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 FACIL: 50-261 H.B. Robinson Plant, Unit 2, Carolina Power & Light Co 05000261  
 AUTH. NAME: AUTHOR AFFILIATION  
 CUTTER, A.B. Carolina Power & Light Co.  
 RECIP. NAME: RECIPIENT AFFILIATION  
 VARGA, S.A. Operating Reactors Branch 1

SUBJECT: Application to amend License DPR-23, revising Tech Specs to delete requirement re maint of highly borated water inventory in boron injection tank, per Generic Ltr 85-16, Proprietary XN-NF-85-17(P) encl. Rept withheld (ref 10CFR2.790). Fee paid.

*all subjects - XN-NF-85-17(P)* 3 ENCL 37 SIZE: 5+97  
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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  
REQUEST FOR LICENSE AMENDMENT  
BORON INJECTION TANK DILUTION

Dear Mr. Varga:

**SUMMARY**

In accordance with the Code of Federal Regulation, Title 10, Parts 50.90 and 2.101, Carolina Power & Light Company (CP&L) hereby requests a revision to the Technical Specifications (TS) for the H. B. Robinson Steam Electric Plant, Unit 2 (HBR-2). Per the recommendations of Generic Letter 85-16, "High Boron Concentrations", this amendment requests deletion of requirements regarding maintenance of a highly borated water inventory in the Boron Injection Tank (BIT) and the associated heat tracing required to maintain the high boron concentration in solution. Accident analysis has shown that an inventory of highly borated water in the BIT is not necessary to maintain an acceptable margin of safety to fuel failure during the postulated steamline break event. Furthermore, CP&L has evaluated the effects of this proposed change on the environmental conditions within the containment during the postulated steamline break and determined that the equipment's environmental qualification envelope would not be exceeded. Therefore, CP&L requests removal of the TS requirement for this highly borated water supply in order to eliminate the substantial maintenance and surveillance requirements involved in maintaining the inventory. This change will also eliminate the potential to block the Safety Injection Flow Path due to boron precipitation should the heat tracing fail or become damaged. A more detailed discussion of the TS changes, supporting justification, and significant hazards considerations is presented below. Revised versions of the affected TS pages are included as Enclosure 1 to this transmittal. Copies of the supporting analyses reports are also enclosed.

**DISCUSSION**

The enclosed Exxon Nuclear Company (ENC) report, "Analysis of the Steamline Break Event with Boron Injection Tank Removal or Dilution to Zero Concentration Boric Acid for H. B. Robinson Unit 2", documents the analysis performed to demonstrate that injection of highly borated water from the BIT is not necessary to maintain an acceptable margin of safety to fuel failure. This analysis is based upon the assumption that the BIT

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remains in place, but is filled with unborated water. In this configuration, the concentration of the borated water initially reaching the core is reduced. The report concludes that "the core return to power reaches a higher level and the resulting Minimum Departure from Nucleate Boiling Ratio (MDNBR) is lower than for the case with the BIT filled with highly borated water. However, the reduction in MDNBR is small and the margin to fuel failure remains large." Furthermore, "the power excursion will ultimately be terminated via injection of low concentration borated water . . . from the refueling water storage tank. If the fission power has not been reduced to zero by the time the auxiliary feedwater flow is terminated, the subsequent heatup of the primary with the resulting negative moderator and doppler feedback effects will augment the negative reactivity inserted from the boron to terminate the power excursion."

Carolina Power & Light Company has also considered the impact of the boron dilution on the environmental conditions within the containment during and following a postulated accident. The positive reactivity insertion associated with the boron dilution produces higher power in the core and a corresponding increase in the energy of the primary and secondary coolant. During the MSLB event, this increased secondary side energy will produce slightly more severe environmental conditions within the containment. The reanalysis of the MSLB event to reflect the elimination of the borated water inventory in the BIT also updated the original analysis with revised mass and energy release rate assumptions provided by WCAP-8822, "Mass and Energy Release Following a Steamline Rupture - September 1976," and various other vendor reports. The results of this study show that the containment conditions produced by the postulated MSLB would not result in component temperatures above the established environmental qualification limits. The major contribution to the increased containment temperature predicted by the analysis was due to the revised assumptions concerning mass and energy release rates. The consequence of the boron dilution on the containment environment conditions is very slight. A copy of this analysis report is enclosed.

A second option discussed in the Exxon analysis would involve physical removal of the Boron Injection Tank from the system. This approach would eliminate the dilution of the boron concentration in the core resulting from injection of the unborated contents of the BIT. Therefore, the reactivity inserted would be reduced and this condition would be bounded by the approach analyzed in the Exxon Report. Carolina Power & Light Company has elected to initially pursue the option which would leave the BIT in place. The boron concentration of the tank contents would be low enough to maintain the boron in solution at ambient temperatures. However, at some future time, CP&L may elect to physically remove the tank from the system. The TS changes presented herein allow pursuit of either option.

The proposed TS changes delete requirements and surveillances regarding the boron concentration in the BIT and the operability of the associated heat tracing. In addition, the proposed TS change deletes the BIT volume specification and tank level surveillance requirement. The piping system which includes the BIT will be maintained with water supplied from the Refueling Water Storage Tank (RWST). The static head pressure in the RWST will maintain the water in the BIT, and the BIT essentially can be considered as part of the piping system. Therefore, the flow to the RCS is not delayed by the tank fill time or excessive pressure drop through the empty tank.

Specific sections affected by the proposed change are itemized below:

- Section 3.3.1.1, item b, page 3.3-2 - Deletion of specification for volume, boron concentration, and temperature, in BIT and heat tracing on flow path.
- Section 3.3.1.2, items f and h, page 3.3-4 - Deletion of the shutdown action requirements associated with low boron concentration in BIT and deletion of heat tracing operability specification.
- Basis to Section 3.3, page 3.3-14 - Delete discussion of boron concentration in BIT and reference 9 (original analysis transmittal letter).
- Table 4.1-1, Item 16, page 4.1-6 - Delete BIT level surveillance.
- Table 4.1-2, item 5, page 4.1-10 - Delete boron concentration sampling test requirement.
- Table 4.1-2, note 5, page 4.1-11 - Delete requirement to check BIT concentration following any safety injection system actuation.

#### **SIGNIFICANT HAZARDS DETERMINATION**

Carolina Power & Light Company has reviewed this change request in accordance with the standards set forth in 10 CFR 50.92 and determined that the proposed license amendment involves no significant hazard considerations. The basis for this determination is presented below by addressing each of the significant hazards criteria established in 10 CFR 50.92.

##### **Criterion (1)**

*Operation of the facility in accordance with the proposed change would not involve a significant increase in the probability or consequences of an accident previously evaluated.*

##### **Response**

Carolina Power & Light Company has evaluated the impact of the proposed change on the existing accident analyses and determined that it would have no effect on the probability of occurrence of any previously evaluated accident. This is due to the fact that the boron concentration in the BIT is irrelevant to normal operating parameters crucial to the prevention of an accident and comes into play as a mitigation action only after the accident has begun.

As previously discussed, however, the concentration of the BIT does have some potential implications on the consequences of an accident. This impact is limited to or bounded by the conditions of the steamline break event. As demonstrated by the enclosed report, "Analysis of the Steamline Break Event with Boron Injection Tank Removal or Dilution to Zero Concentration Boric Acid for H. B. Robinson Unit 2" removal of the capability to inject highly borated water into the core does not produce a significant reduction in MDNBR when compared to the large margin to fuel failure which remains.

Carolina Power & Light Company has also considered the impact of boron dilution on the environmental conditions within the containment during and following a postulated accident. As discussed in the previous section and demonstrated by the enclosed report, MSLB event analysis has shown that the component temperatures are not significantly affected and remain within the established EQ limits. Based upon these analyses, Carolina Power & Light Company has determined that the changes requested herein do not increase the possibility of a previously analyzed accident or significantly increase the consequences thereof.

#### **Criterion (2)**

*Operation of the facility in accordance with the proposed change would not create the possibility of a new or different kind of accident from any previously evaluated.*

#### **Response**

The change to the plant involves elimination of the highly borated water inventory in the BIT. This allows the deletion of the requirements for the support equipment necessary to keep the high concentration of boron in solution (i.e., heat tracing, high concentration boric acid, recirculating piping to the BIT, etc.). The impact on the plant is limited to or bounded by the MSLB event which has been analyzed in detail as discussed in the response to Criterion 1 above. Furthermore, CP&L has determined that an inventory of unborated water in the BIT would not be sufficient to create any new, credible scenarios involving inadvertent boron dilution of the primary coolant. No new or different credible accident scenarios have been identified which could conceivably result from this change.

#### **Criterion (3)**

*Operation of the facility in accordance with the proposed change would not involve a significant reduction in the margin of safety.*

#### **Response**

As previously discussed, the proposed change would slightly reduce the MDNBR and the corresponding margin to fuel failure during operation of the Safety Injection System (SIS). However, the reduction is small in comparison to the remaining margin. In addition, the higher power excursion experienced during the main steamline break event would encroach upon the safety margin associated with the equipment environmental qualifications. Here again, CP&L has determined that the conditions are still within the defined equipment EQ component temperature envelope. Therefore, the proposed change would not significantly reduce either of these defined margins of safety.

#### **ADMINISTRATIVE**

The revised version of the TS pages affected by this request are included as an enclosure for your use. Copies of the analyses to support this request are also enclosed. Exxon considers the information in the enclosed report, XN-NF-85-17(P), to be proprietary. In accordance with the Commission's regulation 10 CFR 2.790(b), the enclosed affidavit executed by Dr. Richard B. Stout of Exxon provides the necessary information to support the withholding of the report from public disclosure.

In accordance with 10 CFR 170.12, a check in the amount of \$150 in payment of a license amendment application fee is attached.

If you have any questions concerning this request, please contact Mr. S. R. Zimmerman at (919) 836-6242.

Yours very truly,



A. B. Cutter - Vice President  
Nuclear Engineering & Licensing

ABC/MDM/ccc (1928MDM)

Enclosures

cc: Dr. J. Nelson Grace (NRC-RII)  
Mr. G. Requa (NRC)  
Mr. H. Krug (NRC Resident Inspector - RNP)  
Mr. Heyward G. Shealy (SC)  
Attorney General (SC)

A. B. Cutter, having been first duly sworn, did depose and say that the information contained herein is true and correct to the best of his information, knowledge and belief; and the sources of his information are officers, employees, contractors, and agents of Carolina Power & Light Company.

My commission expires: 11/27/89

  
Notary (Seal)

