has already been remitted, no further fee is required.

Conclusions

Based on the aforementioned justifications and commitments, CP&L can operate throughout Cycle 9 with no adverse impact on the public health and safety.

If you have any questions regarding this information, please contact a member of my staff.

Yours very truly,

P. W. Howe
Vice President
Technical Services

DCS/cr (335C6T5)
Attachments

cc: Mr. James P. O'Reilly (Region II)
Mr. G. Requa (ONRR)
Mr. S. Weise (NRC Resident Inspector)

P. W. Howe, having been first duly sworn, did depose and say that the information contained herein is true and correct to his own personal knowledge or based upon information and belief.

Franklin Murray
Notary (Seal)

FRANKLIN MURRAY NOTARY PUBLIC WAKE COUNTY, N.C.

My commission expires: OCT 04 1986

ATTACHMENT A

This attachment provides the justification for operation of the H. B. Robinson Steam Generators (S/G) for six (6) effective full power months (EFPM). Carolina Power & Light Company performed an eddy current inspection of all unplugged tubes in all three S/Gs (excluding 6 tubes in "B" S/G which were not physically accessible to the eddy current probe). Each tube was 100 percent inspected from tube end to tube end. The detailed results of this inspection will be provided in the final S/G report, however, the following general conclusions can be drawn.

1. The above-the-tube-sheet stress corrosion cracking identified in the August 1982 S/G inspection has been completely arrested by the reduced temperature operation in effect since August.

2. The rate of thinning in the cold legs of B & C S/G has increased significantly. This increase could be due to phosphate corrosion as a result of reduced temperature operation.

3. The limiting corrosion rate in the S/Gs is in the cold leg of C S/G. This rate was calculated by considering the increase in tube degradation since the last inspection of all unplugged tubes with indications greater than 20 percent.

Region	Total Degradation	No. Tubes	Rate %/EFPM
A Inlet	-629	192	-1.14
A Outlet	-165	121	- .43
B Inlet	- 50	185	- .085
B Outlet	593	240	.78
C Inlet	257	113	.72
C Outlet	1025	285	1.14

Carolina Power & Light Company used the following method to calculate the minimum time until the next eddy current inspection would be required due to corrosion of the S/Gs. As required by NRC (CP&L disagrees with this position and will describe its position in the final S/G report) a minimum wall thickness of .021 inches (42 percent of the tube wall) was assumed to be required. The Technical Specification plugging limit of 47 percent tube wall was used during the current 1982 refueling outage. As demonstrated by the data and curves previously submitted to the NRC, during the week of July 5, 1982, the 47 percent plugging limit is greater than 10 percent more conservative for the case of thinning. That is, the eddy current technique underestimates the remaining tube wall by more than 10 percent of the wall thickness for a tube that is degraded by thinning. Since the eddy current measurement effectively includes an inherent penalty due to underestimating the remaining wall (i.e., overestimating the depth of penetration due to thinning), there is no need to include another arbitrary eddy current error penalty of 9 percent as has been done in previous submittals. Using the minimum wall thickness of 42 percent and a plugging limit of 47 percent penetration, the remaining wall thickness of 11 percent is available for corrosion. Given the limiting corrosion rate of 1.14 %/EFPM, the minimum operating time until an eddy current inspection would be required is 11 % ÷ 1.14%/EFPM = 9.65 EFPM.

Carolina Power & Light Company believes that this information clearly demonstrates that the H. B. Robinson S/Gs can be operated for six EFPM and still have a significant margin of conservatism.

ATTACHMENT B

3.I. The following Operating License condition is effective from the time H. B. Robinson Unit 2 returns to power operation for Cycle 9 operation and is to remain in effect until the next refueling outage:

a. Prior to six effective full-power months of operation a steam generator eddy current examination shall be performed. The scope of the inspection to be performed shall be provided to the NRC for approval at least 45 calendar days prior to the inspection.

b. During the Cycle 9 operations, the following steam generator tube leakage criteria shall be in effect. Specifically, the plant shall be shut down for appropriate corrective action if the verified primary to secondary leakage in one stam generator exceeds any of the following:

(1) A sudden increase of 0.1 gallon per minute (gpm) if the total leakage rate in that steam generator exceeds 0.2 gpm.

(2) If the leakage rate in that steam generator exceeds 0.2 gpm and an upward trend in leakage rate in excess of 0.02 gpm per day is verified. This trend will be established using at least five valid consecutive daily samples.

c. Should the plant be required to shut down to repair a steam generator tube leak as indicated in Item b. above, an inspection shall be performed as mutually agreed upon by the NRC staff and CP&L except in the case of steam generator tube plug leaks.

d. The NRC staff will be provided with a summary of the results of the eddy current inspection described in item a.