APPENDIX A

FACILITY LICENSE NO. R-66

TECHNICAL SPECIFICATIONS

FOR THE

UNIVERSITY OF VIRGINIA

DOCKET NO. 50-62

DATE: JULY, 1980

TABLE OF CONTENTS

3.3 Reactor Instrumentation

Applicability

This application applies to the instrumentation which must be operable for safe operation of the reactor.

Objective

The objective is to require that sufficient information is available to the operator to assure safe operation of the reactor.

Specification

The reactor shall not be operated unless the measuring channels described in Section 3.2 "Reactor Safety Systems" and in the following table are operable.

Measuring Channel	Minimum No. Operable	Operating Mode in Which Required
Linear Power	1	All Modes
Log N and Period	1	All Modes
Core Gamma Monitor*	1	All Modes
Reactor Room Constant* Air Monitor	1	All Modes*
Bridge Radiation Monitor	1	All Modes
Reactor Face Monitor*	1	All Modes*
Pool Water Level Monitor	2	Forced Convection Mode
Pool Water Temperature	1	All Modes
Primary Coolant Flow	1	Forced Convection Mode
Start-Up Count Rate	1	Reactor Start-Up
Reactor Power Level	2	All Modes

*The reactor room constant air monitor, reactor face monitor, and core gamma monitor may be out of service for a period not to exceed 7 days without requiring reactor shutdown. If the reactor face monitor cannot be repaired within 7 days, it may be replaced by a locally alarming monitor of similar range for up to 30 days without requiring a reactor shutdown.

3.10 Emergency Removal of Decay Heat

Applicability

This specification applies to the emergency removal of decay heat.

Objective

The objective is to assure that the flow rate from this system is sufficient to prevent overheating of the fuel elements subsequent to a total loss of primary water from the core.

Specification

There shall be two separate emergency core spray systems, each capable of maintaining a flow rate of at least 10 gpm over the 64 fuel element positions for the first 30 minutes, and at least 7-1/2 gpm over the 64 fuel element positions for the next 60 minutes following a total loss of coolant. These system shall be operable when the reactor is operated in the forced convection flow mode.

Bases

Either of the tow spray system as specified will provide sufficient cooling to maintain the fuel tmeperature below its melting point as demonstrated by the evaluation in Section 9.9 of the SAR.

4.0 SURVEILLANCE REQUIREMENTS

4.1 Shim Rods

Applicability

This specification applies to the surveillance requirements for the shim rods.

Objective

To assure that the shim rods are capable of performing their function and that no significant physical degradation in the rods has occurred.

Specification

a. Shim rod drop times shall be measured at intervals not to exceed five months. Shim rod drop times shall also be measured if the control assembly is moved to a new position in the core or if maintenance is performed on the mechanism.

b. The shim rod reactivity worths shall be measured whenever the rods are installed in a new core configuration.

c. The shim rods shall be visually inspected at intervals not to exceed thirteen months, and when rod drop times exceed the limiting conditions for operation, Section 3.9 of these specifications. If the shim rod is found to be deteriorated or to have a crack of more than 1/4 inches in length, it shall be removed from service.

Bases

The reactivity worth of the shim rods is measured to assure that the required shutdown margin is available and to provide means for determining the reactivity worth of experiments inserted in the core. The visual inspection of the shim rods and measurement of their drop times are made to determine whether the shim rods are capable of performing properly.

4.2 Reactor Safety System

Applicability

This specification applies to the surveillance requirements for the reactor safety system of the reactor.

Objective

The objective is to assure that the reactor safety system is operable as required by Specification 3.2.

Specification

a. A channel test of each of the reactor safety system measuring channels shall be performed prior to each day's operation or prior to each operation extending more than one day.

b. A channel check of each of the reactor safety system measuring channels shall be performed daily when the reactor is in operation.

c. A channel calibration of the reactor safety measuring channels shall be performed at intervals not to exceed eight months.

d. The power range channels 1 and 2 shall be checked against a primary system heat balance at least once each week the reactor is in operation above 100 kilowatts in the forced convection mode.

e. The following items which are listed in section 3.2 are not considered to be reactor safety measuring channels: Power to primary coolant pump, manual button, header air pressure, and pool water level monitor. Operation of these systems will be checked prior to each days operation or prior to each operation extending more than one day.

Bases

The daily channel tests and channel checks will assure that the safety channels are operable. The semi-annual calibration will permit any long-term drift of the channels to be corrected. The weekly calibration of the power measuring channels will correct for drift and assure operation within the requirements of the license.

4.8 Reactor Fuel Dose Measurements

Applicability

This specification applies to reactor fuel possessed under the Reactor Facility Licenses.

Objective

The objective of this specification is to ensure that the maximum quanity of special nuclear material does not exceed the limits specified in the Facility licenses.

Specification

A. The amount of special nuclear material (SNM) possessed at the Reactor Facility will be determined as necessary to ensure that limits specified by the Facility licenses are not exceeded. As a minimum a evaluation,will be completed and documented ever six months.

B. Fuel elements will be irradiated as a part of the core or shipped away from the Reactor Facility as necessary to ensure that the quanity of nonexempt SNM (as defined in 10 CFR Part 73) does not exceed that allowed by the Facility licenses. If the amound of nonexempt SNM exceeds 5.0 kg the Reactor Safety Committee will be informed.

C. Whenever fuel elements which have not been irradiated as a part of the core for at least one month, adequate dose rate measurements of representative fuel elements will be made as necessary to determine which fuel elements have dose rates higher than specified by 10 CFR Part 73.67 (b).

Basis

The specification will provide a high degree of assurance that the amount of SNM and nonexempt SNM does not exceed the license limits. The amount of nonexempt SNM will normally be maintained at less that 5.0 kg. In the event that this quanity is exceeded the Reactor Safety Committee will be informed and actions necessary to reduce the amount or other appropriate actions as defined in the Physical Security Plan will be defined.

6.2 Review and Audit

a. There shall be a Reactor Safety Committee which shall review and audit reactor operations to assure 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 President of the University and advise the Chairman, Department of Nuclear Engineering and the Reactor Facility Director on those areas of responsibility specified below.

b. 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.

c. A quorum of the Committee shall consist of not less than a majority of the full committee and shall include the Chairman or his designee.

d. The Committee shall meet at least once every six months and on call by the Chariman. Munutes of all meetings shall be disseminated to responsible personnel as designated by the Committee Chairman.

e. The Committee shall have a written statement defining such matters as the authority of the Committee, the subjects within its purview, and other such administrative provisions as are required for effective functioning of the Committee.

As a minimum the responsibilities of the Reactor Safety Committee include the following:

(1) Review and approval of untried experiments and tests which are significantly different from those previously used or tested in the reactor as determined by the Facility Director.

(2) Review and approval of changes to the reactor core, reactor systems or design features which may affect the safety of the reactor.

6.3 Operating Procedures

a. Written procedures reviewed and approved by the Reactor Safety Committee, shall be in effect and followed for the items listed below. These procedures shall be adequate to assure the safe operation of the reactor, but should not preclude the use of independent judgement and action should the situation require such.

(1) Startup, operation, and shutdown of the reactor.

(2) Installation or removal of fuel elements, control rods, experiments, and experimental facilities.

(3) Actions to be taken to correct specific and foreseen potential malfunctions of systems or components, including responses to alarms, suspected primary coolant system leaks, abnormal reactivity changes.

(4) Emergency conditions involving potential or actual release of radioactivity, including provisions for evacuation, re-entry, recovery, and medical support.

(5) Preventive and corrective maintenance operations which could have an effect on reactor safety.

(6) Periodic surveillance (including test and calibration) of reactor instrumentation and safety systems.

b. Radiation control procedures shall be maintained and made available to all operations personnel.

c. Substantive changes to the approved procedures shall be made only with the approval of the Reactor Safety Committee. Changes to the procedures which do not change their original intent may be made with the approval of the Facility Director. All such minor changes to procedures shall be documented and subsequently reviewed by the Reactor Safety Committee.