



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

ENVIRONMENTAL IMPACT APPRAISAL

SUPPORTING ORDER AUTHORIZING DISMANTLING OF  
FACILITY AND DISPOSITION OF COMPONENT PARTS

NORTH CAROLINA STATE UNIVERSITY

DOCKET NO. 50-111

Introduction

By letter dated June 5, 1980, as revised by letters dated February 19 and March 27, 1981, the North Carolina State University (the licensee) applied for authorization to dismantle the 10 Kw Research and Training Reactor (the facility), dispose of its component parts, and terminate the facility license. This evaluation deals with those features and characteristics of reactor dismantling and disposition of component parts which may affect the environment.

Discussion of Facility Dismantling

The facility is a 10 Kw, graphite reflected, pool-type reactor that used MTR-type fuel elements. The core lattice is a 5x5 array of 21 fuel assemblies and 4 graphite assemblies. The reactor was operated from 1960 to 1973. Operations were then terminated and License No. R-63 amended to "Possess-but-not-operate" status.

All fuel has been removed from the reactor facility. The irradiated fuel has been shipped to the Department of Energy (DOE) Savannah River Plant for reprocessing. The remaining fuel, 4 unirradiated fuel assemblies, have been transferred to the licensee's PULSTAR reactor facility for dry storage. Amendment No. 6 dated September 17, 1980, to License No. R-120 authorized the transfer of the 4 unused fuel assemblies to the PULSTAR reactor. These 4 assemblies will remain at the PULSTAR facility until they are shipped to another licensed reactor facility for reuse or to a Federal reprocessing facility.

The facility accumulated a total of 52.5 megawatt hours of operation. Calculations by the licensee indicate that the total residual activity in all reactor components and structures is less than 0.5 curies.

Environmental Considerations

Radioactive material produced during the dismantling process will be sent to a licensed burial ground. The reactor will be dismantled in accordance with the licensee's dismantling plan, as revised. Dismantling will consist primarily of removal of activated reactor internal components, beam tubes and the pool liner. Only minor decontamination effort is expected because of the low level of activity in the cooling water during reactor operation. If any decontamination liquids are generated they will be handled in accordance with 10 CFR Part 20 requirements and procedures presently in existence at the adjacent PULSTAR reactor. All reactor systems of the 10 Kw reactor are now dry, hence there are no existing liquids for disposal.

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The licensee proposed to remove all byproduct materials, radioactive wastes and radioactive components to reduce radiation to levels acceptable for release to unrestricted access. Radioactivity will be removed to the levels specified in our letter of March 6, 1981 to the licensee. The facility may be renovated following removal of radioactive material, or the major structures including the reactor building may be removed to make room for a new building. In either event, the site will be returned to productive use by the University.

Therefore, dismantling will cause no significant environmental impact because of the low residual activity and the controls established. The facility will be released for unrestricted use following dismantling and inspection by the NRC.

#### Alternatives to Dismantling of Reactor and Disposal of Components

The reactor has not been used for 8 years and is of no present or future use to North Carolina State University. It occupies space which can be used by the licensee for other purposes. There are no reasonable alternatives to dismantling.

#### Long Term Effects of Dismantling and Disposal of Reactor Components

Upon removal of reactor components, the reactor facility rooms can be used for other purposes or the reactor building can be removed and the space used for a new University building. The reactor fuel will be used at another research reactor or reprocessed at the DOE Savannah River Plant. Reactor components that are radioactive will be disposed of as radioactive waste. Nonradioactive reactor components will be scrapped except for parts that can be put to use in other projects by the licensee.

#### Costs and Benefits of Reactor Dismantling

The costs of dismantling the facility and disposal of its components is estimated to be about \$60,000. The licensee has not been able to sell the reactor during the eight years it has been shutdown. Its disposal as scrap materials is therefore preferable to its remaining in its present status where it serves no useful purpose. No benefits would be served by not dismantling the reactor.

#### Conclusions

We conclude that there will be no significant environmental impact associated with the dismantling of the facility and disposal of its component parts, and that no environmental impact statement is required to be written for dismantling of the facility and disposal of the component parts.

Dated: June 1, 1981