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April 6, 1998

Mr. Alexander Adams, Jr.  
Senior Project Manager  
Non-power Reactors and  
Decommissioning Project Directorate  
U.S. Nuclear Regulatory Commission  
M.S. 0-11-B-20  
Rockville  
MD  
20852-2738

Subject: Request for additional information (TAC No. MA1069) regarding the University of Virginia Reactor "UVAR" (Docket No. 50-62, License R-66) and the U.Va. "CAVALIER" (Docket No. 50-396, License R-123) Technical Specification Amendment Requests.

Dear Mr. Adams:

We offer the following in answer to the NRC's request for additional information:

NRC Question 1:

- a) Please explain the elimination of the Dean of the School of Engineering and Applied Science (SEAS) from the organizational structure and,
- b) the replacement of the Associate Provost for Research with the Vice Provost for Research.
- c) Why will the requested changes result in no reduction in the attention given by the University to safe and regulatory-compliant facility operation?

*U.Va.:*

- a) The U.Va. Provost and SEAS Dean have agreed that the UVAR Facility should be considered a university resource and, as such, the responsibility for its future management and operation more properly rests with the Provost's Office, which has a greater access to resources.*
- b) The title of Associate Provost for Research has been changed to Vice Provost for Research. Therefore, this is simply a change in title and not an administrative change.*
- c) Following the approval of the revised Technical Specifications, the Reactor Director will report to the Provost's Office, which is administratively at a higher level than the Nuclear Engineering Department or the School of Engineering. It can be concluded that the supervisory attention given to nuclear operations would henceforth be at the same level, and perhaps higher than at present.*

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NRC Question 2:

Please explain why UVAR TS 6.1.1 and 6.2.1 which refer to the Chair of the Department of Mechanical, Aerospace and Nuclear Engineering have not been submitted with the amendment request.

*UVA: Revisions to these TS should have been submitted with the original submittal but were not due to our oversight. Please find the relevant and revised UVAR and CAVALIER TS enclosed.*

NRC Question 3:

Please consider updating (UVAR) TS 6.7 (and CAVALIER TS 6.6) to reflect the transfer of NRC responsibility for the non-power reactor inspection program from Region II to the Non-Power Reactors and Decommissioning Project Directorate at NRC Headquarters. Notification of and submission of reports to Region II is no longer required.

*U.Va.:*

*Please find in attachment the pertinent UVAR and CAVALIER proposed TS with the NRC requested updates.*

NRC Question 4:

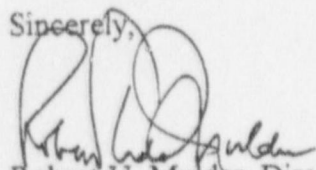
Do your proposed administrative changes affect the license or decommissioning order for the CAVALIER Research Reactor? If so, please submit an application for the amendment of the CAVALIER license.

*U.Va. :*

*The NRC has issued a decommissioning order for the CAVALIER. Until its license has been terminated, administrative changes such as those proposed for the UVAR TS must also be made to the CAVALIER TS, in parallel. Please find included in this submittal proposed modifications to CAVALIER TS which are essentially identical to those proposed for the UVAR license. Also included are proposed changes to pertinent pages in the CAVALIER Decommissioning Plan and its NRC Decommissioning order which would be affected by the requested organizational change.*

We will be happy to provide additional information or clarification should that become necessary.

Sincerely,



Robert U. Mulder, Director  
U.Va. Reactor Facility &  
Assoc. Prof. of Nuclear Eng.

City/County of Albemarle  
Commonwealth of Virginia

I hereby certify that the attached document is a true and exact copy of a letter presented before  
(type of document)

me this 7<sup>th</sup> day of April, 1998  
by Robert Mulder  
(name of person seeking acknowledgement)

cc: Mr. Craig Basset, NRC Region II, Atlanta, Ga.  
Document Control Desk, NRC, Washington, D.C. ✓

Victor A. Thomas  
Notary Public

My commission expires 2/28 192002

Figure 6.1 Organizational Structure of the  
U.Va. Research Reactor Facility

This revision is a replacement for page 46  
of the UVAR Tech. Specifications.

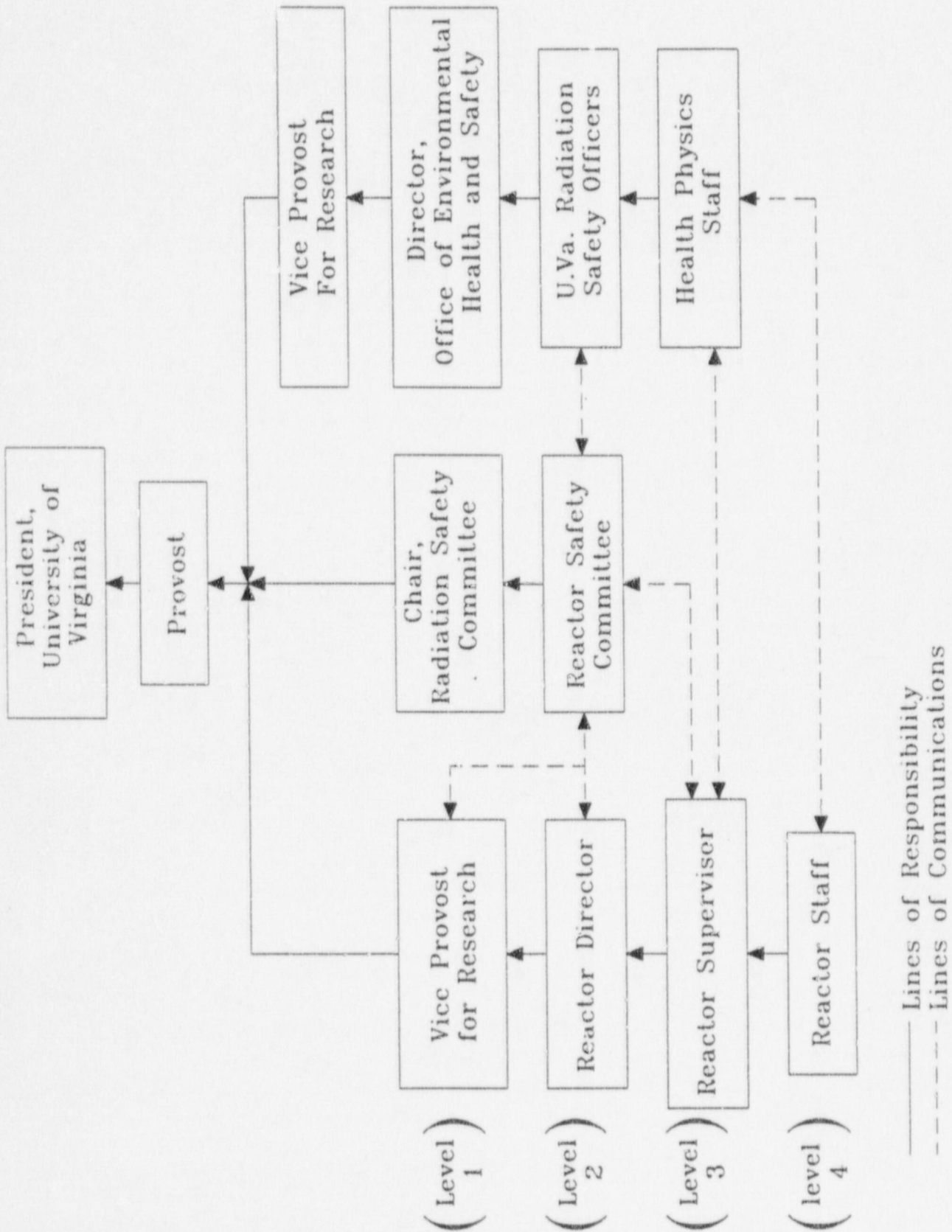


Figure 6.1 Organizational Structure of the U.Va. Research Reactor Facility

The revised pages in attachment replace pages 42, 44, 56  
and 57 of the UVAR Tech. Specifications

6.0. ADMINISTRATIVE CONTROLS

6.1. Organization

Applicability: The specifications listed below in TS 6.1.1 through TS 6.1.4. apply to the organizational structure of the University of Virginia as it relates to the operation of the Reactor Facility.

Objective: The objective is to describe the chain of command having responsibility for the safe operation of the Reactor Facility. At the various administration levels, the functions, assignments, responsibilities and associated professional background, training and requalification requirements are listed, as applicable.

Specifications:

6.1.1. Structure

The Reactor Facility shall be an integral part of the University of Virginia. The organizational structure of U.V.A. relating to the Reactor Facility is shown in Figure 6.1. The Vice Provost for Research will have overall responsibility for management of the Facility (Level 1).

6.1.2. Responsibility

The Reactor Facility Director shall be responsible for the overall facility operation (Level 2). During periods when the Reactor Facility Director is absent, his responsibilities are delegated to the Reactor Supervisor (Level 3).

The Reactor Facility Director shall have at least a bachelor's degree in science or engineering and have a minimum of 5 years of experience in the nuclear field. A graduate degree may fulfill 4 years of experience on a one-for-one time basis.

The Reactor Supervisor(s) shall be responsible for the day-to-day operation of the UVAR and for ensuring that all operations are conducted in a safe manner and within the limits prescribed by the facility license and the provisions of the Reactor Safety Committee. During periods when the Reactor Supervisor(s) is (are) absent, his responsibilities are delegated to a person holding a Senior Reactor Operator license (Level 4).

A Reactor Supervisor shall have the equivalent of a bachelor's degree in science or engineering and have at least 2 years of experience in Reactor Operations at this facility, or an equivalent facility, or at least 6 years of experience in Reactor Operations. Equivalent education or experience may be substituted for a degree. Within nine months after being assigned to the position, the Reactor Supervisor shall obtain and maintain an NRC Senior Operator license.

6.2. Reactor Safety Committee

Applicability: The specifications 6.2.1 through 6.2.3 apply to the expert group who will provide specific reviews and audits of Reactor Facility operations.

Objective: To describe the makeup, responsibilities, and authority of the Reactor Safety Committee.

Specifications:

6.2.1. Composition and Qualification

There shall be a Reactor Safety Committee (R<sub>c</sub>SC) to review and audit reactor operations and ensure that the Reactor Facility is operated in a safe manner within the terms of the reactor license. Collectively, the committee members shall represent a broad spectrum of expertise in the research-reactor field. The members may be drawn from within or outside the operating organization. The R<sub>c</sub>SC reviews and audits are designed to uncover deficiencies that affect reactor safety.

The Reactor Safety Committee is part of the Radiation Safety Committee and shall report to the Chair of the Radiation Safety Committee, who is the coordinator for all licenses involving the use of radioactive materials and radiation producing equipment. The R<sub>c</sub>SC shall advise the The Vice Provost for Research and the Director of the Reactor Facility on safety concerns in the operation of the facility.

The Committee shall be composed of at least five members, and shall include the Radiation Safety Officer of the University and the Director of the Reactor Facility. The Reactor Director shall be the sole reactor staff representative on the Committee. The membership of the Committee shall be such as to maintain a degree of technical proficiency in areas relating to reactor operation and reactor safety.

6.2.2. Charter and Rules

- (1) A quorum of the Committee shall consist of not less than the majority of the full committee. The Chair can designate another member from the Committee to preside in his absence.
- (2) The Committee shall meet at least semiannually and shall be on call by the Chair. Minutes of all meetings shall be disseminated as designated by the Chair.
- (3) The Committee shall have a written charter defining such matters as the authority of the Committee, the subjects within its purview, and other administrative provisions as are required for effective functioning of the Committee.

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6.7. Reporting Requirements

Applicability: The specifications 6.7.1 and 6.7.2 listed below apply to routine and special reports made by the University of Virginia Reactor Facility to the U.S. Nuclear Regulatory Commission.

Objective: The objective is to provide the licensing agency (NRC) with relevant information concerning normal and abnormal reactor operations which are necessary for the fulfillment of its mission to protect the public health and safety. A secondary objective is to comply with reporting requirements as given in the federal regulations.

Specifications: In addition to federal regulatory requirements (for example, follow 10 CFR 20, 30.50, 40.60, and 70.50, as applicable), reports should be made to the U.S. Nuclear Regulatory Commission as follows:

6.7.1. Reporting of Incidents

- (1) Immediate notification should be made by telephone, to the U.S. Nuclear Regulatory Commission Headquarters Operations Center of:
  - (a) Personnel total effective dose equivalent of 25 rem or more.
  - (b) The release of radioactive material, inside or outside of a restricted area, that results, or could result, over a 24 hour period, in personnel intake of 5 times the annual limit on intake specified in 10 CFR 20.
- (2) A special report should be made by telephone as soon as possible, but no later than the next working day, to the U.S. Nuclear Regulatory Commission Headquarters Operations Center of:
  - (a) Personnel exposures or releases of radioactive material greater than the limits in 10 CFR 20.
  - (b) Reportable occurrences as defined in Section 6.6.2 of these specifications.
  - (c) Violation of a safety limit.
- (3) A special written report should be sent by mail within 14 days to the U.S. Nuclear Regulatory Commission, Document Control Desk, Washington, D.C. 20555
  - (a) Accidental off-site release of radioactivity above 10 CFR 20 limits, whether or not the release resulted in property damage, personal injury, or exposure.
  - (b) Reportable occurrence as defined in Section 6.6.2 of these specifications.
  - (c) Violation of a safety limit.
- (4) A special written report should be sent by mail within 30 days to the U.S. Nuclear

Regulatory Commission, Document Control Desk, Washington, D.C. 20555, of:

- (a) Substantial variance from performance specifications contained in these specifications or in the UVAR SAR.
  - (b) Significant change in the transient or accident analyses as described in the UVAR SAR.
  - (c) Changes in personnel serving as Vice Provost for Research, Reactor Facility Director, or Reactor Supervisor.
- (5) A written report should be sent within nine months after initial criticality of the reactor or within 90 days of completion of the startup test programs, whichever is earlier, to the U.S. Nuclear Regulatory Commission, Document Control Desk, Washington, D.C. 20555, upon receipt of a new facility license, an amendment to the license authorizing an increase in power level or the installation of a new core with fuel elements of a design different design than previously used. The report will include the measured values of the operating conditions or characteristics of the reactor under the new conditions, including:
- (a) Total control rod reactivity worth.
  - (b) Reactivity worth of the single control rod of highest reactivity worth.
  - (c) Minimum shutdown margin both at ambient and operating temperatures.

#### 6.7.2. Routine Reports

A routine report will be made by March 31 of each year to the U.S. Nuclear Regulatory Commission, Document Control Desk, Washington, D.C. 20555, providing the following information:

- (1) A narrative summary of operating experience (including experiments performed), and of changes in reactor design, performance characteristics, and operating procedures related to the reactor safety occurring during the reporting period.
- (2) A tabulation showing the energy generated by the reactor (in megawatt hours) and the number of hours the reactor was critical during the year.
- (3) A report of the results of the safety-related maintenance and inspections. The reasons for corrective maintenance of safety-related items will be included.

Fig. 6.1      Organizational Structure of the U.Va.  
Research Reactor Facility

This revised Figure 6.1 replaces page 32  
of the CAVALIER Technical Specifications,

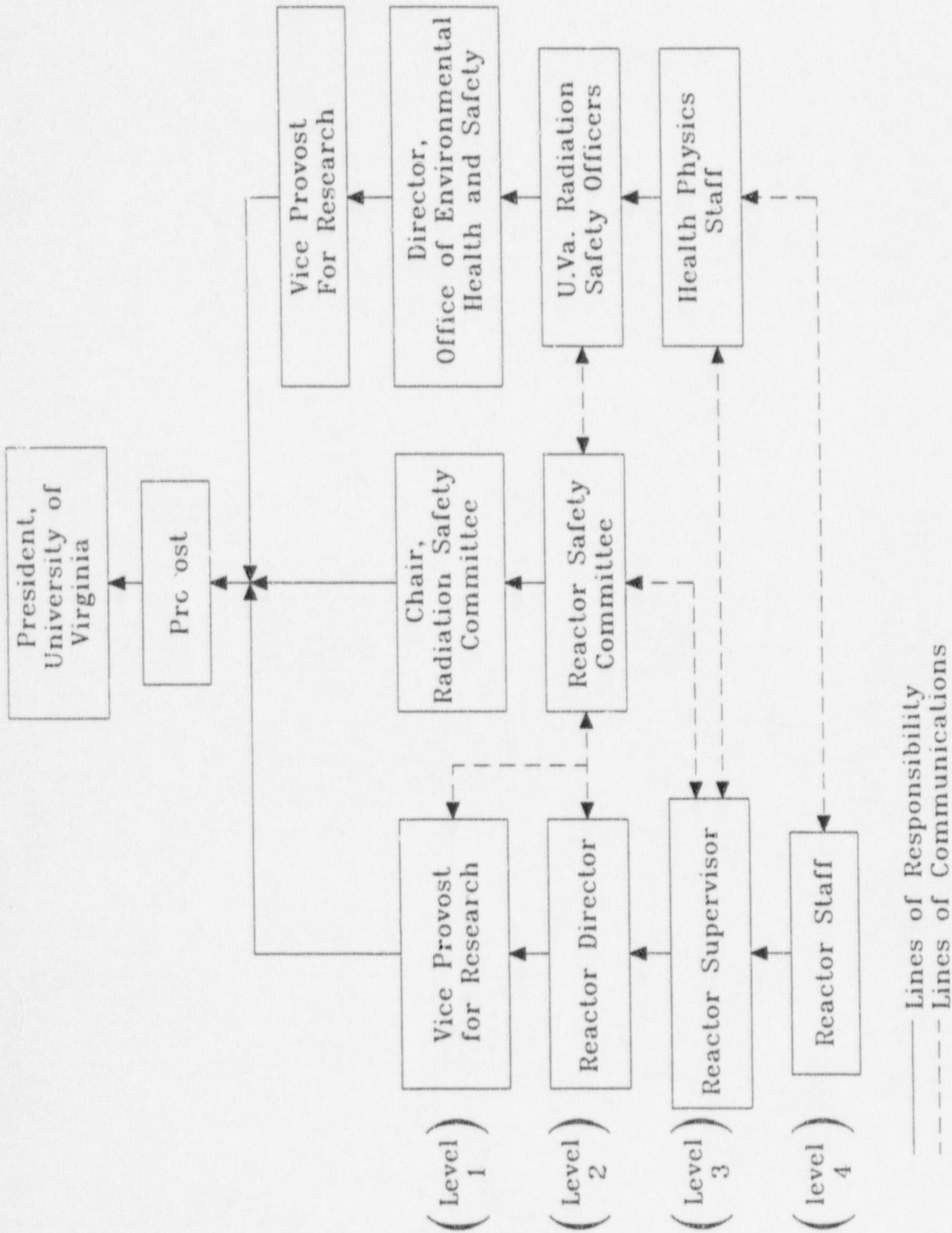


Figure 6.1 Organizational Structure of the U.Va. Research Reactor Facility

The revised pages in attachment replace pages  
21 through 23 of the CAVALIER Tech. Specifications

### Objective

The objective is to assure that fuel which is being stored will not become supercritical and will not reach unsafe temperatures.

### Specification

(1) All reactor fuel elements not in the reactor core shall be stored in a geometric array where  $k_{eff}$  is less than 0.9 for all conditions of moderation.

(2) Irradiated fuel elements and fueled devices shall be stored in an array which will permit sufficient natural convection cooling by water or air such that the fuel element or fueled device surface temperature will not exceed the boiling point of water.

### Bases

Within these specifications, the fuel can be stored safely under all conditions. The UVAR storage facility was constructed to meet these specifications and will be used to store the CAVALIER elements.

## 6.0 ADMINISTRATIVE CONTROLS

### 6.1 Organization

#### 6.1.1 Structure

The reactor facility shall be an integral part of the University of Virginia. The organizational structure of UVA relating to the reactor facility is shown in Figure 6.1. The Vice Provost for Research will have overall responsibility for management of the facility (Level 1).

### 6.1.2 Responsibility

The Reactor Facility Director shall be responsible for the overall facility operation (Level 2). During periods when the Reactor Facility Director is absent, his responsibilities are delegated to the Reactor Supervisor (Level 3).

The Reactor Facility Director shall have at least a Bachelor of Science or Engineering degree and have a minimum of 5 years of nuclear experience. A graduate degree may fulfill 4 years of experience on a one-for-one time basis.

The Reactor Supervisor shall be responsible for the day-to-day operation of the UVAR and CAVALIER and for ensuring that all operations are conducted in a safe manner and within the limits prescribed by the facility license and the provisions of the Reactor Safety Committee. During periods when the Reactor Supervisor is absent, his responsibilities are delegated to a person holding a Senior Reactor Operator license (Level 4).

The Reactor Supervisor shall have the equivalent of a Bachelor of Science or Engineering degree and have at least 2 years of experience in Reactor Operations at this facility, or an equivalent facility, or at least 6 years of experience in Reactor Operations. Equivalent education or experience may be substituted for a degree. Within nine months after being assigned to the position, the Reactor Supervisor shall obtain and maintain an NRC Senior Operator license.

### 6.1.3 Staffing

When the reactor is operating the following conditions will be met:

- (1) A licensed Senior Reactor Operator or a licensed Reactor Operator shall be present at the reactor controls, however, a trainee may be

present at the controls is under the direct supervision of Senior Reactor Operator or Reactor Operator in the control room. (2) A licensed Senior Reactor Operator shall be on call, but not necessarily at the facility.

(3) At least one other person, not necessarily licensed to operate the reactor, shall be present at the facility.

(4) Rearrangements of the core or other nonroutine actions shall be supervised by a licensed Senior Reactor Operator.

(5) A health physicist who is organizationally independent of the Reactor Facility Operations groups, as shown in Figure 6.1, shall be responsible for radiological safety at the facility.

#### 6.2 Review and Audit

There shall be a Reactor Safety Committee that shall review and audit reactor operations to ensure that the facility is operated in a manner consistent with public safety and within the terms of the facility license. The Reactor Safety Committee shall report to the Chair of the Radiation Safety Committee and advise the Vice Provost for Research, and the Reactor Facility Director on those areas of responsibility specified below.

##### 6.2.1 Composition and Qualification

The Committee shall be composed of at least five members, one of whom shall be the Radiation Safety Officer of the University. No more than two members will be from the organization responsible for Reactor Operations. The membership of the Committee shall be such as to maintain a degree of technical proficiency in areas relating to reactor operation and reactor safety.

The revised pages in attachment replace pages  
28, 29, and 30 of the CAVALIER Tech. Specifications.

(The changes are related to the new NRC reporting address,  
and on page 30, also for the requested U.Va. TS 6.1 amendment.)

#### 6.5.1 Records To Be Retained for a Period of at Least Five Years

- (1) normal plant operation
- (2) principal maintenance activities
- (3) experiments performed with the reactor
- (4) reportable occurrences
- (5) equipment and component surveillance activity
- (6) facility radiation and contamination surveys
- (7) transfer of radioactive material
- (8) changes to operating procedures

#### 6.5.2 Records To Be Retained for the Life of the Facility

- (1) gaseous and liquid radioactive effluents released to the environs
- (2) offsite environmental monitoring surveys
- (3) fuel inventories and transfers
- (4) radiation exposures for all personnel
- (5) changes to reactor systems, components, or equipment that may affect reactor safety
- (6) updated and corrected drawings of the facility
- (7) minutes of Reactor Safety Committee meetings

#### 6.6 Reporting Requirements

In addition to the requirements of applicable regulations (such as 10 CFR 20, 30.50, 40.60, and 70.50, as applicable), reports should be made to the U.S. Nuclear Regulatory Commission as follows:

##### 6.6.1 Special Reports

- (1) A report should be made by telephone as soon as possible, but no later than the next working day, to the U.S. NRC Operations Center.

(c) changes in personnel serving as Vice Provost for Research, Reactor Facility Director, or Reactor Supervisor

(4) A report within nine months after initial criticality of the reactor or within 90 days of completion of the startup test programs, whichever is earlier, to US NRC, ATTN: Document Control Desk, Washington, D.C. 20555 upon receipt of a new facility license, an amendment to the license authorizing an increase in power level or the installation of a new core of a different design than previously used. The report will include the measured values of the operating conditions or characteristics of the reactor under the new conditions, including

- (a) total control rod reactivity worth
- (b) reactivity worth of the single control rod of highest reactivity worth
- (c) minimum shutdown margin both at ambient and operating temperatures.

#### 6.6.2 Routine Reports

A routine report will be made by march 31 of each year to the US NRC, ATTN: Document Control Desk, Washington, D.C. 20555 providing the following information:

- (1) A narrative summary of operating experience (including experiments performed) and of changes in facility design, performance characteristics, and operating procedures related to the reactor safety occurring during the reporting period.

The revised page in attachment replaces page 2-18  
of the CAVALIER Decommissioning Plan

### 2.3 Decommissioning Organization and Responsibilities

The Reactor Facility is an integral part of the University of Virginia. The present organizational structure of the Reactor Facility is shown in Figure 5. The Vice Provost for Research has overall responsibility for management of the Reactor Facility (Level 1).

The Reactor Facility Director is responsible for the overall facility operation (Level 2). He has a doctorate degree in nuclear engineering and is an associate professor in the department of Mechanical, Aerospace and Nuclear Engineering. The Director is responsible for overall planning and for providing direction to the reactor supervisor. He developed the plan and will have overall supervision over the decommissioning operations.

Below the Reactor Director (at Level 3) is the Reactor Supervisor (responsible for reactor operation, maintaining facility records & budgets, quality assurance, training, facility security, etc.). His degree is in nuclear engineering. During the active phase of the decommissioning the supervisor has day-to-day oversight and will manage the dismantling group. The reactor supervisor shall be responsible for safely dismantling of the CAVALIER, assuring that operations are conducted within the limits prescribed by the facility license, federal regulations, the Facility's QA/QC Plan and the requirements of the decommissioning plan. He shall be advised by the reactor director on compliance matters and by the reactor health physicist on radiological requirements.

In the event that problems are encountered with the execution of the decommissioning plan, the reactor supervisor will communicate these to the reactor director. Significant occurrences shall be reported to the Reactor Safety Committee, stating the causes and corrective actions taken or proposed. Reports to the NRC of abnormal occurrences shall be made as defined and prescribed in the CAVALIER SOP's, which will continue to apply until the successful termination of the decommissioning activities.

Figure 5. Organizational Structure of the  
U.Va. Reactor Facility

This revision replaces page 2-19 of the

"Decommissioning Plan for the University of Virginia  
100W CAVALIER Reactor and the Application for the  
Termination of the CAVALIER Operating License"

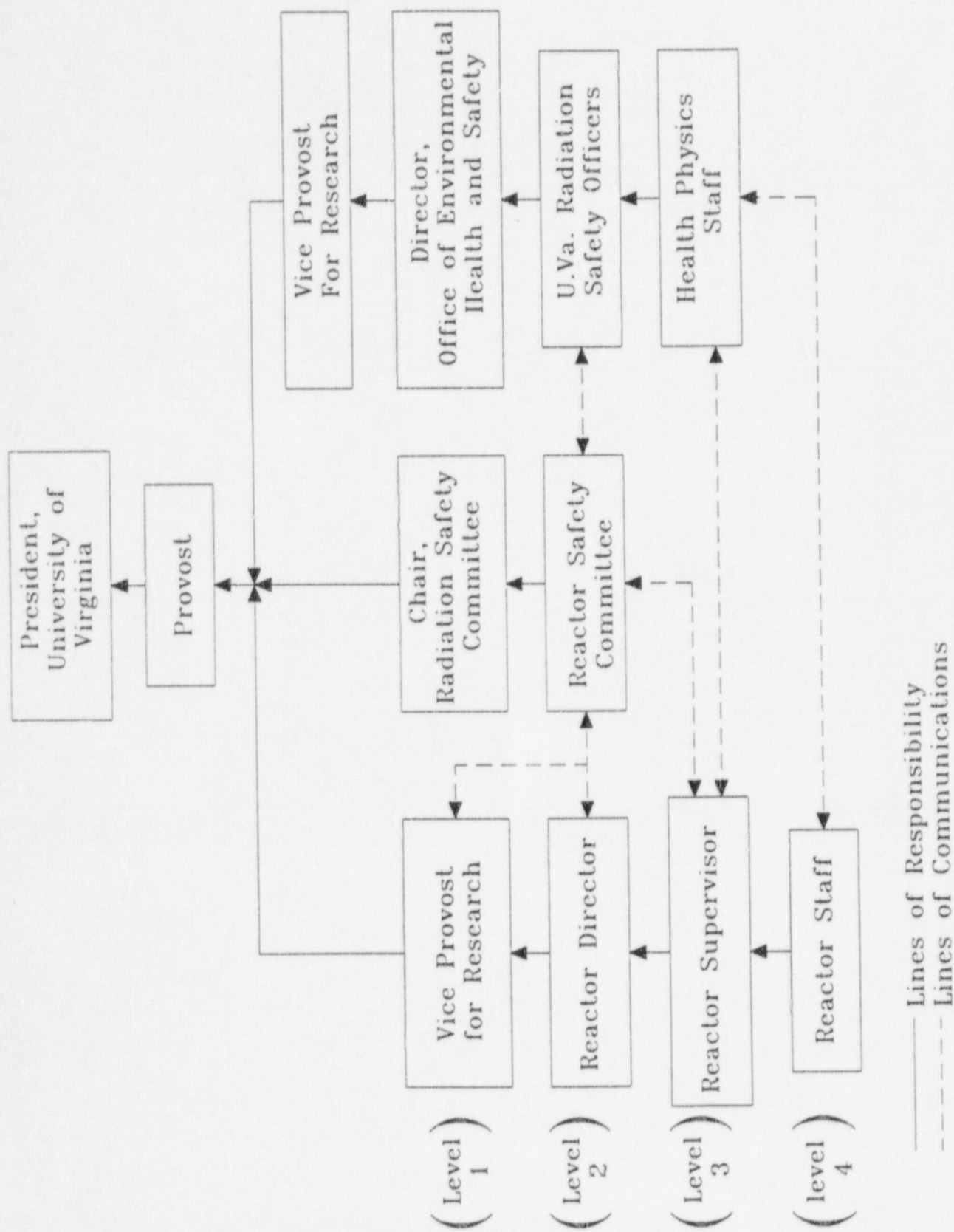


Figure 5 Organizational Structure of the U.Va. Research Reactor Facility

Fig. 3 Organizational Structure of the U.Va.  
Research Reactor Facility

This revised Figure 3 is a replacement for the  
last page of the NRC Order Authorizing Dismantling and  
Disposition of Component Parts -  
University of Virginia Cavalier Research Reactor

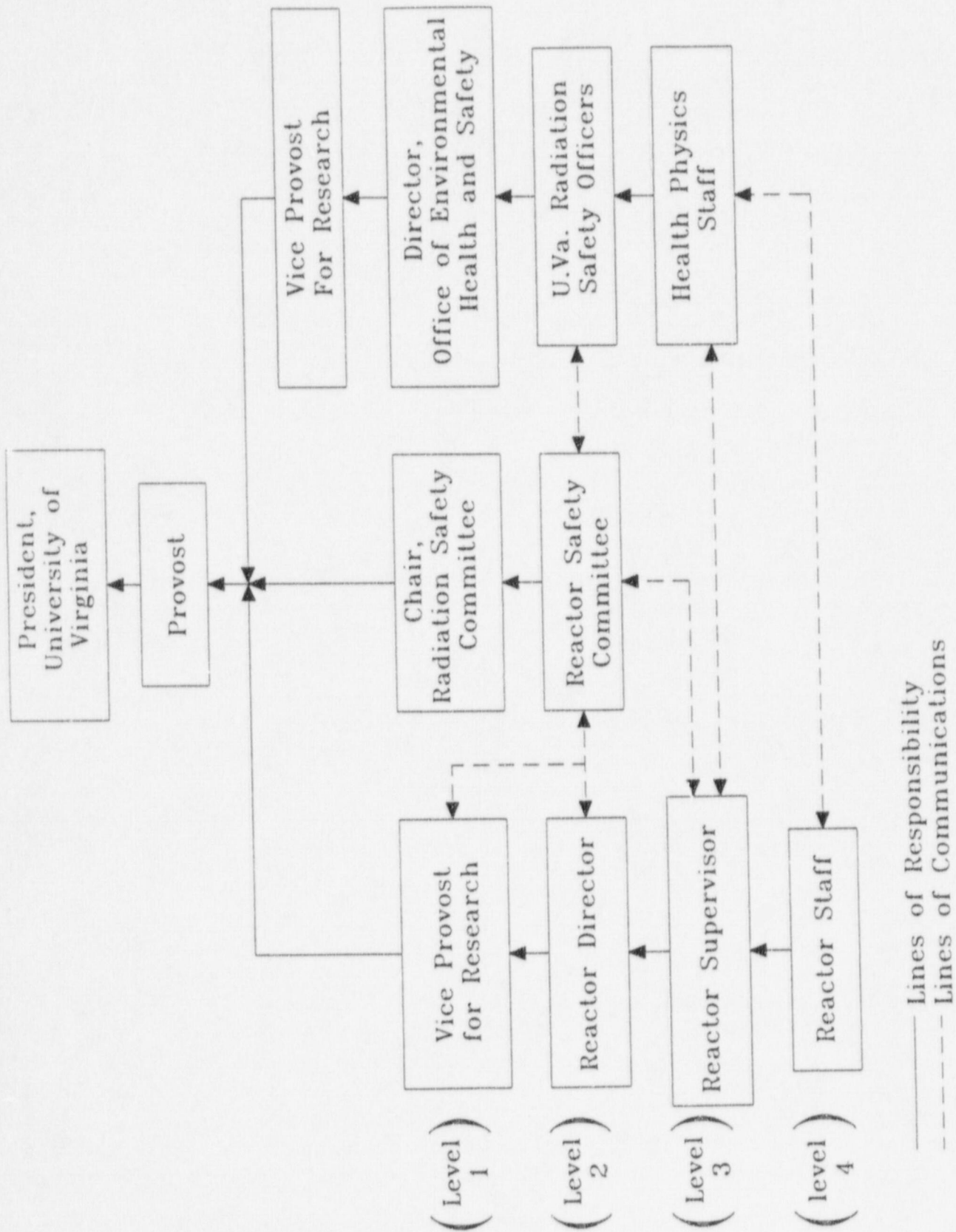


Figure 3 Organizational Structure of the U.Va. Research Reactor Facility