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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 8 TO AMENDED FACILITY LICENSE NO. R-63

NORTH CAROLINA STATE UNIVERSITY

DOCKET NO. 50-111

Introduction

By letter dated December 10, 1979, as supplemented by letters dated January 4 and February 5, 1980, the North Carolina State University (NCSU) requested an amendment to License No. R-63 for the NCSU 10 kilowatt Training and Research Reactor. NCSU proposed revision of building and campus monitoring requirements and the deletion of weekly inspections of the reactor and its control apparatus.

Evaluation

The NCSU Training and Research Reactor was shutdown on February 16, 1973, and all fuel and source material has been removed from the reactor facility. All irradiated fuel assemblies have been shipped to the Department of Energy Savannah River Plant in Aiken, South Carolina. The four remaining fuel assemblies (unirradiated) have been transferred to the NCSU PULSTAR reactor facility for storage (License No. R-120). Amendment No. 6 to License No. R-120 dated September 7, 1980, authorizes storage of these four fuel assemblies at the PULSTAR reactor facility. By this amendment we are amending License No. R-63 to delete previous authorization to possess Uranium-235 and the plutonium-beryllium neutron sources.

All water has been drained from the reactor system and residual activation products remain in the reactor grid structures and the biological shield. The biological shield is sealed with a steel plate and locks. The present license (R-63) allows NCSU to possess but not operate the reactor.

NCSU has requested the deletion of building monitoring with the fixed monitoring system, campus monitoring with thermoluminescent dosimeters and weekly inspections of the reactor and control apparatus. By letter dated February 5, 1980, NCSU agreed to add requirements for quarterly radiation surveys and inspection of the reactor facility. Therefore, these requirements are being added to License No. R-63 by this amendment.

The building monitoring system consists of: 1) fixed beta-gamma geiger counters and ionization chambers in the reactor building, 2) a geiger counter and recorder for exhaust air from the reactor building, and 3) gamma counters for waste water holdup tanks. All three building monitoring subsystems activate alarms upon exceeding preset values.

We have determined that these three systems may be taken out of service because there is no fuel at the reactor facility, the reactor system is dry and adequate controls are maintained on residual activation. The remaining activity is primarily in the form of activated reactor components and concrete shielding. The minor amount of contamination on the reactor pool walls is adequately sealed with a steel cover over the reactor tank and seals on all beam ports and thermal columns. We have established Technical Specifications to assure that these seals remain in place except when work on the reactor tank or components is in progress under the supervision of a qualified health physicist. In addition, the licensee will perform radiation surveys of the reactor building on a quarterly basis.

Campus monitoring with thermoluminescent dosimeters may be deleted because the residual activity is primarily in fixed activation of reactor components and concrete and is, therefore, not easily transferable to the environment. Also, the quarterly surveys in the reactor building would detect any unlikely transfer of radioactivity from the sealed, dry reactor system.

The weekly inspection of the reactor and the reactor control apparatus is not necessary because there is no fuel at the facility and the system is dry. Therefore, there is no possibility of a safety problem for the public due to damage to the reactor or reactor control systems.

Environmental Consideration

We have determined that this amendment will not result in any significant environmental impact and that it does not constitute a major Commission action significantly affecting the quality of the human environment. We have also determined that this action is not one of those covered by 10 CFR §51.5(a) or (b). Having made these determinations, we have further concluded that, pursuant to 10 CFR §51.5(d)(4), an environmental impact statement or environmental impact appraisal and negative declaration need not be prepared in connection with issuance of this amendment.

Conclusion

We have 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: December 24, 1980