UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

ENCLOSURE 1

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATING TO HIGH BURNUP IRRADIATION OF A

DEMONSTRATION ASSEMBLY

CAROLINA POWER & LIGHT COMPANY

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

DOCKET NO. 50-261

1.0 INTRODUCTION

By letter dated March 15, 1993, Carolina Power & Light Company (CP&L or the licensee) submitted a request for the continued irradiation of a demonstration assembly to be loaded into the core at H. B. Robinson Steam Electric Plant, Unit No. 2 (HBR2) for Cycle 16. The demonstration assembly is manufactured by Siemens Power Corporation and will be irradiated to a high burnup that exceeds the current licensed limit of 62,000 MWD/MTU peak rod. The licensee has determined that continued irradiation in Cycle 16 will constitute an unreviewed safety question because the projected burnup will exceed the NRC approved limit. The licensee provided analysis to justify the continued irradiation of the demonstration assembly. Our evaluation follows.

2.0 EVALUATION

The licensee analyzed the demonstration assembly in all aspects of safety concerns including neutronic, mechanical, thermal hydraulic, transient, and accident analyses. The estimated burnup at the end of Cycle 16 is approximately 69,000 MWD/MTU peak rod. The licensee concluded that the results of extrapolating beyond the NRC-approved burnup limit using the approved methodologies support the safety of the planned irradiation of the demonstration assembly in reactor service. Inasmuch as this assembly is a test assembly, the data from this assembly will be used to achieve improved performance for future fuel design applications. We conclude that the licensee has provided adequate assurance of safety for the proposed use of this assembly in HBR2 for Cycle 16.

The staff considers this demonstration assembly as a lead test assembly (LTA). In general, there are two criteria governing the use of LTAs: (1) the total number of demonstration assemblies in one core should be limited, and (2) the demonstration assemblies should not be loaded in limiting positions. The licensee's demonstration program conforms to these criteria. We, thus, conclude that this demonstration assembly is acceptable for Cycle 16 at HBR2.

3.0 CONCLUSION

We have reviewed the licensee request for continued irradiation of a demonstration assembly for HBR2 Cycle 16. Based on the NRC staff evaluation, we conclude that there are no safety concerns and we approve the use of the demonstration assembly to high exposure exceeding the current licensed limit of 62,000 MWD/MTU for HBR2 Cycle 16.

The staff has concluded, based on the consideration discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations.

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