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DESCRIPTION Ltr notarized 11-17-76 trans the following:

ENCLOSURE H.B. Robinson Unit No. 2 Loss Of Coolant Accident Analyses 10CFR50 Appendix K dated Nov. 1976....

(40 cys encl rec'd)

PLANT NAME: H.B. Robinson Unit 2

Do Not Remove

ACKNOWLEDGED

566  
BPT

## SAFETY

## FOR ACTION/INFORMATION

## ENVIRO

DHL 11-18-76

ASSIGNED AD:		ASSIGNED AD:
BRANCH CHIEF: (6) Reid		BRANCH CHIEF:
PROJECT MANAGER: Zwetzig		PROJECT MANAGER:
LIC. ASST.: Ingram		LIC. ASST.:

## INTERNAL DISTRIBUTION

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<input checked="" type="checkbox"/> CASE	<input type="checkbox"/> SIHWEIL	<input type="checkbox"/> OPERATING REACTORS	<input type="checkbox"/> SPANGLER
HANAUER	<input type="checkbox"/> PAWLICKI	<input type="checkbox"/> STELLO	<input type="checkbox"/> SITE TECH.
HARLESS	<input type="checkbox"/> REACTOR SAFETY	<input type="checkbox"/> OPERATING TECH.	<input type="checkbox"/> GAMMILL
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<input checked="" type="checkbox"/> BOYD	<input checked="" type="checkbox"/> NOVAK	<input checked="" type="checkbox"/> SHAO	<input type="checkbox"/> HULMAN
<input checked="" type="checkbox"/> P. COLLINS	<input checked="" type="checkbox"/> ROSZTOCZY	<input checked="" type="checkbox"/> BAER	<input type="checkbox"/> SITE ANALYSIS
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<input checked="" type="checkbox"/> PETERSON	<input type="checkbox"/> AT & I	<input type="checkbox"/> GRIMES	<input type="checkbox"/> BUNCH
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## EXTERNAL DISTRIBUTION

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<input checked="" type="checkbox"/> ASLB:	<input type="checkbox"/> CONSULTANTS	
<input checked="" type="checkbox"/> ACRS 16 CYS	<input type="checkbox"/> Cat B	

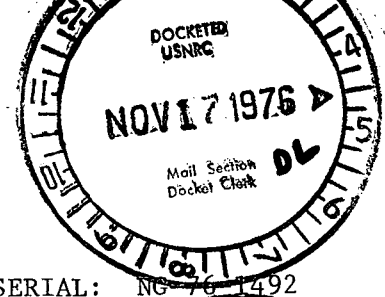
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Carolina Power & Light Company

November 17, 1976



FILE: NG-3514(R)

SERIAL: NG-76-1492

Director of Nuclear Reactor Regulation

ATTN: Robert W. Reid, Chief

Operating Reactors Branch No.

U. S. Nuclear Regulatory Commission

Washington, D. C. 20555

**Regulatory Docket File**



H. B. ROBINSON STEAM ELECTRIC PLANT UNIT NO. 2

DOCKET NO. 50-261

FACILITY OPERATING LICENSE DPR-23

RESPONSE TO ORDER - ECCS REEVALUATION

Dear Mr. Reid:

By copy of this letter, Carolina Power & Light Company (CP&L) hereby submits Loss-of-Coolant Accident (LOCA) analyses for its H. B. Robinson Unit No. 2 Plant in compliance with the Order for Modification of License transmitted by your letter of August 27, 1976. The analyses provided in Attachment I apply to the Westinghouse fuel contained in the H. B. Robinson Plant and were performed using the approved October, 1975, Westinghouse ECCS evaluation model.

A summary of analyses applicable to the Exxon fuel contained in H. B. Robinson is presented in Attachment II. These analyses were performed using the approved Exxon WREM model for H. B. Robinson, with the changes enumerated below.

The following parameters were used in the Westinghouse fuel analyses which represent changes from the previously approved H. B. Robinson analyses submitted in 1975. First, the upper head fluid temperature was increased from a value corresponding to the reactor coolant inlet temperature to a value corresponding to the reactor coolant outlet temperature, in compliance with the Order. Additionally, burnup conditions representative of Cycle 5 operations were used in the fuel rod analyses. Since all Westinghouse fuel contained in Cycle 5 and following is twice-burned, credit can be taken for the effect of burnup on peak clad temperature. A minimum fuel rod burnup of 11,456 MWD/MTU was used in the analyses. Steam generator tube plugging was assumed to be 6% in each steam generator, and minor corrections were made in containment heat sink data.

The uprated power level of 2300 MWt was again assumed in the analyses, along with a  $F_q$  value of 2.30. The results presented in the attachment for the 0.4C<sub>D</sub> (worst break) and 0.6C<sub>D</sub> Double Ended Cold Leg Guillotine (DECLG) breaks and the 1.0C<sub>D</sub> Double Ended Cold Leg Split (DECLS) break show that peak clad temperature remains below 2200°F and that the other requirements of Appendix K to 10CFR50 are satisfied.

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During preparation of the model for the current analyses, Westinghouse discovered that fluid systems information provided for the RHR pump flows was erroneous, in that broken line spillage to containment was not properly accounted for. This has been corrected in the analyses being submitted, and leads to a more conservative value for peak clad temperature than was provided in the earlier analyses. This correction has also been applied to the Exxon analyses and has been the reason for delaying the submittal of the analyses required by the Order, as discussed with your staff.

The Exxon analyses contained in Attachment II have had similar changes to the ones set forth above, in that steam generator tube plugging of 6%, the correct RHR flows, and reactor coolant outlet temperature for the upper head fluid were used. Additional changes to the evaluation model were made to represent the heat transfer regimes following the accident in accordance with the regulations and to use a phase-separation instead of a homogeneous model for fluid flow from the upper head region during the transient. The power level used in the analyses is 2300 MWt.

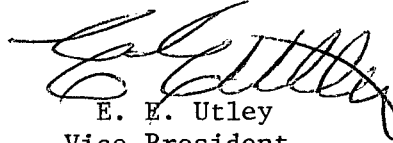
The value of  $F_q$  used in the Exxon analyses is 2.20, resulting from the effects of the upper head fluid model change and the error in RHR flow. The Exxon analyses are the Double Ended Cold Leg Split (DECLS) with a discharge of 8.24 ft<sup>2</sup> and two DECLG cases, with  $C_D = 1.0$  and  $C_D = 0.8$ . Also provided are the DECLG,  $C_D = 1.0$ , with no plugging of steam generator tubes to provide a sensitivity analysis to steam generator tube plugging, and the DECLG,  $C_D = 1.0$ , with the homogeneous model to provide assurance that the model change is conservative. The results show that, with a value of  $F_q = 2.20$ , the peak clad temperature limit of 2200°F is not exceeded. With this result, operations during Cycle 5 can continue at a power level of 2200 MWt with no revision of Technical Specifications, since the reduced (as compared to analyzed) power level allows a value of  $F_q = 2.30$ .

Attachment II includes a summary of key results (peak clad temperature, Zr-H<sub>2</sub>O reaction, location of break, etc.) for the breaks analyzed. Figures representing the variation of key parameters during each analyzed transient and other missing data are being prepared for submittal, and will be provided as soon as possible to complete documentation of the Exxon analyses.

It is our understanding that the Westinghouse analyses along with the Exxon analyses provide the information necessary to meet the requirements of the Order for Modification of License of August 27, 1976, and review of this submittal will not delay our scheduled startup, which is currently December 1, 1976.

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

Yours very truly,

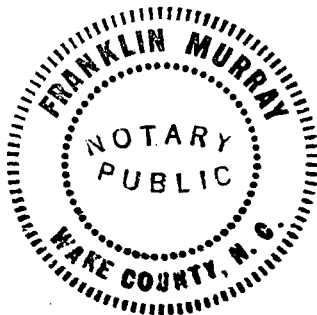


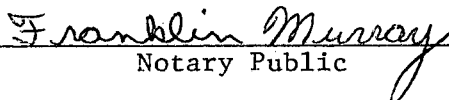
E. E. Utley  
Vice President  
Bulk Power Supply

MFP/dkm

Attachment

Sworn to and subscribed before me this 17th day of November, 1976.



  
Notary Public

My Commission Expires October 4, 1981