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DESCRIPTION: Ltr notarized 12-2-76 re their 11-17-76 submittal...trans the following:

SAME DISTRIBUTION AS 11-17-76 SUBMITTAL ON MAIL CONTROL 11743

PLANT NAME: H.B. Robinson Plant

ENCLOSURE: Amdt to Attachment 1 of J.A. Jones to R.W. Reid Ltr dated 11-17-76 re ECCS Reevaluation....

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ACKNOWLEDGED

FOR ACTION/INFORMATION ENVIRO DHL 12-4-76

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CONTROL NUMBER: 12252 (ECCS)

CP&L
Carolina Power & Light Company

Regulatory Docket File

December 2, 1976

FILE: NG-3514(R) SERIAL: NG-76-1555

Director of Nuclear Reactor Regulation
ATTN: Robert W. Reid, Chief
Operating Reactors Branch No. 4
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

H. B. ROBINSON STEAM ELECTRIC PLANT UNIT NO. 2
DOCKET NO. 50-261
FACILITY OPERATING LICENSE NO. DPR-23
RESPONSE TO ORDER - ECCS REEVALUATION

Dear Mr. Reid:

On November, 17, 1976, Carolina Power & Light Company (CP&L) submitted a partial response to the Order for Modification of License transmitted by your letter of August 27, 1976. Our letter contained the analyses for the Westinghouse fuel contained in H. B. Robinson Unit 2 and a summary of the analyses applicable to the Exxon fuel contained in the H. B. Robinson Plant. With this letter, CP&L formally submits the remainder of the information necessary to comply with the August 27, 1976, Order.

A modification to the Westinghouse analyses submitted in our November 17, 1976, letter is presented in Attachment 1. This modification was made to incorporate the Westinghouse break spectrum sensitivity study using the hot leg temperature ("Westinghouse ECCS Three Loop Plant [17x17] Sensitivity Studies," WCAP-8853, September, 1976 [Non-Proprietary]) as the method for determining the limiting break for H. B. Robinson.

On December 1, 1976, Exxon Report XN-76-54 was delivered to Mr. G. B. Zwetzig of your staff. This document contains the H. B. Robinson ECCS analyses required for compliance with the August 27, 1976, order. To expedite the NRC review of the information presented in this document, the Company hereby incorporates the report delivered to Mr. Zwetzig as an attachment to this letter and authorizes the Staff to make the assessments of the ECCS analyses based on that document. A complete transmittal of this report with forty (40) copies and three (3) originals as required by Commission regulations will be submitted when sufficient copies are available.

In the final phases of the review of material necessary to comply with the August 27, 1976 order, the Staff indicated that for the Exxon analysis, use of vessel outlet temperature for the upper vessel head temperature had not been established to be the conservative temperature. Additional information was requested on the effects of lower temperatures in the upper vessel head on the peak clad temperature (PCT). Exxon Nuclear Corporation provided a sensitivity study on the effects of lower temperatures of the upper vessel head on PCT for the

D. C. Cook docket. This information is addressed in a letter from Mr. G. F. Owsley of Exxon Nuclear to Mr. D. L. Ziemann of the NRC dated November 30, 1976. The information on this subject contained in the attachment to that letter will provide the Staff with the information necessary to evaluate the effects of temperature of the upper vessel head on PCT.

It is our understanding that this submittal and the submittal of November 17, 1976, provide the necessary information to allow the Staff to complete their evaluation of the ECCS analysis submitted in compliance with the Order for Modification of License of August 27, 1976.

As required by Commission regulations, this submittal is signed under oath by a duly authorized officer of the Company.

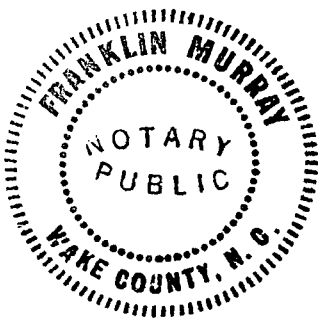
Yours very truly,

E. E. Utley
Vice President
Bulk Power Supply

MFP/dkm
Attachments

Sworn to and subscribed before me this 2nd day of December, 1976.

Franklin Murray
Notary Public



My Commission Expires October 4, 1981

ATTACHMENT 1

AMENDMENT TO ATTACHMENT 1 OF
J. A. JONES TO R. W. REID LETTER
DATED NOVEMBER 17, 1976

Figure 16 This figure provides the containment wall condensing heat transfer coefficient for the limiting case break.

In addition to the above, Tables 4 and 5 present reflood mass and energy release to the containment and the broken loop accumulator mass and energy flowrate to the containment, respectively.

The clad temperature analysis is based on a total peaking factor of 2.30. The analysis presented in this section was performed with a reactor vessel upper-head temperature equal to the RCS hot leg temperature. The effect of using the hot leg temperature in the reactor vessel upperhead is described in Reference (13). A break spectrum sensitivity study using the hot leg temperature is presented in Reference (15). The three cases were analyzed with 6% uniform steam generator tube plugging. The hot spot metal water reaction reached is 4.14%, which is well below the embrittlement limit of 17 percent, as required by 10CFR50.46. In addition, the total core metal-water reaction is less than 0.3 percent for all breaks as compared with the 1 percent criterion of 10CFR50.46.

The results of several sensitivity studies are reported in Reference (9). These results are for conditions which are not limiting in nature and hence are reported on a generic basis.

4.0 Conclusions - Thermal Analysis

For breaks up to and including the double ended severance of a reactor coolant pipe, the Emergency Core Cooling System will meet the Acceptance Criteria as presented in 10CFR50.46. That is:

1. The calculated peak fuel element clad temperature provides margin to the requirement of 2200°F, based on an F_Q value of 2.30.

2. The amount of fuel element cladding that reacts chemically with water or steam does not exceed 1 percent of the total amount of Zircaloy in the reactor.

3. The clad temperature transient is terminated at a time when the core geometry is still amenable to cooling. The clad oxidation limits of 17% are not exceeded during or after quenching.

8. Bordelon, F. M., et al., "Westinghouse ECCS Evaluation Model - Supplementary Information," WCAP-8471, April, 1975, (Proprietary) and WCAP-8472, April, 1975 (Non-Proprietary).

9. Salvatori, R., "Westinghouse ECCS - Plant Sensitivity Studies," WCAP-8340, July, 1974 (Proprietary) and WCAP-8356, July, 1974 (Non-Proprietary).

10. Buterbaugh, T. L., Julian, H. V., and Tome, A. E., "Westinghouse ECCS - Three Loop Plant (17 x 17) Sensitivity Studies," WCAP-8572-P, (Proprietary) and WCAP-8573-NP (Non-Proprietary).

11. "Westinghouse ECCS Evaluation Model - October 1975 Version," WCAP-8622, November, 1975, (Proprietary) and WCAP-8623, November, 1975, (Non-Proprietary).

12. Letter from C. Eicheldinger of Westinghouse Electric Corporation to D. B. Vassallo of the Nuclear Regulatory Commission, Letter Number NS-CE-92, dated January 23, 1976.

13. Letter from C. Eicheldinger of Westinghouse Electric Corporation to V. Stello of the Nuclear Regulatory Commission, Letter Number NS-CE-1163, dated August 13, 1976.

14. R. Solvatory, "Westinghouse Emergency Core Cooling System Evaluation Model - Sensitivity Studies," WCAP-8341, July, 1974 (Proprietary) and WCAP-8342, July, 1974 (Non-Proprietary).

15. Julian, H. V., Tabone, C. J., and Thompson, C. M., "Westinghouse ECCS - Three Loop Plant (17 x 17) Sensitivity Studies," WCAP-8853, September, 1976 (Non-Proprietary).

6.0 The purpose of the Reference 15 sensitivity study is to show that changing the upperhead water temperature does not change the limiting break type and location which is a double ended cold leg guillotine for a three loop plant. The three loop plant configuration used for this sensitivity study is sufficiently similar to the H. B. Robinson plant to assure that the limiting break is identified. The main difference between the plant configurations are fuel design, steam generator design, power level, vessel internals, and ECC system design. These differences do not change the basic effect resulting from higher upperhead temperature, that being the flash of water at the hot leg saturation pressure rather than the cold leg saturation pressure. In addition, all sensitivity studies (References 9, 10, and 15) performed for three loop plants have been consistent in verifying this limiting break type and location for Westinghouse plants whose designs reflect the differences noted between reference 15 and the H. B. Robinson Plant.