Progress Energy

10 CFR 54

Serial: RNP-RA/03-0007

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United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23

RESPONSE TO NRC REQUEST 9 OF REQUEST FOR ADDITIONAL INFORMATION REGARDING SEVERE ACCIDENT MITIGATION ALTERNATIVES

Ladies and Gentlemen:

By letter dated June 14, 2002, Carolina Power & Light (CP&L) Company submitted an application for the renewal of the Operating License for the H. B. Robinson Steam Electric Plant (HBRSEP), Unit No. 2, also referred to as RNP.

By letter dated October 23, 2002, the NRC provided a request for additional information to CP&L regarding the Severe Accident Mitigation Alternatives analysis contained in the Environmental Report. The response to the request for additional information was provided by letter dated January 2, 2003. However, the response to NRC Request 9 was delayed as discussed in a telephone call between CP&L and NRC on December 23, 2002, and as documented in CP&L letter dated January 15, 2003. The purpose of this letter is to provide the response to NRC Request 9.

Attachment I provides an Affirmation pursuant to 10 CFR 50.30(b).

Attachment II provides the response to NRC Request 9 of the request for additional information regarding Severe Accident Mitigation Alternatives.

If you have any questions concerning this matter, please contact Mr. C. T. Baucom.

Sincerely,

Chuck Baucom for

B. L. Fletcher III
Manager - Support Services - Nuclear

Attachments:

I. Affirmation
II. Response to NRC Request 9 of Request for Additional Information Regarding Severe Accident Mitigation Alternatives

Progress Energy Carolinas, Inc.
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A001

JSK/jsk

c: Mr. T. P. O'Kelley, Director, Bureau of Radiological Health (SC) (w/o Attachments)
Mr. L. A. Reyes, NRC, Region II (w/Attachments)
Mr. C. Patel, NRC, NRR (w/o Attachments)
NRC Resident Inspectors, HBRSEP (w/o Attachments)
Attorney General (SC) (w/o Attachments)
Mr. S. K. Mitra, NRC, NRR (w/Attachments)
Mr. R. L. Emch, NRC, NRR (w/Attachments)
Mr. R. M. Gandy, Division of Radioactive Waste Management (SC) (w/o Attachments)

AFFIRMATION

The information contained in letter RNP-RA/03-0007 is true and correct to the best of my information, knowledge, and belief, and the sources of my information are officers, employees, contractors, and agents of Carolina Power and Light Company. I declare under penalty of perjury that the foregoing is true and correct.

Executed On: 20JAN03

Timothy P Cleary

T. P. Cleary
Plant General Manager, HBRSEP, Unit No. 2

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

RESPONSE TO NRC REQUEST 9 OF REQUEST FOR ADDITIONAL INFORMATION REGARDING SEVERE ACCIDENT MITIGATION ALTERNATIVES

NRC Request 9

"The RNP PRA does not utilize the Rhodes reactor coolant pump (RCP) seal LOCA model endorsed by the NRC. The use of this model could impact the risk from RCP seal LOCA events and the estimated benefits of associated SAMAs. Please discuss the RCP seal LOCA model used in the PSA and why this is judged to provide an appropriate representation of RCP seal LOCA events. Provide an assessment of the potential impact that use of the Rhodes model could have on the cost-benefit results for those SAMAs associated with RCP seal LOCAs. Also, provide an estimate of when RCP seals constructed of improved materials will be installed on pump "A" (see Phase 1 SAMA 14)."

CP&L Response

Based on information contained within WCAP-15603, "WOG2000 Reactor Coolant Pump Seal Leakage Model for Westinghouse PWRs," Revision 1, Carolina Power & Light (CP&L) Company understands that the Rhodes model differs from the RNP Current Licensing Basis (CLB) and the current RNP Probabilistic Safety Assessment (PSA) RCP seal model. The Rhodes model uses a less conservative spectrum of seal failure modes, resulting leakage rates, and core uncovery times for high temperature O-rings when compared to the NUREG/CR-4550 model for the case involving older type O-rings. Additionally, the Rhodes model conservatively assumes no time delay from the initial loss of RCP seal cooling to the onset of RCP seal failure. For example, the Rhodes model includes a high leakage failure mode (i.e., "popping") that occurs at the onset of the loss of RCP seal cooling with a high probability of occurrence (e.g., 20%).

The current RNP RCP seal model, based on the original interpretation of NUREG/CR-4550 for older type O-rings, is representative of the current licensing basis in that it reflects the plant-specific actions that RNP has committed to and that are approved by the NRC, especially in regard to Station Blackout and 10 CFR 50, Appendix R. Specifically, the PSA model assumes that restoration of seal cooling within 90 minutes of the loss of AC power, in accordance with plant procedures, will prevent excess seal leakage. The PSA model also credits the dedicated shutdown diesel generator, the use of which is prescribed within plant procedures. Therefore, application of the Rhodes model assumptions to the RNP PSA model without corresponding modifications to RNP, and

without corresponding modifications to RNP CLB commitments, would not be appropriate and would not provide valid risk insights.

When compared to the current RNP PSA model, adopting the Rhodes model assumptions for RCP seal leakage rates and probabilities would be expected to lower the safety benefit of RCP seal-related SAMAs, since increased time would be available for restoration of offsite power to mitigate an RCP seal Loss of Coolant Accident (LOCA).

It is not clear whether the Rhodes model assumption that binding and popping failures start at the beginning of the scenario is used to simplify the calculations, or whether it represents expected seal behavior. If it represents expected RCP seal behavior, then the time available to prevent or mitigate the event by restoration of offsite power would be reduced, which would effectively eliminate the capability to credit restoration of seal cooling using the dedicated shutdown diesel generator. This failure mode (i.e., immediate, large) could not be prevented or mitigated by the RNP dedicated shutdown diesel generator due to the timing and high leak rates. The overall impact would be to increase the safety benefit of RCP seal-related Severe Accident Mitigation Alternatives (SAMAs), because of the reduction in credit taken for mitigating actions.

The evaluation of SAMAs in conjunction with the use of the Rhodes model would include the costs of modifications to RNP and to RNP's CLB commitments to match the assumptions of the model.

One of the findings of the Peer Certification Review of the RNP PSA recommends the evaluation of use of an upgraded RCP seal model. This recommendation has been entered into the CP&L Corrective Action Program and will be evaluated and dispositioned in accordance with Company procedures. As part of this action, CP&L will determine if any insights obtained from the Rhodes model are appropriate for inclusion in the long-term maintenance of the RNP PSA model.

RNP recognizes the importance of the risk posed by postulated RCP seal LOCAs. In this regard, RNP has installed high temperature O-rings in two of the three RCPs. Installation of the high temperature O-ring in the third RCP is planned for Refueling Outage 22, which currently scheduled for spring 2004.