North Carolina State University is a land-grant university and a constituent institution of The University of North Carolina

Nuclear Reactor Program

NC STATE UNIVERSITY

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919.515.5115 (fax)
URL:www.ne.ncsu.edu/NRP/reactor_program.html

9 January 2001

SUBJECT: Technical Specification Amendment Request dated August 23, 2000
License R-120
Docket No. 50-297

Dear Mr. Adams:

Your request for additional information and clarifications as stated in your letter dated November 13, 2000 regarding the review of Amendment 14 to our Technical Specifications are addressed by this response.

All affected pages for Amendment 14 are attached. Please note that the dates have been removed from the page footer leaving only the amendment number (Amendment 14) on those affected pages. Also, attached are the strike-out copies for pages 49 and 52 indicating the changes made from the previous Amendment 14 request that was executed on August 23, 2000.

Each of your three questions in your request for additional information are addressed by this response as follows:

1. A justification and safety review addressing each change is given in Attachment 1.

2. Answers to your questions regarding TS 6.2.2 (a) are given in Attachment 1 Items 3, 4, and 5. As a result of the response to these questions, TS 6.2.2 (a) has been reworded for clarification. Refer to the attached page 49.

3. Answers to your questions regarding TS 6.3 are given in Attachment 1 Items 8 and 9. As a result of the response to these questions, TS 6.3.2 (a) has been reworded for clarification. Refer to the attached page 52.

If you have any questions regarding the above information, please contact me at (919) 515-4601.

I declare under penalty of perjury that the foregoing is true and correct. Executed on 9 January 2001.

Gerald D. Wicks

Gerald D. Wicks, CHP
Reactor Health Physicist & Lecturer
Acting Associate Director

A020

UPDATED SAFETY ANALYSIS REPORT

APPENDIX A

TECHNICAL SPECIFICATIONS FOR THE

NORTH CAROLINA STATE UNIVERSITY

PULSTAR REACTOR

FACILITY LICENSE NO. R-120
DOCKET NO. 50-297

ORIGINAL ISSUE DATE: August 25, 1972

AMENDMENT 14

TABLE OF CONTENTS

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ii. Attempts will be made to identify and limit the quantities of elements having very large thermal neutron absorption cross sections, in order to quantify reactivity effects.

iii. Explosive material[1], shall not be allowed in the reactor. Experiments reviewed by the Radiation Safety Committee in which the material is considered to be potentially explosive, either while contained, or if it leaks from the container, shall be designed to maintain seal integrity even if detonated, to prevent damage to the reactor core or to the control rods or instrumentation and to prevent any change in reactivity.

iv. Each experiment will be evaluated with respect to radiation-induced physical and/or chemical changes in the irradiated material, such as decomposition effects in polymers.

v. Experiments involving flammable[1] or highly toxic materials[1] require specific procedures for handling and shall be limited in quantity as approved by the Radiation Safety Committee. No cryogenic liquids[1] will be allowed within the biological shield of the PULSTAR Reactor.

f. Credible failure of any experiment shall not result in releases or exposures in excess of the annual limits established in 10 CFR 20.

[1]Defined as follows (reference - "Handbook of Laboratory Safety" - Chemical Rubber Company, 4th Ed., 1995, unless otherwise noted):

Toxic: A substance that has the ability to cause damage to living tissue when inhaled, ingested, injected, or absorbed through the skin ("Safety in Academic Chemistry Laboratories" - The American Chemical Society, 1994).

Flammable: Having a flash point below 73°F and a boiling point below 100°F. The flash point is defined as the minimum temperature at which a liquid forms a vapor above its surface in sufficient concentration that it may be ignited as determined by appropriate test procedures and apparatus as specified.

Explosive: Any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion with substantially simultaneous release of gas and heat, the resultant pressure being capable of destructive effects. The term includes, but is not limited to, dynamite, black powder, pellet powder, initiating explosives, detonators,

safety fuses, squibs, detonating cord, igniter cord, and igniters.

Cryogenic: A cryogenic liquid is considered to be a liquid with a normal boiling point below -238°F (reference - National Bureau of Standards Handbook 44).

Bases

Specifications 3.7a, 3.7b, 3.7c, and 3.7d are intended to reduce the likelihood of damage to reactor components and/or radioactivity releases resulting from experiment failure; and, serve as a guide for the review and approval of new and untried experiments by the facility personnel, as well as the Radiation Safety Committee.

Specification 3.7e insures that no physical or nuclear interferences compromise the safe operation of the reactor, specifically, an experiment having a large reactivity effect of either sign could produce an undesirable flux distribution that could affect the peaking factor used in the Safety Limit calculation and/or safety channels calibrations. Review of the experiments using these LCOs and the Administrative Controls of Section 6 will insure the insertion of experiments will not negate the considerations implicit in the Safety Limits and thereby become an Unreviewed Safety Question.

analysis or technical support, and at least two years of supervisory experience. A B.S. degree in Nuclear Engineering or Physics may substitute for one year of the reactor analysis and or technical support experience.

LEVEL 3 - Reactor Operations Manager: The Reactor Operations Manager, who shall be qualified as a Senior Reactor Operator, shall be responsible for assuring that operations are conducted in a safe manner and within the limits prescribed by the facility license, all applicable Nuclear Regulatory Commission regulations, and the provisions of the Radiation Safety Committee. The Reactor Operations Manager reports directly to the Associate Director of the Nuclear Reactor Program.

LEVEL 4 - Operating Staff: This level includes the positions of Chief Reactor Operator, Chief of Reactor Maintenance, and the remaining Senior and Reactor operators. Personnel at this level report to the Reactor Operations Manager (for PULSTAR Reactor related matters).

Reactor Health Physicist: The Reactor Health Physicist is responsible for assuring the safety of reactor operations from the standpoint of radiation protection. The Reactor Health Physicist reports directly to the Nuclear Engineering Department Head and shall function independent of the campus Radiation Safety Division as shown in Figure 6.1-1. He shall possess relevant practical experience in the application of health physics principles.

In all instances, responsibilities of one level may be assumed by designated alternates or by higher levels, conditional upon the appropriate qualifications.

6.1.2 Minimum Staffing

The minimum staffing when the reactor is not secured shall be:

a. A certified reactor operator (either Senior Operator or Operator) in the Control Room.

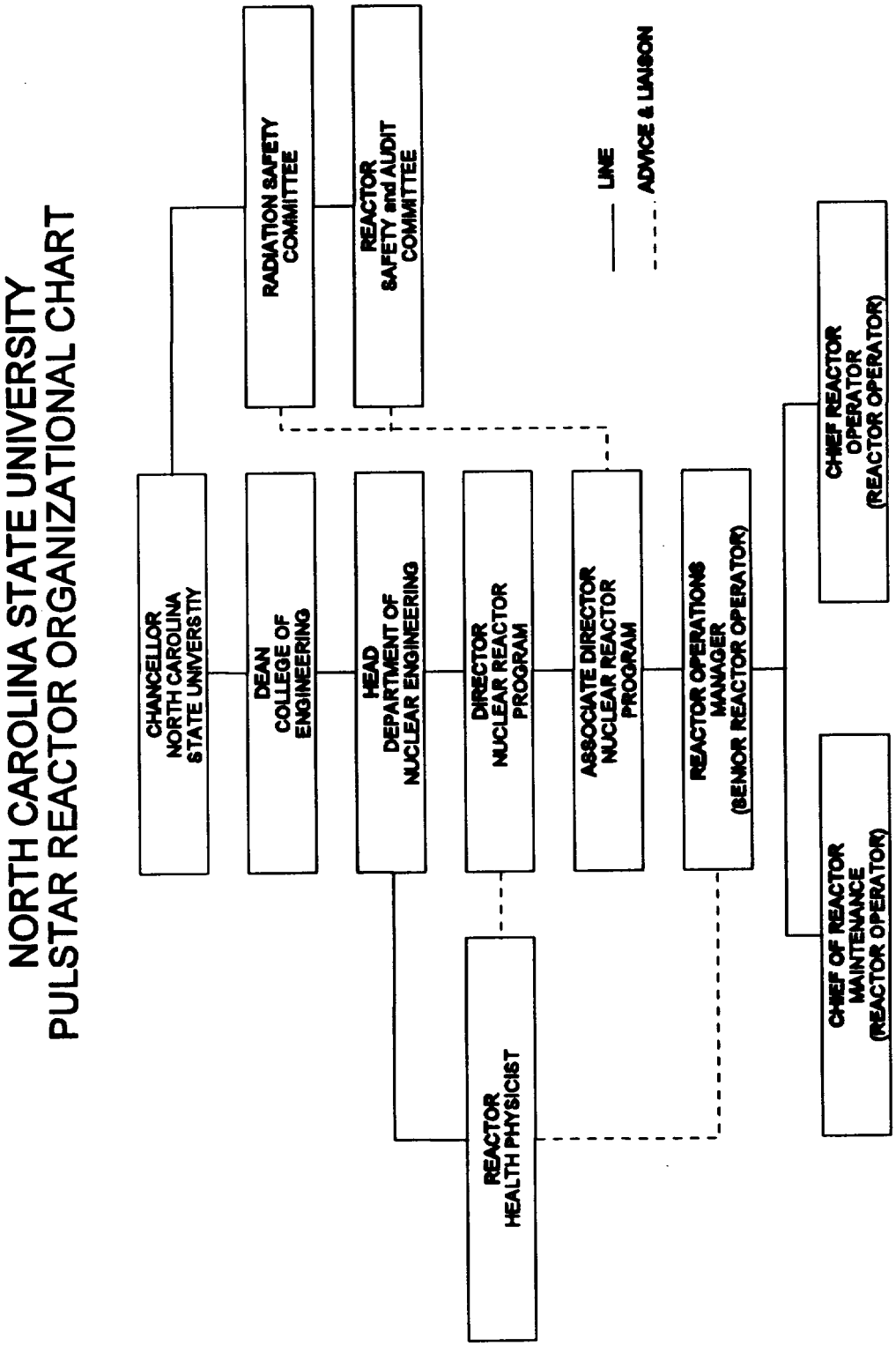
b. A Reactor Operator Assistant (ROA), capable of being at the reactor facility within five minutes upon request of the reactor operator on duty.

c. A Senior Reactor Operator. This individual may be referred to as the "Designated Senior Reactor Operator (DSRO)" and shall be readily on call, meaning:

   i. Has been specifically designated and the designation known to the reactor operator on duty.

   ii. Keeps the reactor operator on duty informed of where he may be rapidly contacted and the phone number.

Figure 6.1-1


NORTH CAROLINA STATE UNIVERSITY
PULSTAR REACTOR ORGANIZATIONAL CHART
RADIATION SAFETY COMMITTEE
REACTOR SAFETY and AUDIT COMMITTEE
LINE
ADVICE & LIAISON
CHANCELLOR NORTH CAROLINA STATE UNIVERSITY
DEAN COLLEGE OF ENGINEERING
HEAD DEPARTMENT OF NUCLEAR ENGINEERING
DIRECTOR NUCLEAR REACTOR PROGRAM
ASSOCIATE DIRECTOR NUCLEAR REACTOR PROGRAM
REACTOR OPERATIONS MANAGER (SENIOR REACTOR OPERATOR)
CHIEF REACTOR OPERATOR (REACTOR OPERATOR)
CHIEF OF REACTOR MAINTENANCE (REACTOR OPERATOR)
REACTOR HEALTH PHYSICIST

6.2 Review and Audit

6.2.1 Radiation Safety Committee and Reactor Safety and Audit Committee

The Radiation Safety Committee (RSC) has the primary responsibility to ensure that the use of radioactive materials and radiation producing devices, including the nuclear reactor, is conducted in the safest possible manner with the minimum effect on members of the University community and the general public. The RSC exercises oversight over the University Radiation Protection Program and performs final review of the actions of the Reactor Safety and Audit Committee (RSAC).

RSAC has the primary responsibility to assist the RSC in ensuring that the reactor is operated in compliance with the facility license and all applicable regulations. RSAC performs an annual audit of the operations and performance of the reactor program.

6.2.2 RSC and RSAC Composition and Qualifications

a. RSC shall consist of at least five members from the general faculty who are actively engaged in teaching/research involving radioactive materials for terms of at least three years, no more than two permanent members from the line organization given in Figure 6.1-1, and at least one permanent member from the Radiation Safety Division of the Environmental Health and Safety Center. Non-faculty members who are knowledgeable in nuclear science or radiation safety fields may also serve as members for terms of at least three years. Requirements for membership and appointments to the committee are made by the University through the office of the Vice Chancellor for Finance and Business and the Provost.

b. RSAC shall consist of at least five persons who have expertise in one or more of the component areas of nuclear reactor safety. These include Nuclear Engineering, Nuclear Physics, Health Physics, Electrical Engineering, Chemical Engineering, Material Engineering, Radiochemistry, and Nuclear Regulatory Affairs. At least three of the members are appointed from the general faculty. These faculty members shall be constituted as follows: Director of the Nuclear Reactor Program shall serve as a permanent member, one member from an appropriate discipline within the College of Engineering, and one member from the general faculty. Appointments are for three years. The remaining RSAC members are the Reactor Health Physicist and a member from the Radiation Safety Division of the Environmental Health and Safety Center who serve as permanent members. An additional member may represent an outside nuclear related agency. At the discretion of RSAC, specialist from other universities and outside establishments may be invited to assist in its appraisals.

c. A quorum shall consist of not less than a majority of the full RSC or RSAC and shall include the chairman or his designated alternate. Members from the line organization shown in Figure 6.1-1 shall not form a quorum.

d. RSC and RSAC shall meet at least four times per year, with intervals between meetings not to exceed six months. Both committees may also meet upon call of the Chair.

6.2.3 RSC/RSAC Review and Approval Function

The following items shall be reviewed and approved by the RSC or by referral to the RSAC, as needed:

a. Determinations that proposed changes in equipment, systems, test, experiments, or procedures which have safety significance do not involve an unreviewed safety question.

b. All new procedures and major revisions thereto having safety significance, proposed changes in reactor facility equipment, or systems having safety significance.

c. All new experiments or classes of experiments that could affect reactivity or result in the release of radioactivity.

d. Proposed changes to the Technical Specifications or facility license.

e. Violations of technical specifications or license. Violations of internal procedures or instructions having safety significance.

f. Operating abnormalities having safety significance.

g. Reportable Events (as per technical specification definition 1.22).

h. Audit reports.

RSC summaries and meeting minutes shall be provided to the Chancellor, Provost, Vice Chancellor for Research, Vice Chancellor for Business and Finance, Faculty Senate, and University Archives.

A summary of RSAC meeting minutes, reports, and audit recommendations approved by RSAC shall be submitted to Dean of the College of Engineering, Head of the Nuclear Engineering Department, Director of the Nuclear Reactor Program, Associate Director of the Nuclear Reactor Program, the RSC, Director of Environmental Health and Safety, and the RSAC prior to the next scheduled RSAC meeting. Recommendations of the annual audit made by RSAC are forwarded to the RSC for concurrence before being implemented.

6.2.4 RSAC Audit Function

The audit function shall consist of selective, but comprehensive, examination of operating records, logs, and other documents. Discussions with cognizant personnel and observation of operations shall also be used as appropriate. The RSAC, under the authority of the RSC, shall be responsible for this audit function. This audit shall include:

a. Facility operations for conformance to the technical specifications and license, annually, but at intervals not to exceed fifteen months.

b. The retraining and requalification program for the operating staff, biennially, but at intervals not to exceed thirty months.

c. The results of action taken to correct those deficiencies that may occur in the reactor facility equipment, systems, structures, or methods of operations that affect reactor safety, annually, but at intervals not to exceed fifteen months.

d. The Emergency Plan and Emergency Procedures, biennially, but at intervals not to exceed thirty months.

e. Radiation Protection.

Deficiencies uncovered that affect reactor safety shall be immediately reported to the Head of the Nuclear Engineering Department, Director of the Nuclear Reactor Program and the Associate Director of the Nuclear Reactor Program, and the RSC.

6.3 Operating Procedures

6.3.1 Written Procedures

Written procedures shall be prepared, reviewed and approved prior to initiating any of the following:

a. Startup, operation and shutdown of the reactor.

b. Fuel loading, unloading, and movement within the reactor.

c. Maintenance of major components of systems that could have an affect on reactor safety.

d. Surveillance checks, calibrations and inspections required by the technical specifications or those that may have an affect on reactor safety.

e. Personnel radiation protection, consistent with applicable regulations and that include commitment and/or programs to maintain exposures and releases as low as reasonably achievable (ALARA).

f. Administrative controls for operations and maintenance and for the conduct of irradiations and experiments that could affect reactor safety or core reactivity.

Substantive changes to the above procedures shall be made effective only after documented review by the RSC (or RSAC as applicable) and approval by the Associate Director of the Nuclear Reactor Program, or his designated alternate.

Minor modifications to the original procedures which do not change their original intent may be made by the Reactor Operations Manager, but the modifications shall be approved by the Associate Director of the Nuclear Reactor Program within 14 days.

Temporary deviations from procedures may be made by the Senior Reactor Operator (on duty as required by specification 6.1.2 c.) or Reactor Operations Manager, in order to deal with special or unusual circumstances or conditions. Such deviations shall be documented and reported to the Associate Director of the Nuclear Reactor Program, or his designated alternate.

6.3.2 Emergency Plan and Implementing Procedures

a. The Emergency Plan is approved by the Associate Director of the Nuclear Reactor Program, RSC (or RSAC as applicable), and forwarded to the Nuclear Regulatory Commission.

b. The implementing procedures for the Emergency Plan are updated and approved by the Associate Director of the Nuclear Reactor Program.

6.3.3 Physical Security Plan and Implementing Procedures

a. The Physical Security Plan is approved by the Associate Director of the Nuclear Reactor Program and forwarded to the Nuclear Regulatory Commission. This document, pursuant to 10 CFR 2.790, is to be withheld from public disclosure.

b. The implementing procedures for the Physical Security Plan are updated and approved by the Associate Director of the Nuclear Reactor Program.

6.4 Review of Experiments

6.4.1 New (untried) Experiments

All new experiments or class of experiments, referred to as "untried" experiments, shall be reviewed and approved by the Associate Director of the Nuclear Reactor Program, Reactor Health Physicist, and the Radiation Safety Committee (or RSAC as applicable), prior to initiation of the experiment.

The review of new experiments shall be based on the limitations prescribed by Technical Specifications 3.7 and 3.8 and other Nuclear Regulatory Commission regulations, as applicable. If the Radiation Safety Committee, the Associate Director of the Nuclear Reactor Program, and the Reactor Health Physicist jointly agree that the experiment can be safely performed within the limitations of the technical specifications and other applicable Nuclear Regulatory Commission regulations, then an approved PULSTAR Project Number can be issued by the RSC for the experiment.

6.4.2 Tried Experiments

All proposed experiments are reviewed by the Reactor Operations Manager and the Reactor Health Physicist (or their designated alternates). Either of these individuals may deem that the proposed experiment is not adequately covered by the documentation/analysis associated with an existing approved PULSTAR Project and therefore constitutes an untried experiment that will require the approval process detailed under Technical Specification 6.4.1. If the Reactor Operations Manager and the Reactor Health Physicist concur that the experiment is a tried experiment, then the request is approved and the experiment can be scheduled within the limitations of the reactor operating schedule.

Substantive changes to previously approved experiments shall be made only after review and approval by the Associate Director of the Nuclear Reactor Program, Reactor Health Physicist, and the Radiation Safety Committee (or RSAC as applicable).

6.5 Action to be Taken in Case of Safety Limit Violation

In the event a Safety Limit is violated:

a. The reactor shall be shut down and reactor operations shall not be resumed until authorized by the Nuclear Regulatory Commission.

b. The Safety Limit violation shall be promptly reported to the Associate Director of the Nuclear Reactor Program, or his designated alternate.

c. The Safety Limit violation shall be reported to the Nuclear Regulatory Commission in accordance with specification 6.7.1.

d. A Safety Limit violation report shall be prepared that describes the following:

   i. Circumstances leading to the violation including, when known, the cause and contributing factors.

   ii. Effect of violation upon reactor facility components, systems, or structures and on the health and safety of facility personnel and the public.

   iii. Corrective action to be taken to prevent recurrence.

The report shall be reviewed by the Radiation Safety Committee and any follow-up report shall be submitted to the Nuclear Regulatory Commission when authorization is sought to resume operation.

6.6 Action to be Taken for Reportable Events (other than SL Violation)

In case of a Reportable Event (other than violation of a Safety Limit), as defined by section 1.22 of these specifications, the following action shall be taken:

a. Reactor conditions shall be returned to normal or the reactor shall be shutdown. If it is necessary to shutdown the reactor to correct the occurrence, operations shall not be resumed unless authorized by the Associate Director of the Nuclear Reactor Program, or his designated alternate.

b. The occurrence shall be reported to the Associate Director of the Nuclear Reactor Program, and to the Nuclear Regulatory Commission in accordance with specification 6.7.1

c. The occurrence shall be reviewed by the Radiation Safety Committee at their next scheduled meeting.

6.7 Reporting Requirements

6.7.1 Reportable Event

For Reportable Events as defined by section 1.22 of these specifications, there shall be a report not later than the following work day by telephone to the Nuclear Regulatory Commission Operations Center followed by a written report within 14 days that describes the circumstances of the event.

6.7.2 Permanent Changes in Facility Organization

Permanent changes in the facility organization involving either Level 1 or 2 personnel (refer to specification 6.1) shall require a written report within 30 days to the Nuclear Regulatory Commission Document Control Desk.

6.7.3 Changes Associated with the Safety Analysis Report

Significant changes in the transient or accident analysis as described in the Safety Analysis Report shall require a written report within 30 days to the Nuclear Regulatory Commission Document Control Desk.

6.7.4 Annual Operating Report

An annual operating report is required to be submitted no later than August 31st of each year and will cover the period of July 1st through June 30th. The report is transmitted to the Document Control Desk, Nuclear Regulatory Commission, Washington. The annual report shall contain as a minimum, the following information:

a. A brief narrative summary:

   i. Operating experience including a summary of experiments performed.

   ii. Changes in performance characteristics related to reactor safety that occurred during the reporting period

   iii. Results of surveillance, tests and inspections.

b. Tabulation of the energy output (in megawatt days) of the reactor, hours reactor was critical, and the cumulative total energy output since initial criticality.

c. The number of emergency shutdowns and unscheduled SCRAMs, including reasons therefore, and corrective actions.

d. Discussion of the corrective and preventative maintenance operations performed during the period, including the effect, if any, on the safety of operation of the reactor.

e. A brief description, including a summary of the analyses and conclusions of changes in the facility or in procedures and of tests and experiments carried out pursuant to Section 50.59 of 10 CFR.

f. A summary of the nature and amount of radioactive effluent released or discharged to the environs beyond the effective control of the licensee as measured at or prior to the point of such release or discharge, including:

Liquid Waste (summarized by quarter)

i. Radioactivity released during the reporting period:

(1) Number of batch releases.

(2) Total radioactivity released (in microcuries).

(3) Total liquid volume released (in liters).

(4) Diluent volume required (in liters).

(5) Tritium activity released (in microcuries).

(6) Total (yearly) tritium released.

(7) Total (yearly) activity released.

ii. Identification of fission and activation products:

Whenever the undiluted concentration of radioactivity in the waste tank at the time of release exceeds 2×10^{-5} μCi/ml, as determined by a gross beta-gamma count of the dried residue of a one liter sample, a subsequent analysis shall also be performed prior to release for principle gamma emitting radionuclides. An estimate of the quantities present shall be reported for each of the identified nuclides.

iii. Disposition of liquid effluent not releasable to the sanitary sewer system:

Any waste tank containing liquid effluent failing to meet the requirements of 10 CFR 20, Appendix B, reported hereunder, to include the following data:

(1) Method of disposal.

(2) Total radioactivity in the tank (in microcuries) prior to disposal.

(3) Total volume of liquid in tank (in liters).

(4) The dried residue of a one liter sample shall be analyzed for the principal gamma-emitting radionuclides. The identified isotopic composition with estimated concentrations shall be reported. The tritium content shall be included.

Gaseous Waste (summarized on a monthly basis)

i. Radioactivity discharged during the reporting period (in curies) for:

(1) Gases

(2) Particulates, with half lives greater than eight days.

ii. The AEC used and the estimated activity (in curies) discharged during the reporting period, by nuclide, for all gases and particulates based on representative isotopic analysis. (AEC values are given in 10 CFR 20, Appendix B, Table 2.)

Solid Waste

i. The total amount of solid waste packaged (in cubic feet).

ii. The total activity involved (in curies).

iii. The dates of shipment and disposition (if shipped off-site).

g. A summary of radiation exposures received by facility personnel and visitors, including pertinent details of significant exposures.

h. A summary of the radiation and contamination surveys performed within the facility and significant results.

i. A description of environmental surveys performed outside the facility.

6.8 Retention of Records

Records and logs of the following items, as a minimum, shall be kept in a manner convenient for review and shall be retained as detailed below. In addition, any additional federal requirement in regards to record retention shall be met.

a. Records to be retained for a period of at least five (5) years:

   i. Normal plant operation and maintenance.

   ii. Principal maintenance activities.

   iii. Reportable events.

   iv. Equipment and components surveillance activities.

   v. Experiments performed with the reactor.

   vi. Changes to Operating Procedures

   vii. Audit summaries

   viii. RSC and RSAC meeting minutes

b. Records to be retained for the life of the facility:

   i. Gaseous and liquid radioactive waste released to the environs.

   ii. Results of off-site environmental monitoring surveys.

   iii. Radiation exposures for all PULSTAR personnel.

   iv. Results of facility radiation and contamination surveys.

   v. Fuel inventories and transfers.

   vi. Drawings of the reactor facility.

c. Records to be retained for at least one training cycle:

   i. Records of retraining and requalification of certified operating personnel shall be maintained at all times the individual is employed, or until the certification is renewed.

STRIKE OUT PAGES

6.2 Review and Audit

6.2.1 Radiation Safety Committee and Reactor Safety and Audit Committee

The Radiation Safety Committee (RSC) has the primary responsibility to ensure that the use of radioactive materials and radiation producing devices, including the nuclear reactor, is conducted in the safest possible manner with the minimum effect on members of the University community and the general public. The RSC exercises oversight over the University Radiation Protection Program and performs final review of the actions of the Reactor Safety and Audit Committee (RSAC).

RSAC has the primary responsibility to assist the RSC in ensuring that the reactor is operated in compliance with the facility license and all applicable regulations. RSAC performs an annual audit of the operations and performance of the reactor program.

6.2.2 RSC and RSAC Composition and Qualifications

a. RSC shall consist of at least five voting members from the general faculty who are actively engaged in teaching/research involving radioactive materials ~~or radiation emitting devices. Additionally, two members from the Nuclear Engineering Department/Nuclear Reactor Program will be permanent members.~~ for terms of at least three years, no more than two permanent members from the line organization given in Figure 6.1-1, and at least one permanent member from the Radiation Safety Division of the Environmental Health and Safety Center. Non-faculty members who are knowledgeable in nuclear science or radiation safety fields may also ~~be voting members.~~ serve as members for terms of at least three years. Requirements for membership and appointments to this the committee are made by the University through the office of the Vice Chancellor for Finance and Business and the Provost.

b. RSAC shall consist of at least five persons who have expertise in one or more of the component areas of nuclear reactor safety. These include Nuclear Engineering, Nuclear Physics, Health Physics, Electrical Engineering, Chemical Engineering, Material Engineering, Radiochemistry, and Nuclear Regulatory Affairs. At least three of the members are appointed from the general faculty. These faculty members shall be constituted as follows: Director of the Nuclear Reactor Program shall serve as a permanent member, one member from an appropriate discipline within the College of Engineering, and one member from the general faculty. Appointments are for three years. The remaining RSAC members are the Reactor Health Physicist and a member from the Radiation Safety Division of the Environmental Health and Safety Center who serve as permanent members. An additional member may represent an outside nuclear related agency. At the discretion of RSAC, specialist from other universities and outside establishments may be invited to assist in its appraisals.

c. A quorum shall consist of not less than a majority of the full RSC or RSAC and shall include the chairman or his designated alternate. Members from the line organization shown in Figure 6.1-1 shall not form a quorum.

6.3 Operating Procedures

6.3.1 Written Procedures

Written procedures shall be prepared, reviewed and approved prior to initiating any of the following:

a. Startup, operation and shutdown of the reactor.

b. Fuel loading, unloading, and movement within the reactor.

c. Maintenance of major components of systems that could have an affect on reactor safety.

d. Surveillance checks, calibrations and inspections required by the technical specifications or those that may have an affect on reactor safety.

e. Personnel radiation protection, consistent with applicable regulations and that include commitment and/or programs to maintain exposures and releases as low as reasonably achievable (ALARA).

f. Administrative controls for operations and maintenance and for the conduct of irradiations and experiments that could affect reactor safety or core reactivity.

Substantive changes to the above procedures shall be made effective only after documented review by the RSC (or RSAC as applicable) and approval by the Associate Director of the Nuclear Reactor Program, or his designated alternate.

Minor modifications to the original procedures which do not change their original intent may be made by the Reactor Operations Manager, but the modifications shall be approved by the Associate Director of the Nuclear Reactor Program within 14 days.

Temporary deviations from procedures may be made by the Senior Reactor Operator (on duty as required by specification 6.1.2 c.) or Reactor Operations Manager, in order to deal with special or unusual circumstances or conditions. Such deviations shall be documented and reported to the Associate Director of the Nuclear Reactor Program, or his designated alternate.

6.3.2 Emergency Plan and Implementing Procedures

a. The Emergency Plan is approved by the Associate Director of the Nuclear Reactor Program, ~~RSAC~~ RSC (or RSAC as applicable), and forwarded to the Nuclear Regulatory Commission.

ATTACHMENT 1

9 January 2001

Attachment 1
Summary of Proposed Technical Specification (TS) Changes

All changes made to TS are summarized below:

Page	TS No.	Change
24	3.7	"Radiation Protection Committee (RPC)" was renamed as the "Radiation Safety Committee (RSC)".
24	3.7	Letter "g" was replaced with letter "f", since "f" was inadvertently omitted previously.
25	3.7	"Radiation Protection Committee (RPC)" was renamed as the "Radiation Safety Committee (RSC)" in the Bases for TS 3.7.
46	6.1.1	"Radiation Protection Committee (RPC)" was renamed as the "Radiation Safety Committee (RSC)" in Level 3 and Reactor Health Physicist sections.
48	6.1	"Radiation Protection Committee (RPC)" was renamed as the "Radiation Safety Committee (RSC)" in Figure 6.1-1.
49	6.2.1	"Radiation Protection Committee (RPC)" was renamed as the "Radiation Safety Committee (RSC)".
49	6.2.2(a)	Numerous changes were made and include the following: • Changes to the membership of the RSC • Deletion of the staggered 3 year terms on the RSC • Addition of two members from the NE Department/NRP to the RSC • Deleted the phrase "Less than a majority of the RPC members shall be from the line organization presented in Figure 6.1-1." • Voting membership was changed
49	6.2.2(b)	Appointment recommendation for RSAC members from the RSC was dropped because all faculty and staff committee appointments are issued by the University. "Radiation Protection Division (RPD)" was renamed as the "Radiation Safety Division (RSD)".
	6.2.2(c)	"Radiation Protection Committee (RPC)" was renamed as the "Radiation Safety Committee (RSC)".
50	6.2.2(d)	"Radiation Protection Committee (RPC)" was renamed as the "Radiation Safety Committee (RSC)". Audit meetings were dropped since the RSAC Chairman may call a meeting for any purpose, including the annual audit.
	6.2.3	"Radiation Protection Committee (RPC)" was renamed as the "Radiation Safety Committee (RSC)".
51	6.2.4	"Radiation Protection Committee (RPC)" was renamed as the "Radiation Safety Committee (RSC)".

Attachment 1
Summary of Proposed Technical Specification (TS) Changes

Page	TS No.	Change
52,53	6.3	Section 6.3 of the current TS was separated into TS 6.3.1, 6.3.2, and 6.3.3. TS 6.3.1 deleted the current TS 6.3(g). TS 6.3.2 was added for the Emergency Plan and Implementing Procedures. TS 6.3.3 was added for the Physical Security Plan and Implementing Procedures.
54	6.4.1	"Radiation Protection Committee (RPC)" was renamed as the "Radiation Safety Committee (RSC)".
	6.4.2	"Radiation Protection Committee (RPC)" was renamed as the "Radiation Safety Committee (RSC)".
55	6.5	"Radiation Protection Committee (RPC)" was renamed as the "Radiation Safety Committee (RSC)".
56	6.6	"Radiation Protection Committee (RPC)" was renamed as the "Radiation Safety Committee (RSC)".
53	6.3.3	New page number
54	6.4	New page number
55	6.5	New page number
56	6.6	New page number
57	6.7	New page number
58	6.7	New page number
59	6.7	New page number
60	6.8	New page number. "Radiation Protection Committee (RPC)" was renamed as the "Radiation Safety Committee (RSC)".

Attachment 1
Justification of Proposed Technical Specification (TS) Changes

Most of the proposed changes are associated with renaming of the "Radiation Protection Committee" to the "Radiation Safety Committee". Other proposed TS changes include the following:

1. Correction of typographic error
2. Page alignment and spacing
3. Membership of the Radiation Safety Committee
4. Staggered terms of Radiation Safety Committee members
5. Voting status of Radiation Safety Committee members
6. Recommendation for membership of the Reactor Safety and Audit Committee
7. Meeting frequency of the Radiation Safety Committee
8. Review and approval of the Emergency Plan and implementing procedures
9. Review and approval of the Physical Security Plan and implementing procedures

The following reasons support the proposed TS changes:

- Renaming of the "Radiation Protection Committee" to the "Radiation Safety Committee" and "Radiation Protection Division" to the "Radiation Safety Division" resulted in numerous changes to TS. No change was made regarding the function or responsibility of these groups. The name changes were approved by the then named Radiation Protection Committee as part of the revised University Radiation Safety Manual.

  Affected TS: 3.7, 6.1.1, Figure 6.1-1, 6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.4.1, 6.4.2, 6.5, 6.6, and 6.8

1. Current TS 3.7 list items "a" through "e" and "g". TS 3.7 item "f" is not listed. Proposed TS 3.7 corrects this typographical error by replacing "g" with "f".

   Affected TS: 3.7

2. Several pages in the proposed TS were renumbered based on page alignment and spacing.

   Affected pages: 53, 54, 55, 56, 57, 58, 59, 60

3. TS 6.2.2 (a) has been reworded for clarification and is given in item 5 below. Associated with the name changes discussed above was a revision of the University Radiation Safety Manual. This manual is used to address requirements given in State of North Carolina and US NRC licenses issued to the University. The revised University Radiation Safety Manual contains the requirements for the Radiation Safety Committee (RSC). Wording of the current TS 6.2.2 (a) was taken from the previous revision of the University Radiation Safety Manual. Rather than restate the wording from the revised University Radiation Safety Manual, the proposed TS 6.2.2 (a) was reworded to ensure that the line organization given in Figure 6.1-1 could not form a quorum as stated in TS 6.2.2 (c) and to ensure representation by personnel knowledgeable about the nuclear reactor facility and radiation safety on the RSC..

   Affected TS: 6.2.2 a

Attachment 1
Justification of Proposed Technical Specification (TS) Changes

4. Staggering of RSC membership was deleted as a requirement in the proposed TS 6.2.2 (a) and is consistent with TS 6.2.2 (b). Having members with the appropriate qualifications is required to ensure that the RSC review and approval functions as given in TS 6.2.3 are met. Also, it is noted that with the number of general faculty members and permanent members on RSC, the likelihood of a completely new RSC membership with no prior experience seems remote.

   Affected TS: 6.2.2 a

5. The proposed TS 6.2.2 (a) is revised as follows to clarify RSC membership and terms of service. Statements about voting privileges have been deleted.

   " RSC shall consist of at least five members from the general faculty who are actively engaged in teaching/research involving radioactive materials for terms of at least three years, no more than two permanent members from the line organization given in Figure 6.1-1, and at least one permanent member from the Radiation Safety Division of the Environmental Health and Safety Center. Non-faculty members who are knowledgeable in nuclear science or radiation safety fields may also serve as members for terms of at least three years. Requirements for membership and appointments to the committee are made by the University through the office of the Vice Chancellor for Finance and Business and the Provost."

   TS 6.2.2 (a) was reworded to ensure that members from the line organization would serve on the RSC and could not form a quorum as required by TS 6.2.2 (c).

   Statements about member voting privileges were deleted in this proposed TS as revised and is consistent with TS 6.2.2 (b). All members of RSC and RSAC have voting privileges. Furthermore, the members from the line organization would be a minority of the quorum based on the proposed TS 6.2.2 (a) as revised. The minimum full membership of the RSC would be eight members and the minimum quorum would be five members by this proposed TS as revised. Approval of reactor related items would always require the support of RSC members other than those from the line organization.

   Representation on the RSC by the line organization, representation on the RSC by the Radiation Safety Division, and RSC term duration of at least three years for the general faculty and non-faculty members were added for consistency with TS 6.2.2 (b).

   Affected TS: 6.2.2 a

6. The RSC recommendation of RSAC membership was deleted in proposed TS 6.2.2 (b). Having RSAC members with the appropriate qualifications is required to ensure that the RSAC review and approval functions as given in TS 6.2.3 are met.

   Affected TS: 6.2.2 b

Attachment 1
Justification of Proposed Technical Specification (TS) Changes

7. Meeting frequency of the Radiation Safety Committee was changed to quarterly, not to exceed six months in proposed TS 6.2.2 (d). Also, meetings of the Radiation Safety Committee or Reactor Safety and Audit Committee (RSAC) was changed to include call by the Chair in proposed TS 6.2.2 (d). The meeting of RSAC for the audit function was deleted since the Chair of RSAC has the option to call a meeting for any legitimate reason, including the audit required by TS 6.2.3 and 6.2.4. Quarterly meeting frequency for RSC is permitted by the State of North Carolina Regulations for Protection Against Radiation and is consistent with the RSAC meeting frequency given in the current TS 6.2.2 (d). More frequent meetings may be called by the Chair of RSC and RSAC as necessary to support committee or reactor related items. Reducing the number of meetings has no affect on the extent or amount of RSC or RSAC reviews and approvals of reactor related items.

   Affected TS: 6.2.2 d

8. TS 6.3 was divided into proposed TS 6.3.1, 6.3.2, and 6.3.3. The proposed TS 6.3.1 replaces item "g" with proposed TS 6.3.2 and TS 6.3.3.

   Proposed TS 6.3.2 (a) states how the Emergency Plan is reviewed and implementing procedures are reviewed and approved. Section 10.4.1 of the Emergency Plan discusses revision and updates of the Emergency Plan, which includes review and approval by RSAC and RSC. The Associate Director is designated as the Emergency Director in the Emergency Plan and therefore must approve of changes made to the Emergency Plan. Based on Section 10.4.1 of the Emergency Plan and for consistency with wording given in proposed TS 6.3.1, the proposed TS 6.3.2 (a) is revised as follows:

   "The Emergency Plan is approved by the Associate Director of the Nuclear Reactor Program, RSC (or RSAC as applicable), and forwarded to the Nuclear Regulatory Commission."

   Section 10.4.1 of the Emergency Plan indicates that implementing procedures exist. Appendix C of the Emergency Plan is a list of these implementing procedures. Also, as stated in Section 10.4.1 of the Emergency Plan, the Reactor Health Physicist is responsible for coordinating updates of the Emergency Plan and Procedures.

   One of the implementing procedures provides for the revision of the implementing procedures with approval by the Reactor Health Physicist and the Associate Director of the Nuclear Reactor Program (NRP). Approval by the Reactor Health Physicist was included for consistency of the implementing procedures with the Emergency Plan and consistency of procedure format. Emergency Procedures are not required to be approved by RSC or RSAC for the following reasons:

   - Emergency procedures implement the approved Emergency Plan. Additional implementation items may be included provided that the requirements of the Emergency Plan continue to be met. The audit conducted by RSAC under TS 6.2.3 and TS 6.2.4 (d) include a review of these implementing procedures for agreement with requirements given in the Emergency Plan.

8. continued

- The Emergency Plan and implementing procedures currently in use address general situations and requirements, rather than specific situations at the reactor facility. Based on the emergency, situation specific procedures may be needed as determined by the Emergency Director (Associate Director NRP). Prior approval by RSC or RSAC is not practical for such situations.

Substantive changes, minor modifications, and temporary deviations to the implementing procedures are all considered to be revisions and therefore are controlled by the Associate Director in accordance with the implementing procedure on revisions.

Based on the above discussion, approval of implementing procedures by the Associate Director NRP is required for compliance with the Emergency Plan. This conclusion is stated as TS 6.3.2 (b).

Affected TS: 6.3.1 and 6.3.2

9. The Physical Security Plan is withheld from public disclosure in accordance with NRC regulations and Regulatory Guide 5.59. The Physical Security Plan states that the plan and related procedures are withheld from public disclosure. RSC and RSAC membership is transitory and a majority of the members must come from outside the line organization given in Figure 6.1-1. Review and approval of the Physical Security Plan and implementing procedures is not specifically stated in TS 6.2.3 or TS 6.2.4 as a responsibility of RSC and/or RSAC. Therefore, RSC and RSAC members are considered to be members of the public with regard to the physical security plan and are not in a position in which they "need to know" the content of the physical security plan or its implementing procedures.

The Associate Director is the individual with line responsibility for the safe operation of the facility and therefore is in a "need to know" position regarding the physical security plan and its implementing procedures. Additionally, the Associate Director is the member within the line organization who has the responsibility for ensuring adherence to the physical security plan and its implementing procedures. It is also noted that other personnel who operate and maintain the physical security systems and those who respond to physical security threats are familiar with the plan and implementing procedures, however their approval is not required. Therefore it is concluded that the Associate Director needs to approve and control the Physical Security Plan and its implementing procedures.

Based on the above discussion, approval of the physical security plan and its implementing procedures by the Associate Director NRP is required for fulfillment of the Associate Director responsibilities given in TS. This conclusion is stated as proposed TS 6.3.3 (a) and (b).

Affected TS: 6.3.1 and 6.3.3

Attachment 1
Safety Review of Proposed Technical Specification (TS) Changes

The proposed TS changes are associated with correction of typographical errors, page spacing, name (title) changes, and administrative changes. Section 11 of the Safety Analysis Report (SAR) is affected by the name changes made by the proposed TS changes. No other sections of the SAR are affected by the proposed TS changes. Specifically, none of the proposed changes involve changes to equipment/system design or function, method of performing equipment function, probability of occurrence of an accident, consequences of an accident, malfunction of equipment important to safety, or accidents or malfunctions of a different type as previously evaluated in the SAR. Only editorial changes are made to the bases of TS 3.7. No other bases to TS are involved in the proposed TS changes. The proposed TS changes as revised are consistent with the approved Emergency Plan, Physical Security Plan, and updated SAR.

The following statements are made regarding the impact on safety:

- Changes to correct typographical errors and page spacing are editorial in nature and have no affect on safety.

- Changes to name (title) of the Radiation Safety Committee and Radiation Safety Division have not resulted in changes to the function and responsibility for either of these organizations. Section 11 of the SAR will be updated to reflect these name changes. Therefore, it is concluded that there is no affect on safety associated with these name (title) changes.

- Other proposed changes are administrative in nature and do not involve any changes to the function, responsibility, or control of the Radiation Safety Committee, Reactor Safety and Audit Committee, or Radiation Safety Division. Approval of the Physical Security Plan and its implementing procedures and the implementing procedures for the Emergency Plan by the Associate Director is consistent with TS 6.1, 6.2, and 6.3. Therefore, these administrative changes have no affect on safety.

It is concluded that the proposed changes are consistent with the SAR as updated and do not reduce or compromise safety.