



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 16 TO

FACILITY OPERATING LICENSE NO. R-66

UNIVERSITY OF VIRGINIA

DOCKET NO. 50-62

1.0 INTRODUCTION

By letter dated July 2, 1987, as supplemented, the University of Virginia (UVA) requested changes in the Technical Specifications of Facility Operating License No. R-66 for the University of Virginia Reactor (UVAR). These changes would add to the Technical Specifications the following limitations on the use of cobalt-60 rod sources in the UVAR pool: (1) a minimum distance for storage and usage of the rod sources of five feet from the operating reactor, (2) irradiation facilities shall be designed to prevent physical damage to the rod sources, and (3) the reactor pool water will be checked monthly (interval not to exceed six weeks) for cobalt-60 to assure that substantial leakage from the rod sources to the reactor pool does not occur.

2.0 BACKGROUND

Amendment No. 8 was issued to Facility Operating License No. R-66 on August 4, 1971 authorizing the possession, storage and use in the UVAR pool of 70,000 Curies of cobalt-60 in the form of encapsulated rod sources. In letters to the Commission dated July 21, 1971, July 23, 1971, and July 28, 1971 the licensee committed to limitations on the use of the cobalt rod sources. These limitations were, (1) the cobalt-60 sources will be kept at a lateral distance of at least five feet from the reactor and stored under at least 20 feet of water, and (2) the reactor pool water will be sampled for cobalt-60 at intervals not to exceed 40 days. However, these limitations were not specifically addressed in the Technical Specifications at the time of the 1971 license amendment. This amendment formally adds to the Technical Specifications limitations on the use of the cobalt rods sources in the UVAR reactor pool.

3.0 EVALUATION

The cobalt rods are used and stored at least five feet from the operating reactor. This is not a new requirement. This will prevent neutron activation damage to the double encapsulation which consists of a stainless-steel jacket and an aluminum jacket. Because usage and storage will be consistent with the requirements of 10 CFR Part 20 and the

concept of ALARA, the requirement to store the sources under at least 20 feet of water is restrictive and does not enhance safety. This requirement is not carried over into the Technical Specifications. Irradiation facilities that will use the cobalt rods will be designed to prevent physical damage. This is a new requirement to ensure that the sources are used in a safe, conservative manner. To assure that the cobalt rods have not suffered any cladding failure, the reactor pool water will be analyzed on a monthly frequency (interval not to exceed six weeks) for cobalt-60. This represents an increased frequency of sampling over the previous 40 day interval because the new average is one month. The six week interval allows for operation flexibility. The existing limits on pool pH and conductivity assure that corrosion of the rods is minimized. If the cobalt-60 concentration of the reactor pool water exceeds the concentrations for restricted areas given in 10 CFR 20, Appendix B, Table 1, this will be considered a reportable event by the Technical Specifications and the NRC will be notified in accordance with the Technical Specifications. This is a new requirement to ensure that rod failure is quickly brought to the attention of the Commission.

Accidents were considered in the 1971 submittal. It was determined that the cobalt rod cladding would remain intact in the event of a loss of pool water accident and that the radiation fields in the reactor building during this accident would not be noticeably increased by the presence of the cobalt over that of the reactor core. These conclusions are still valid and do not change.

#### 4.0 ENVIRONMENTAL CONSIDERATION

This amendment involves changes in the installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and changes in inspection and surveillance requirements. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and there is no significant increase in individual or cumulative occupational radiation exposure. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no Environmental Impact Statement or Environmental Assessment need be prepared in connection with the issuance of this amendment.

#### 5.0 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 evaluated, or create the possibility of a new or different kind of accident from any accident previously evaluated, and does not involve a significant reduction in a margin of safety, 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 the proposed activities, 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 the health and safety of the public.

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Dated: April 25, 1988