UNIVERSITY OF VIRGINIA
DEPARTMENT OF NUCLEAR ENGINEERING AND ENGINEERING PHYSICS
NUCLEAR REACTOR FACILITY
SCHOOL OF ENGINEERING AND APPLIED SCIENCE
CHARLOTTESVILLE, VA 22901

Telephone: 804-924-7136

June 22, 1984

Cecil O. Thomas, Chief
Standardization and Special Projects Branch
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Request for renewal of the University of Virginia CAVALIER training and research reactor, Operating License No. R-123.

Dear Mr. Thomas:

I request the renewal of the University of Virginia's Operating License No. R-123 Docket No. 50-396, for the CAVALIER training and research reactor. I request this renewal be for a twenty year license period effective from the date of issuance of the renewal. The information requested in your February 6, 1984 letter is provided below.

1. Updated or Revised Safety Analysis Report (SAR)

An updated Safety Analysis Report is enclosed. This report has been reviewed and approved by our Reactor Safety Committee. Currently, there are no plans to change any of the structures or operating characteristics associated with the CAVALIER reactor during the requested renewal period.

2. Financial Qualifications to Continue Operation (10 CFR 50.33(f)).

The CAVALIER reactor is operated by the University of Virginia, an agency of the State of Virginia, in support of its assigned educational and research mission. Enclosed is a copy of the 1982-1983 Financial Report of the University of Virginia. Also enclosed is a statement from the School of Engineering and Applied Science Budget Officer detailing the annual cost of reactor operation, and the source and availability of these funds in the future.

The cost of shutting down the CAVALIER and safely disposing of the components is minimal in that all the fuel elements and control rods used in the CAVALIER are identical to those used in the UVAR, operating License No. R-66 which was licensed for a 20 year period beginning September 30, 1982. It is anticipated that all fuel elements and control rods used in the CAVALIER would be transferred to the UVAR for further utilization should the decision be made to shut down the CAVALIER.

The CAVALIER is operated at thermal powers of less than 60 watts with maximum thermal neutron flux of approximately 10^8 neutron/cm^2-sec and a limit on the maximum integrated power of 200 watt-hr/day. Thus,

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buildup of fission products in the fuel elements and activation of the core grid plate, structural components, and instrumentation is minimal. For example, dose measurements made in June 1984, indicate that after almost 10 years of CAVALIER operation, the grid plate and core support structure produce a dose rate of less than 10 mR/hr on contact. It is anticipated that the nuclear instrumentation associated with the CAVALIER would be utilized in conjunction with the UVAR or the Nuclear Engineering Laboratory should the CAVALIER be shut down.

All grid plate and structural support materials which have been activated at these low levels would either be utilized in the UVAR operation facilities or disposed of via the University's existing low level radioactive waste disposal program. The estimated cost for disposal would be less than $2000 and such funds would be obtained from the UVAR and CAVALIER operating budgets.

3. Environmental Data and Discussion

The CAVALIER is housed in the same building (the Nuclear Reactor Facility) which contains the 2 MW UVAR. All information detailing the Reactor Facility building and surrounding site presented in Safety Evaluation Report NUREG-0928 is applicable for the CAVALIER. There are currently no plans to modify the existing Reactor Facility building or site.

The CAVALIER is licensed to operate at thermal powers less than 100 watts. Administrative controls limit operations to powers below 60 watts. The amount of argon-41 released when the reactor is operated at full power of 60 watts is negligible. The reactor is housed in a tank below ground level containing approximately 2000 gallons of deionized water. The core is cooled by natural convection. The limit on integrated power of 200 watt-hr/day insures that the amount of waste heat produced is negligible and easily dissipated. Fueled experiments are limited to experiments generating less than 1 watt of thermal power with a limit on the total exposure of not greater than the equivalent of 6 years continuous operation at 100 watts. No significant levels of radioactive materials (other than fission products in the fuel) are normally produced in the CAVALIER.

4. Technical Specifications and License Format

A revised copy of the CAVALIER Technical Specifications is enclosed. These specifications have been reviewed and approved by our reactor safety committee. Revisions have been made in accordance with ANSI/ANS 15.1 (1982) guidelines.

5. Operator Requalification Program

A copy of the currently approved and implemented operator requalification program is enclosed.

6. Emergency Plan

The NRC has recently requested additional information and details for the proposed University of Virginia Emergency Plan. It is

anticipated that this information will be submitted by the requested deadline.

7. Physical Security Plan

No changes to the existing physical security plan are requested at this time.

I am also forwarding 11 additional copies of this letter and all enclosures under separate cover. Should you require any additional information or explanation of the enclosures, please contact either J.P. Farrar or R.U. Mulder at 804-924-7136. Thank you for your consideration and cooperation in this matter.

Sincerely,

J.S. Brenizer, Director
Nuclear Reactor Facility

JSB:vs

Enclosures

Sworn to and subscribed before me this 22nd day of June, 1984.
Witness my official seal.
Notary Public

My Commission Expires October 14, 1985.