



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

August 19, 1985

Telephone: 804-924-7136

Director, Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555  
Attention: Document Control Desk

Re: Docket No. 50-396  
License No. R-123

Gentlemen:

The operating license for the University of Virginia CAVALIER reactor, License No. R-123 was renewed by your office on May 17, 1985. The Technical Specifications for the CAVALIER reactor was amended several years ago to allow two different types of fuel elements in the reactor, a flat plate (12 fuel plate) element or a curved plate (18 fuel plate) element.

This is to inform you as required by Technical Specification 6.6.1.4, that the CAVALIER reactor was recently loaded with curved plate elements. Although these same type of elements have been operated in our 2MW UVAR reactor, License No. R-66, for 10 years, this is the first time they have been used in the CAVALIER reactor. A series of measurements were made after the reactor was loaded to determine the power calibration, control rod worth, shutdown margin and excess reactivity. These measurements were completed on June 17, 1985 and the results are summarized below.

A) Power Calibration

Linear channel reading of 100 millivolts = 1 watt reactor power.

B) Rod Worth

Rod #	Total Worth (% $\Delta k/k$ )
1	0.811
2	0.848
3	0.818
4	0.927

C) Shutdown Margin and Excess Reactivity

Shutdown margin with Rod #4 withdrawn = 1.47%  $\Delta k/k$   
Total shutdown margin = 2.40%  $\Delta k/k$   
Excess reactivity = 1.01%  $\Delta k/k$

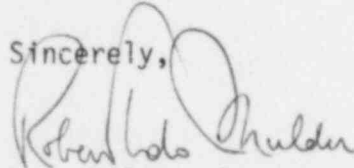
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Attached is a core loading diagram for your information. We anticipate that this loading will remain in the reactor for the foreseeable future.

Sincerely,

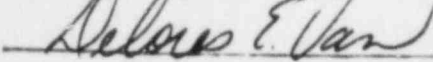
  
R.U. Mulder, Director

cc: Regional Administrator  
U.S.N.R.C. Region II  
101 Marietta Street N.W.  
Atlanta, Georgia 30323

Sworn to and subscribed before me this 21st.

day of August, 1985

Witness my hand and official seal.

 Notary Public

My Commission Expires October 14, 1985

# CAVALIER REACTOR LOADING CHART

Loading No. CAV-6

Date June 17, 1985

Total Mass 2639 gram U-235

F - Normal Fuel Element  
P - Partial Fuel Element  
C - Control Rod Fuel Element  
E - Removable Plate Fuel Element

Excess Reactivity 1.01%  $\Delta k/k$

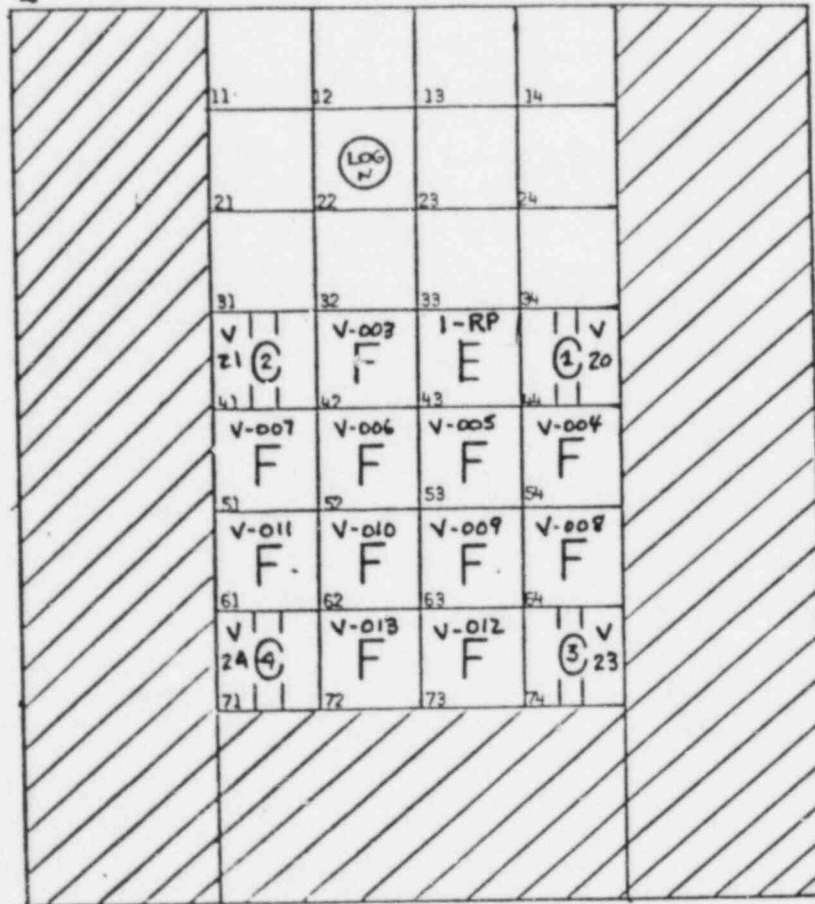
Shutdown Margin 1.47%  $\Delta k/k$

Rod #4 Withdrawn

AL Wire Mesh

Rod Worths  
(6-17-85)

#1 0.811%  
#2 0.848%  
#3 0.818%  
#4 0.927%



FUEL ELEMENT 1-RP HAS ONLY 10 FUEL PLATES

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