

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



SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING ORDER AUTHORIZING DISMANTLING OF FACILITY AND DISPOSITION OF

COMPONENT PARTS

WEST VIRGINIA UNIVERSITY

AGN-211P REACTOR

DOCKET NO. 50-129

Introduction

By application dated September 27, 1979, as supplemented November 30, 1979, the West Virginia University (the licensee) requested authorization to dismantle the AGN-211P (Serial No. 103) Reactor and dispose of its component parts in accordance with its dismantling plan.

Discussion

The AGN-211P Reactor is a small research reactor designed to operate at a maximum power of 75 watts. The reactor core consists of a matrix array of 12 fuel elements that are surrounded by 30 graphite reflector elements. The fuel and graphite elements are held vertically in a steel grid plate. The entire core is situated at the bottom of a ten-foot deep water-filled tank. The fuel elements consist of 20% enriched  $UO_2$  pellets fused in a polyethylene moderator. The total fuel loading is 800 grams of U235.

All fuel has been removed from the reactor and is now stored onsite in the locked shielded "Isotopes Storage Vault" in three separate steel containers. The Ra-Be neutron startup source is stored in the Isotopes Storage Vault in a water-filled drum. The fuel assemblies were surveyed when removed from the core. Surface contamination was determined to be less than 1000 dpm/100  $cm^2$  (removable) and activation of 4 MR/hr or less at 1 cm. The startup source will be transferred to a Department of Transportation (DOT) approved shipping container and remain in the Isotopes Storage Vault until shipped offsite.

Pool water measurements show activity levels consistent with tap water with no detectable activity associated with reactor operations. Control rods, safety rods, guide tubes and other components removed from the reactor structure show no detectable activation or contamination.

Evaluation

The licensee proposes to transfer reactor pool water (not radioactive) to the storm drains, to disassemble the reactor components and to remove those components, the reactor tank and concrete shield blocks from the reactor room.

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Usable components, which may be transferred to another university, will be decontaminated, if necessary, and stored in the Isotopes Storage Vault. Non-usable components will be decontaminated, if necessary, and disposed of as scrap. Disposable components are the graphite thermal column, steel water tank and concrete shield blocks.

Radioactive contamination and activation of reactor components are expected to be at or near background because fuel elements exhibited very low contamination and the stainless steel control rod blades and other components that were removed exhibited no detectable contamination or activation. All work will be accomplished under the supervision of the University Radiation Safety Office. Releasing the pool water to the storm drains is acceptable since the pool water has been shown to be free from radioactive contamination.

The licensee proposes to store the fuel, the startup source and usable reactor hardware in the Isotopes Storage Vault until they are shipped to another authorized licensee. If the fuel, startup source and reactor components are not shipped to another licensee, the fuel and startup source will be shipped to the Oak Ridge National Laboratory. Other reactor components would be either used at the University for non-nuclear related activities or scrapped if not sent to another licensee for reuse in a reactor. Components that are put to use in non-reactor operations will be surveyed for contamination and activation. The licensee will assure that contamination of all components put to other use or disposed of as scrap is less than values given in Regulatory Guide 1.86 and that activation is not above natural background.

The physical security plan will remain in effect until the fuel is shipped offsite.

Following completion of the dismantling activities, the NRC will inspect the facility to confirm that it has been dismantled in accordance with the dismantling plan.

#### Conclusion

We have concluded, based on the considerations discussed above, that dismantling the AGN-211P Reactor and disposing of component parts as described in the dismantling plan will not be inimical to the common defense and security or to the health and safety of the public.

Dated: January 22, 1980

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