



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

SAFETY EVALUATION BY THE  
OFFICE OF NUCLEAR REACTOR REGULATION  
SUPPORTING AMENDMENT NO. 11 TO  
FACILITY OPERATING LICENSE NO. R-95  
RHODE ISLAND AND PROVIDENCE PLANTATIONS  
ATOMIC ENERGY COMMISSION  
RHODE ISLAND NUCLEAR SCIENCE CENTER REACTOR  
DOCKET NO. 50-193

Introduction

By letter dated September 15, 1982, the Rhode Island and Providence Plantations Atomic Energy Commission (the licensee) requested changes to Section E of Appendix A Technical Specifications, of Facility Operating License No. R-95. The proposed changes would allow the use of graphite reflectors that are slightly different from those that are currently being used in the Rhode Island Nuclear Science Center (RINSC) reactor.

Evaluation

The licensee has experienced difficulties in replacing defective graphite reflectors in the RINSC reactor. Neither the original grade graphite nor the aluminum reflector cladding of the original thickness are readily available at this time. These changes will allow the licensee to utilize graphite reflectors of recent fabrication in the RINSC reactor without any impact on reactor safety.

The changes to Section E.1, Principal Core Materials, will allow the use of any graphite the equivalent of AGOT. AGOT is a designation which was in common usage when the original reflectors were fabricated some twenty years ago. At present, graphite with characteristics comparable to AGOT are available with different designations. Currently, graphite called "nuclear grade 2" is available with characteristics comparable to AGOT, which could be used in the RINSC reactor.

The changes to Section E.3, Reflector Elements, will make it possible to utilize standard size extrusions of aluminum for the fabrication of the can, or cladding which surrounds the graphite. No change will be made in the outside dimensions and shape of the reflector element. The dimension change is an increase in the wall thickness of the aluminum can (from 0.04 in to 0.1 in) which surrounds the graphite and a corresponding decrease (from 2.9 in to 2.8 in) in the cross-section dimension of the graphite. This will create no significant difference in the performance of the reflector element(s) for the following reasons:

- The center line temperature of a reflector with the thicker clad will be the same or lower than the center line temperature of a reflector with the thinner (original) clad. This is because aluminum has a larger coefficient of thermal conductivity than the graphite it replaces and because the heat generation source terms do not substantially change.
- The increased amount of aluminum between the reactor core and the graphite reflector will have a negligible effect on the nuclear characteristics of the overall core. Because the aluminum has a higher neutron absorption cross-section than the graphite it replaces, the overall effect will be one of a slight decrease in the reactivity worth of a reflector because of a small increase in absorption of thermal neutrons.
- The strength of the aluminum cladding of the reflector element will be greatly improved by the increase in thickness.

#### Environmental Consideration

The staff has determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, the staff has further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR Section 51.5(d)(4), that an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

#### Conclusion

The staff has concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: OCT 18 1982