

INTERIM STAFF GUIDANCE ON STREAMLINED REVIEW PROCESS FOR LICENSE RENEWAL FOR RESEARCH REACTORS

Introduction

In SECY-08-0161, "Review of Research and Test Reactor License Renewal Applications," dated October 24, 2008 (ADAMS accession number ML082550140), the staff provided the Commission with plans to improve the review of license renewal applications for research and test reactors (RTRs). The staff requirements memorandum (SRM) for SECY-08-0161 was issued on March 26, 2009 (ADAMS accession number ML090850159). The SRM directs the staff to streamline the RTR renewal process using some combination of the options presented in SECY-08-0161. The staff is also directed to focus the streamlined renewal process on the most safety significant aspects of the license renewal application. In addition, the SRM says the staff should implement a graded approach whose scope is commensurate with the risk posed by each facility and use risk insights from the RTR security assessments to inform the establishment of a dose threshold as a measure of risk. The graded approach should incorporate elements of the alternative safety review approach discussed in Enclosure 1 of SECY-08-0161. In the alternative safety review approach, the staff considers the results of past NRC staff reviews when determining the scope of the review. A basic requirement from the SRM is that licensees must be in compliance with applicable regulatory requirements.

The purpose of this guidance is to present a streamlined review process that the staff will apply to license renewal applications in the backlog in accordance with Commission and management direction. This guidance is a change in process for those licensees that will undergo a "focused review" which will be described in detail below.

This guidance is based on the RTR license application format and content guidance and standard review plan (SRP) found in NUREG-1537, "Guidelines for the Preparing and Reviewing Applications for the Licensing of Non-Power Reactors."

General Approach to the Streamlined Review Process for License Renewal

In keeping with the Commission's direction, a graded approach based on licensed power level determines the license renewal process applied to each licensee. Facilities are divided into two tiers. Facilities with licensed power levels 2 MW(t) and greater undergo a full review using the SRP. Facilities with licensed power less than 2 MW(t) undergo a review that focuses on the most safety significant aspects of the renewal application and considers past reviews performed by the NRC staff.

A power level of 2 MW(t) or greater is a long-standing regulatory demarcation of risk. This power level is used in the inspection program to define Class I reactors where the staff completes the inspection program on an annual cycle rather than biennially as is the case for reactors with a power level less than 2 MW(t). In addition, these facilities also have emergency planning zones that extend beyond the facility boundary, as is customary for lower powered RTRs. This demarcation also recognizes that fission product inventories increase with power level. Fission product inventory is related to potential dose during accident conditions. This demarcation is also consistent with insights gained from the RTR security assessments. Reactors at or above this power level have enhanced security requirements and need to protect against sabotage in accordance with 10 CFR 73.60(f).

Focused License Renewal Review

For reactors with power levels less than 2 MW(t), the primary focus of the review is on the sections of the safety analysis report (SAR) that are most significant to safety:

- reactor design and operation,
- accident analysis, and
- technical specifications (TSs).

The staff will also review radiation protection and waste management programs and financial requirements. The radiation protection and waste management programs review will include the results of the RTR inspection program.

Applicable sections of the SRP will be used to perform the review. The attachment, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors, Part Two, Standard Review Plan And Acceptance Criteria, Focused License Renewal Review," (focused review plan) provides guidance to the NRC reviewer about using the SRP to conduct a focused review. An environmental assessment (EA) will also be performed to meet the requirements of 10 CFR Part 51.

The reactor design and operation review will focus on Chapter 4 of the SAR, which includes reactor core, reactor fuel, control rods, neutron moderator and reflector, normal operating conditions such as shut down margin and excess reactivity, core physics parameters, operating limits and thermal-hydraulic design. Some reviews may require development of independent neutronic and thermal-hydraulic models by the NRC staff to verify the licensee's analysis. The accident analysis section, Chapter 13 of the SAR includes evaluation of the maximum hypothetical accident (MHA), and if applicable to the design under review, insertion of reactivity, loss of coolant, loss of flow, mishandling of fuel, experiment malfunction, loss of electrical power and external events.

Accident evaluation has the potential to involve the partial review of other chapters in the SAR, for example, engineered safety features (ESFs) if credited to mitigate the consequences of an accident scenario.

The TSs review is based on the guidance of Chapter 14 of the SRP and the American National Standard ANS-15.1-2007, "The Development of Technical Specifications for Research Reactors." The TSs review will ensure compliance with 10 CFR 50.36. The review of the TSs and bases may involve sections of many chapters of the SAR. However, the depth of review of these other SAR chapters will only be that needed to confirm the proposed TSs are acceptable and have sufficient bases.

Except as needed to accomplish the review of the focus areas discussed above, the staff will not conduct an in-depth review of site characteristics, design of structures, systems, and components, reactor coolant systems, instrumentation and control systems, electrical power systems, auxiliary systems, experimental facilities and programs, and conduct of operations. Generally, these areas have been reviewed by the NRC staff in the past, either as part of the initial licensing review for the facility or as part of a past license renewal and found acceptable. Any changes in these areas outside of the scope of the current focused review made since the last NRC initial or renewal review may have been reviewed by NRC as part of a license

amendment or were made under the authority of the regulations in 10 CFR 50.59. The licensee's process for conducting 10 CFR 50.59 reviews was inspected by the NRC and the technical evaluations were screened by the facility project manager.

Because the focused review does not cover all areas of the SAR, the NRC reviewer will need to ascertain if the licensee has requested any changes in the renewal SAR to the facility outside of the areas of the focused review. A request for additional information (RAI) should be sent to the licensee asking the licensee to identify changes, if any, outside of Chapter 4, 13, and 14 of the SAR (e.g., power uprates). If any changes are identified by the licensee, a decision will be made on a case-by case basis if the staff will review and approve the changes as part of license renewal or if a separate license amendment request will be required.

The license renewal reviews will meet the requirements of the National Environmental Policy Act (NEPA). An EA is required by 10 CFR 51.21, "Criteria for and identification of licensing and regulatory actions requiring environmental assessments," for research reactor license renewal. Because of the low power levels of research reactors and consequent low water usage and heat dissipation, the EA review is focused on radiological environmental impacts. These include gaseous, liquid, and solid wastes and potential doses to members of the public and facility personnel from routine operations and accidents. A review of routine releases from the facility from Chapter 11 SAR may need to be performed as part of the EA.

Regulations Applicable to License Renewal

The following are the regulatory requirements for the RTR license renewal process, paraphrased for brevity:

- 10 CFR 50.30, "Filing of Application for Licenses; Oath and Affirmation" - Paragraph (f) requires an environmental report in the license renewal application for a test reactor but not for a research reactor.
- 10 CFR 50.32, "Elimination of Repetition" - This allows the applicant to incorporate by reference information filed previously.
- 10 CFR 50.33, "Contents of Applications; General Information" - There are three major requirements of this citation:
 - Paragraphs (a) through (e) require information regarding identity, citizenship, affiliation, and proposed use.
 - Paragraph (f) requires financial information to demonstrate that the applicant can support operation of the RTR facility for the duration of the license period.

Note: 10 CFR Part 50, Appendix C, "A Guide for the Financial Data and Related Information Required to Establish Financial Qualifications for Construction Permits and Combined Licenses," makes one reference to 50.33(f); no section of 10 CFR Part 50 references 10 CFR Part 50, Appendix C. The first sentence of 10 CFR Part 50, Appendix C restricts its RTR application to test reactors; it does not apply to a research reactor.

- Paragraph (k) requires a report pursuant to 10 CFR 50.75 giving assurance that funds will remain available for decommissioning the facility.
- 10 CFR 50.34, “Contents of Applications; Technical Information” - The relevant parts pertaining to license renewal applications for RTRs are the following:
 - Paragraph (b) requires a Final Safety Analysis Report (FSAR), the content of which is defined in the following subparts of the regulation, being similar to those specified in the RTR SRP:
 - 1. results of environmental and meteorological monitoring programs
 - 2. analysis of structures, systems, and components (SSC)
 - 3. radioactive material inventory, effluents, and limiting exposure
 - 4. analysis and evaluation of SSCs and ECCS
 - 6. facility operation, including:
 - organizational structure
 - personnel qualifications
 - management and administrative controls
 - conduct of operations including maintenance, surveillance, and periodic testing of SSCs
 - emergency plans pursuant to Appendix E
 - proposed technical specifications pursuant to 10 CFR 50.36
 - 7. technical qualifications of the applicant
 - 8. reactor operator requalification program pursuant to 10 CFR 55.59
 - Paragraph (c) requires a Physical Security Plan.
 - Paragraph (e) requires the protection of Safeguards Information.
- 10 CFR 50.40, “Common Standards [Standards for Licenses, Certificates, and Regulatory Approvals],” states that in issuing an operating license the Commission will be guided by the following considerations:
 - Paragraph (a) requires a finding that... “the processes to be performed, the operating procedures, the facilities and equipment, the use of the facility, and other technical specifications ...collectively provide reasonable assurance that the applicant will comply with the regulations in this chapter, including the regulations in part 20 of this chapter, and that the health and safety of the public will not be endangered.”
 - Paragraph (b) requires a finding that “The applicant ...is technologically and financially qualified....”
 - Paragraph (c) requires a finding that the issuance of an operating license will not in the opinion of the Commission be inimical to the common defense and security or to the health and safety of the public.
 - Paragraph (c) requires a finding that the requirements of 10 CFR Part 21 be met.
- 10 CFR 50.41, “Additional Standards for Class 104 Reactors,” adds that in the case of class 104 licenses [RTR licenses} the Commission will permit the widest amount of effective medical therapy possible and will permit the conduct of widespread and diverse research and development.

- 10 CFR 50.54, “Conditions of Licenses,” states that each license will be issued for a fixed period of time, not to exceed 40 years, and may be renewed by the Commission upon expiration of the period.
- 10 CFR 50.64, “Limitations on the use of Highly Enriched Uranium (HEU) in Domestic Non-power Reactors,” does not allow construction of a non-power reactor using HEU other than a unique purpose reactor and states conversion implementation requirements for existing HEU-fuelled reactors.
- 10 CFR 50.58, “Hearings and Report of the Advisory Committee on Reactor Safeguards [AC RS]” - The license renewal application for a test reactor must go before the ACRS but not a research reactor license renewal application.
- 10 CFR 50.91, “Notice for Public Comment; State Consultation,” states requirements for public notices regarding amendments of test reactor licenses. It does not apply to research reactors.
- 10 CFR 51.20, “Criteria for and Identification of Licensing and Regulatory Actions Requiring Environmental Impact Statements” - Paragraph (b) (2) requires an EIS for a test reactor license renewal application.
- 10 CFR 51.21, “Criteria for and Identification of Licensing and Regulatory Actions Requiring Environmental Assessments” - EAs are prepared as a part of the research reactor license renewal application process.

Considerations of Exemptions to Regulations

At the present time in drafting the ISG, the authors find that the streamlined process as defined can be accomplished within existing regulations; there is no need to seek an exemption to any regulation. Nevertheless, consideration has been given to the means and justification for an exemption in the event that (1) the scope of the proposed streamlined review process is further reduced or (2) others in the ISG review process determine that the streamlined review process as proposed falls short of the minimum requirements of the regulations. Therefore, this section of the document will either be eliminated or substantially modified for the final ISG document.

The primary requirements pertaining to the contents of license renewal applications are stated in Sections 10 CFR 50.33 and 50.34, with very little distinction between the contents of an application for an initial license and an application for renewal of an existing license. As a result, the regulations require re-submittal of much information that has been previously submitted and reviewed.

The provisions of 50.32, “Elimination of Repetition,” have not been widely exercised by RTRs for a number of reasons; prior to publication of NUREG-1537 in 1996 there was no SRP for RTR licensees to use as guidance regarding the content of a license renewal application, some licensees found it easier to update and resubmit a decades-old SAR than to develop a new document, and there was no requirement for RTR licensees to maintain an updated SAR.

This ISG addresses the short-term plan for processing the backlog of license renewal applications for RTRs. Independently, a long-term plan is being prepared to pursue improvements in the license renewal process that are outside the scope of the short-term plan. The ISG proposed to implement the short-term plan is considered sufficient to meet all legal requirements while finding reasonable assurance of adequate protection of public health and safety and protection of the environment while protecting common defense and security.

Paragraph (a) of 10 CFR 50.12, "Specific Exemptions," allows the Commission to grant exemptions that are authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security; one of the following special circumstances must exist:

- (i) Application of the regulation conflicts with other rules or requirements.
- (ii) Application of the regulation would not serve the purpose or is not necessary to achieve the purpose of the rule or regulation.
- (iii) Compliance would result in hardship or costs not contemplated earlier.
- (iv) The benefit of the exemption to public health and safety compensates any resulting decrease in safety.
- (v) The exemption would provide only temporary relief and the licensee has made good faith efforts to comply
- (vi) A circumstance not considered when the regulation was adopted makes an exemption in the public interest.

For the regulations addressed in the previous section from which exemptions may be considered, it appears that they may be justified under provisions of 10 CFR 50.12(a)(ii), (iii), (iv), and (vi), especially when considering that the bases for the exemption already exists in a regulation (10 CFR 50.32, "Elimination of Repetition") and the precedence of a regulation for nuclear power reactors (10 CFR Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants.")

Use of Past NRC Licensing Reviews

Washington State University, Texas A&M TRIGA, University of Florida, and Purdue University have converted their reactors from high-enriched uranium (HEU) fuel to low enriched uranium (LEU) fuel. The reviews of the applications for conversion covered a substantial part of Chapters 4 and 13 of the SAR and the safety evaluation reports (SERs) can be used directly in the renewal SER. The conversion SER for license conditions and TSs impacted by the conversion can also be used for the license renewal if the licensee has proposed no changes in that area. Additional information is given in applicable sections of the focused review plan.

Some sections of the focused review plan give the reviewer the option of using the last NRC review to assist in the review of the section. The past NRC review, unless identified as a HEU

to LEU conversion in the focused review plan, is either the last license renewal, or for those facilities where this is the first license renewal, the initial licensing review. License renewals performed since the early 1980s have complete SERs, usually in the form of a NUREG-series document whose use may increase review efficiency. For those facilities where the last NRC review was the initial licensing dating back to the 1950s or 1960s, the AEC staff review was usually a concise document that may not contain sufficient detail to allow the reviewer to reach clear conclusions. In this case, the reviewer may find it more efficient to perform a review based on the SAR.

Treatment of License Renewal Applications Already In-Process

Many of the backlogged license renewal applications have undergone some level of NRC staff review. Many of these reviews are at the RAI stage where the staff has asked the licensee a substantial number of questions, many of which are technically complex.

Impacted licensees should be informed by a letter from the staff that work on any outstanding RAIs that has not been answered should be suspended. Some of these RAIs may be out of scope for the focused review. The licensee will receive a new RAI if the focused review identifies the need for additional information. For those outstanding RAIs that will go unanswered because they are not repeated as part of the focused review RAIs, the NRC reviewer may want to prepare a short note to be placed on the docket explaining why the questions have been eliminated.

For those RAIs where the licensee has submitted answers, the NRC staff should review the answers for correct information. If there are answers that NRC believes are incorrect, the NRC reviewer can follow-up with the licensee and ask the question as part of the focused review RAIs. This will prevent incorrect information from remaining uncorrected on the docket. The staff may decide not to include discussions out of scope RAIs in the SER.

Opportunity for Hearing

If notice has appeared in the *FEDERAL REGISTER* giving interested parties an opportunity for hearing on a license renewal application, the application does not need to be re-noticed because of the introduction of the streamlined review process. The streamlined review process does not change the contents of any license renewal application previously submitted and therefore should not impact the scope of issued *FEDERAL REGISTER* notices for license renewal applications.

Members of the public will be made aware of this streamlined review process, have opportunity to comment, and comments will be evaluated by the staff. Comments accepted by the NRC staff will be reflected in the final version of the streamlined review process.

Power Increases

The Dow Chemical Company, University of Utah, Reed College and Purdue University applications for license renewal also contain a request for an increase in licensed power level. The staff will review the license renewal at the increased power level. Because the requested power increase has the potential to impact almost all chapters of the SAR, these applications will undergo a complete review in accordance with the SRP.

Format of Renewal Safety Evaluation

Report

The conclusions of the focused review will be documented in a Safety Evaluation Report (SER) in much the same way as is currently done for the conclusions of a full review done under the SRP (NUREG-1537) with the exception that the traditional 18 chapter version will be reduced to a 6 chapter version SER as follows:

- | | | |
|-----------|--------------------------|---|
| Chapter 1 | Introduction | (Similar to current Chapter 1) |
| Chapter 2 | Reactor | (Similar to current Chapter 4) |
| Chapter 3 | Technical Specifications | (Contains a detailed discussion of TSs and basis) |
| Chapter 4 | Accident Analysis | (Similar to current Chapter 13) |
| Chapter 5 | Conclusions | (Similar to current Chapter 17) |
| Chapter 6 | References | (Similar to current Chapter 18) |

DRAFT

**FOCUSED REVIEW PLAN
NUREG-1537**

**GUIDELINES FOR PREPARING AND
REVIEWING APPLICATIONS FOR THE LICENSING
OF NON-POWER REACTORS**

PART TWO

**STANDARD REVIEW PLAN AND
ACCEPTANCE CRITERIA**

MAY 2009

The following sections match the chapters in the SRP sections of NUREG-1537.

Many sections of this supplement discuss possible technical specifications (TSs). This discussion is based on the current version of the American Nuclear Society standard on TSs, ANSI/ANS-15.1-2007, "The Development of Technical Specifications for Research Reactors" (ANS-15.1). The licensee may have proposed additional TSs beyond what is discussed in this supplement. The licensee's TSs may also be arranged differently and may be worded differently from the standard. The reviewer needs to consider the TSs in their entirety and use technical judgment to determine if the TSs as proposed by the licensee meets the requirements of the regulations.

A primary conclusion that the NRC reviewer needs to reach is there is reasonable assurance that the activities authorized by the renewed license can be conducted without endangering the health and safety of the public and such activities will be conducted in compliance with the rules and regulations of the Commission. While this is a focused review, it is expected that the NRC reviewer will review the entire SAR. Those review areas outside of the focused review scope are identified. This means that these areas will not be subject to an in-depth review. If the reviewer discovers information in the non-focus areas of the SAR that would prevent the reviewer from reaching the primary conclusion above, the issue should be brought to management for disposition.

1. INTRODUCTION

This chapter of the safety evaluation report (SER) provides an overview of the NRC staff's review. Because Chapter 1 of the safety analysis report (SAR) is an overview or an executive summary of topics covered in detail in other chapters, it is consistent with a focused review for the NRC reviewer to review this chapter for information only and not perform a detailed review. Areas of review important to reaching safety conclusions are discussed in the detailed chapters below. Chapter 1 of the focused SER should follow the format below to provide the reader background information on the facility under review.

1.1 Overview

Section 1.1 of the SAR is an introduction to the SAR. As part of performing a focused review, the NRC reviewer does not need to review this section of the SAR. Section 1.1 of the SER is an overview and introduction to the SER. A template for Section 1.1 of the SER is presented below. Brackets contain review dependent information that the NRC reviewer should address as applicable to the license renewal application under review.

START OF SER SECTION 1.1 TEMPLATE.

1.1 Overview

By letter and supporting documentation dated [PROVIDE DATES], as supplemented, [LICENSEE NAME] ([LICENSEE ACRONYM] or the licensee) submitted to the U.S. Nuclear Regulatory Commission (NRC or the Commission) an application for a 20-year renewal of the Class 104c Facility Operating License No. [LICENSE NUMBER] (NRC Docket No. 50-[DOCKET NUMBER]) for the [REACTOR NAME] ([REACTOR NAME ACRONYM] or the facility).

The regulations in Title 10, Section 50.51(a) of the Code of Federal Regulations (10 CFR 50.51(a)) state that each license will be issued for a period of time to be specified in the license but in no case to exceed 40 years from date-of-issuance. The [LICENSEE NAME] facility license was issued on [PROVIDE DATE], for a period of [PROVIDE NUMBER OF YEARS] years expiring on [PROVIDE DATE]. A renewal would authorize continued operation by issuance of a renewed license for the [PROVIDE TYPE, E.G., TRIGA]-type research reactor facility. The facility is located [PROVIDE BUILDING, BUILDING LOCATION AND CITY, STATE]. Because the request for license renewal was filed in a timely manner, until the staff completes action on the renewal request, the licensee is permitted to continue operation of the [REACTOR NAME] under the terms and conditions of the exiting License in accordance with 10 CFR 2.109, "Effect of Timely Renewal Application."

The NRC staff's (the staff) review, with respect to renewing the [LICENSEE NAME] operating license, was conducted on the basis of information contained in the renewal application as well as supporting supplements and licensee responses to requests for additional information (RAIs). Specifically, the renewal application included the safety analysis report (SAR), an environmental report, Technical Specifications (TSs) [LIST OTHER ASPECTS OF THE APPLICATION – COULD INCLUDE OPERATOR REQUALIFICATION PROGRAM, EMERGENCY PLAN AND SECURITY PLAN]. As part of the review, the staff also reviewed annual reports of facility operation submitted by the licensee and inspection reports prepared by NRC personnel. Several site visits were conducted at the facility to observe facility conditions.

[ADD IF APPLICABLE "With the exception of the physical security plan and emergency plan,"] This material may be examined, and/or copied for a fee, at the NRC's Public Document Room, located at One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland. The NRC maintains an

Agencywide Documents Access and Management System (ADAMS), which provides text and image files of NRC's public documents. Documents related to this license renewal may be accessed through the NRC's Public Electronic Reading Room on the Internet at <http://www.nrc.gov>. If you do not have access to ADAMS, or if there are problems in accessing the documents located in ADAMS, contact the NRC Public Document Room reference staff at 1-800-397-4209, 301-415-4737 or by email to pdr@nrc.gov. [ADD IF APPLICABLE "The physical security plan is protected from public disclosure under 10 CFR 73.21, "Requirements for the Protection of Safeguards Information." OR "The physical security plan is protected from public disclosure under 10 CFR 2.390(d)(1)." AND/OR "The emergency plan is withheld from public disclosure as it is considered Security-Related Information."]

The dates and associated ADAMS accession numbers of the licensee's renewal application and associated supplements are listed in Chapter 6, "References."

In conducting its safety review, the staff evaluated the facility against the requirements of the regulations including 10 CFR Parts 20, 30, 50, 51, and 70; applicable regulatory guides; and relevant accepted industry standards, such as the American National Standards Institute/American Nuclear Society (ANSI/ANS) 15 series. The staff also referred to the guidance contained in NUREG-1537, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors," issued February 1996. Because there are no specific accident-related regulations for research reactors, the staff compared calculated dose values for accidents against the requirements in 10 CFR Part 20, "Standards for Protection against Radiation" (i.e., the standards for protecting employees and the public against radiation).

This license renewal was performed using the NRC's focused review process. In SECY-08-0161, "Review of Research and Test Reactor License Renewal Applications," dated October 24, 2008 (ADAMS accession number ML082550140), the NRC staff provided the Commission with information regarding staff plans to improve the review of license renewal applications for research and test reactors (RTRs). The staff requirements memorandum (SRM) for SECY-08-0161 was issued on March 26, 2009 (ADAMS accession number ML090850159). The SRM directed the staff to streamline the RTR renewal process using some combination of the options presented in SECY-08-0161. The focused review process limits review to the most safety significant aspects of the license renewal application. The SRM directs the staff to implement a graded approach whose scope is commensurate with the risk posed by each facility. The graded approach incorporates elements of the alternative safety review approach discussed in Enclosure 1 of SECY-08-0161. In the alternative safety review approach, the staff considers the results of past NRC staff reviews when determining the scope of the review. A basic requirement, as contained in the SRM, is that licensees must be in compliance with applicable regulatory requirements.

Interim staff guidance (ISG) (ADAMS accession number ML091420066) was developed to assist the NRC staff in the review of license renewal applications

under a focused license renewal approach. A draft of the ISG was made available for public comment. The NRC staff considered public comments in their development of the final ISG. This review was conducted using the final ISG.

The purpose of this safety evaluation report (SER) is to summarize the findings of the safety review of the [LICENSEE NAME REACTOR FACILITY] and to delineate the technical details considered in evaluating the radiological safety aspects of continued operation. This SER provides the basis for renewing the license for operation of the [LICENSEE NAME REACTOR FACILITY] at thermal power levels up to and including [GIVE FACILITY LICENSED POWER LEVEL AND PULSE LIMITS, IF APPLICABLE, E.G., "1.1 megawatt (MW(t)), and short duration power pulses with reactivity insertions not to exceed \$2.55"].

This SER was prepared by [LIST MAJOR NRC CONTRIBUTORS]. [LIST CONTRACTORS THAT CONTRIBUTED TO THE REVIEW, AS APPLICABLE].

END OF SER SECTION 1.1 TEMPLATE.

1.2 Summary and Conclusions on Principal Safety Considerations

This section of the licensee's SAR summarizes the licensee's safety conclusions. The NRC reviewer should confirm that the summary of the licensee's safety conclusions is consistent with the reviewed sections of the SAR. This section of the SER contains the principal staff findings from the review of the licensee's application. A template for Section 1.2 of the SER is presented below. Brackets contain information that is review dependent that the NRC reviewer should address as applicable to the license renewal application under review.

START OF SER SECTION 1.2 TEMPLATE.

1.2 Summary and Conclusions Regarding the Principal Safety Considerations

The staff's evaluation considered the information submitted by the licensee, including past operating history recorded in the licensee's annual reports to the NRC, as well as inspection reports prepared by the NRC staff. [IF THE NRC STAFF USED GENERIC STUDIES DISCUSS HERE, E.G., "In addition, as part of its licensing review of several TRIGA reactors, the staff obtained laboratory studies and analyses of several accidents postulated for the TRIGA-type reactor."] On the basis of this evaluation and resolution of the principal issues reviewed for the [LICENSEE NAME REACTOR FACILITY], the following staff findings were reached:

- The design and use of the reactor structures, and systems and components important to safety during normal operation discussed in Chapter 4 of the SAR, in accordance with the TSs are safe, and safe operation can reasonably be expected to continue.

- The expected consequences of a broad spectrum of postulated credible accidents and a maximum hypothetical accident (MHA) have been considered, emphasizing those that could lead to a loss of integrity of fuel element cladding [AND/OR] a release of fission products. The licensee performed conservative analyses of the most serious credible accidents and the MHA and determined that the calculated potential radiation doses outside the reactor room would not exceed 10 CFR Part 20 doses for unrestricted areas.
- The licensee's management organization, conduct of training, and research activities in accordance with the TSs are adequate to ensure safe operation of the facility.
- The systems provided for the control of radiological effluents when operated in accordance with the TSs are adequate to ensure that releases of radioactive materials from the facility are within the limits of the Commission's regulations and are as low as reasonably achievable (ALARA).
- The licensee's TSs, which provide limits controlling operation of the facility, are such that there is a high degree of assurance that the facility will be operated safely and reliably. There has been no significant degradation of the reactor as discussed in Chapter 4 of the SAR, and the TSs will continue to ensure that there will be no significant degradation of safety-related equipment.
- The licensee has reasonable access to sufficient resources to cover operating costs and eventually to decommission the reactor facility.

[IF THE LICENSEE HAS PROPOSED CHANGES TO THE SECURITY PLAN AS PART OF LICENSE RENEWAL AND THE NRC STAFF HAS REVIEWED THE PLAN AS PART OF LICENSE RENEWAL ADD THIS CONCLUSION]

- The licensee's program for providing for the physical protection of the facility and its special nuclear material complies with the requirements of 10 CFR Part 73, "Physical Protection of Plants and Materials."

[IF THE LICENSEE HAS PROPOSED CHANGES TO THE EMERGENCY PLAN AS PART OF LICENSE RENEWAL AND THE NRC STAFF HAS REVIEWED THE PLAN AS PART OF LICENSE RENEWAL ADD THIS CONCLUSION]

- The licensee maintains an emergency plan in compliance with 10 CFR 50.54(q) and Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," which provides reasonable assurance that the licensee will continue to be prepared to assess and respond to emergency events.

[IF THE LICENSEE HAS PROPOSED CHANGES TO THE REACTOR OPERATOR REQUALIFICATION PLAN AS PART OF LICENSE RENEWAL AND THE NRC STAFF HAS REVIEWED THE PLAN AS PART OF LICENSE RENEWAL ADD THIS CONCLUSION]

- The licensee's procedures for training reactor operators and the plan for operator requalification are acceptable. These procedures give reasonable assurance that the reactor facility will be operated with competence.

On the basis of these findings, the staff concludes that [LICENSEE NAME] can continue to operate the [REACTOR FACILITY], in accordance with the renewed license, without endangering the health and safety of the public, facility personnel, or the environment. The issuance of the renewed license will not be inimical to the common defense and security.

END OF SECTION 1.2 TEMPLATE.

1.3 General Description of the Facility

This section of the SAR is a general description of information found elsewhere in the SAR and is outside the scope of a focused review. The NRC reviewer does not need to perform a detailed review of this section of the SAR.

1.4 Shared Facilities and Equipment

Shared facilities and equipment should be reviewed to the extent they impact the review of the areas of focus; reactor, accident analyses, or the TSs. The reviewer should confirm that the discussion in the area of focus under review is consistent with this section of the SAR. Any SER discussion related to shared facilities and equipment should be in the SER section for the area of focus under review rather than this section.

1.5 Comparison With Similar Facilities

This section of the SAR is outside the scope of a focused review. The NRC reviewer does not need to perform a detailed review of this section of the SAR.

1.6 Summary of Operations

This section of the SAR is a summary of information found elsewhere in the SAR and is outside the scope of a focused review. The NRC reviewer does not need to perform a detailed review of this section of the SAR.

1.7 Compliance With the Nuclear Waste Policy Act of 1982

If the NRC staff has reviewed and documented the licensee's compliance with the Nuclear Waste Policy Act of 1982 in the past, confirm that the SAR shows continued compliance and reference that review. If compliance with the Nuclear Waste Policy Act of 1982 has not been documented by NRC, or the SAR does not indicate continued compliance, follow Section 1.7 of the SRP.

1.8 Facility Modifications and History

This section of the SAR is outside the scope of a focused review. The NRC reviewer does not need to perform a detailed review of this section of the SAR. The reviewer should note modifications since the last renewal or initial licensing if this is the first renewal, and confirm that the focused areas of review are consistent with facility history.

2. SITE CHARACTERISTICS

Most aspects of this chapter of the SAR are outside the scope of a focused review and do not receive a detailed review because they have not changed in a manner that could significantly impact safety since the last NRC review. The detailed staff review of this chapter should be limited to initiating events for accidents discussed in Section 13.1.8, "External Events," and TSs related to site characteristics. For those aspects of site characteristics that contribute to the initiation of external events discussed in Chapter 13, as part of the Chapter 13 review, confirm that the discussion in this chapter and Chapter 13 are consistent. If new initiating events are identified, confirm that they are evaluated in Chapter 13. If attributes of the site are used by the licensee to mitigate the consequences of accidents, such as the dispersion of accident releases, the reviewer should confirm that the discussion in this chapter and Chapter 13 are consistent.

2.1 Geography and Demography

2.1.1 Site Location and Description

There should be a TS on design features for the site (See ANS-15.1 – Section 5.1). The definitions section of the TSs may also contain information on the location of the facility. The NRC reviewer should confirm that the licensed area is clearly defined. The NRC reviewer should confirm that the TSs are consistent with the SAR.

2.1.2 Population Distribution

Dose calculations for members of the public in the accident analysis are performed for the maximum exposed member of the public, at the nearest residence, and at any other location of interest (e.g., a dormitory that is nearer to the reactor than the nearest residence). The NRC reviewer should confirm that the locations used in the accident analysis are consistent with the information in this section of the SAR.

2.2 Nearby Industrial, Transportation, and Military Facilities

As part of the review of Chapter 13, the NRC reviewer should review this section to determine if industrial, transportation or military facilities that can become an initiator of external event accidents are consistent with the accident analyses. It is possible that in the twenty or more years since the last NRC review in this area that new facilities have been constructed. If potential initiators exist, the reviewer should determine if they have the potential to cause an accident at the RTR facility. If it determined that the initiator has the potential to cause an accident, confirm that the licensee has properly considered the information in the external event section of Chapter 13.

2.3 Meteorology

The reviewer should confirm that meteorology was reviewed by the NRC during the last review of the license (either a renewal or the initial licensing) and found acceptable. Meteorology is normally outside of the scope of a focused review and does not need a detailed review because the possibility of a change that could significantly impact safety is small. However, if meteorological attributes of the site are used by the licensee to mitigate the consequences of accidents, such as the dispersion of accident releases, the reviewer should confirm that the discussion in this section and Chapter 13 are consistent.

2.4 Hydrology

The possibility of a change in hydrology occurring that would have safety significance since the last NRC review is remote. For those facilities within the flood plain of a body of water, the NRC reviewer should confirm that the Chapter 13 accident analysis in the SAR does not discuss any changes in hydrology that have occurred since the last NRC review (e.g., construction of a new dam upstream) that could subject the facility to flooding and be a potential external accident initiator. If it is determined that a new initiator has the potential to cause an accident, the reviewer should confirm that the licensee has properly considered the hydrology information in the external event section of Chapter 13.

2.5 Geology, Seismology, and Geotechnical Engineering

The possibility of a change in geology, seismology, and geotechnical engineering occurring that would have safety significance since the last NRC review is remote. The NRC reviewer should confirm that the Chapter 13 accident analysis in the SAR does not discuss geological features that were discovered since the last NRC review (e.g., newly discovered faults) that could be a potential external accident initiator. If it is determined that a new initiator has the potential to cause an accident, the reviewer should confirm that the licensee has properly considered the information in the external event section of Chapter 13.

3. DESIGN OF STRUCTURES, SYSTEMS, AND COMPONENTS

This chapter of the SAR discusses design criteria in a general manner. It also discusses meteorological, water and seismic damage. Most aspects of this chapter of the SAR are outside the scope of a focused review and do not receive a detailed review because they have not changed in a manner that could significantly impact safety since the last NRC review. The detailed staff review of this chapter should be limited to initiating events for accidents discussed in Chapter 13 and TSs related to design of structures, systems, and components. For those aspects of meteorological, water and seismic damage that contribute to the initiation of external events discussed in Chapter 13, as part of the Chapter 13 review, the NRC reviewer should confirm that the discussion in this chapter and Chapter 13 are consistent. If new initiating events are identified, confirm that they are evaluated in Chapter 13.

3.1 Design Criteria

This section of the SAR discusses general design criteria applied to the facility. Specific design criteria, as applicable, will be reviewed as part of the review of SAR sections subject to the

focused review process; therefore, the review except as discussed below.

general design criteria do not need a detailed

This section of the SAR can contain a description of the facility structure (e.g., reactor room or building). There should be design feature TSs for the reactor room or building (see ANS-15.1 – Section 5.1). Sometimes building design features that impact effluent releases are found as limiting conditions for operation. The NRC reviewer should confirm that building design features that should not be changed except as a license amendment are clearly defined. The NRC reviewer should confirm that the TSs are consistent with the SAR.

The licensee may also have proposed TSs that control design changes to the facility by requiring that they be made to original or approved design specifications and that surveillance be performed after replacement, repair or modification (see ANS-15.1 – Section 4).

3.2 Meteorological Damage

This section of the SAR describes the design for the protection from meteorological conditions of facility structures (e.g., buildings and cooling towers), systems (e.g., ventilation systems), and components that are assumed to be operable in the SAR. As discussed in Section 2.3 above, meteorology was reviewed and found acceptable during a past NRC license review. The NRC reviewer should confirm that the ability of the facility to withstand meteorological damage was also reviewed and found acceptable during a past review. As part of the focused review, meteorological damage does not need to be reviewed in detail except if it is discussed by the licensee in the external event section of Chapter 13. In that case, the reviewer should confirm that the discussion here is consistent with that in Chapter 13 and follow Chapter 13 review guidance.

3.3 Water Damage

This section of the SAR describes the site and facility design to protect against water damage of structures, systems, and components assumed to function in the SAR. As discussed in Section 2.4 above, if no new accident initiators have been identified, hydrology was reviewed and found acceptable during a past NRC license review (the NRC reviewer should confirm this). The ability of the facility to withstand water damage was also reviewed and found acceptable (the NRC reviewer should confirm this). As part of the focused review, water damage does not need to be reviewed in detail except if it is discussed by the licensee in the external event section of Chapter 13. In that case, the reviewer should confirm that the discussion here is consistent with that in Chapter 13 and follow Chapter 13 review guidance.

3.4 Seismic Damage

This section of the SAR describes the structures, systems, and components that are required to maintain the necessary safety function if a seismic event should occur, as well as the required facility seismic design criteria. As discussed in Section 2.5 above, if no new accident initiators have been identified, geology, seismology, and geotechnical engineering was reviewed and found acceptable during a past NRC license review (NRC reviewer should confirm). The ability of the facility to withstand seismic damage was also reviewed and found acceptable (NRC reviewer should confirm). As part of the focused review, seismic damage does not need a detailed review except if it is discussed by the licensee in the external event section of Chapter

13. In that case, the reviewer should confirm that the discussion here is consistent with that in Chapter 13 and follow Chapter 13 review guidance.

3.5 Systems and Components

This section of the SAR describes the general design bases for the systems and components required to function for safe reactor operation and shutdown. Specific design bases, as applicable, will be reviewed as part of the review of SAR sections subject to the focused review process, therefore, the general design criteria do not need to be reviewed.

4. REACTOR DESCRIPTION

The reactor is an area of full review in the focused review process. This chapter of the SAR describes the principal features, operating characteristics, and parameters of the reactor. Some reactors subject to license renewal (University of Wisconsin, Washington State University, University of Florida and Texas A&M University TRIGA) have undergone a HEU to LEU conversion that was reviewed using the SRP. The reviewer may use the SER from the conversion as a starting point for the Chapter 4 review. The reviewer should determine that the conversion SER continues to accurately reflect the reactor. In all cases, the conversion application was submitted after the renewal application. The discussion in the conversion SAR supersedes the matching discussion in the renewal SAR. The conversion SARs are narrowly focused on the issue of fuel conversion. The reviewer should ensure that sections of Chapter 4 outside the scope of the conversion are reviewed using the guidance of the SRP and this focused review plan. The applicable TSs for sections of Chapter 4 should be reviewed and the reviewer should discuss why the TSs including their bases are acceptable.

4.1 Summary Description

The reviewer should follow the guidance of the SRP.

4.2 Reactor Core

The reviewer should follow the guidance of the SRP. This is a review area that has a potential for no change. If no change has occurred in the area of reactor core since the last license renewal review, or initial licensing if this is the first license renewal, the reviewer may choose to restate the past evaluation in this area. If the reviewer decides to rely on a past evaluation, as part of the review, the reviewer should assure that any TSs (see ANS-15.1 – Section 1.3 and 3.1 (4)) and their bases have not changed, are consistent with the guidance of ANS-15.1 and the SRP, and were fully evaluated and approved in the past review. For those facilities listed above that have undergone HEU to LEU conversion, the reviewer should use the conversion SAR and SER to assist in the review of this section.

4.2.1 Reactor Fuel

The reviewer should follow the guidance of the SRP. This is a review area that has a potential for no change. If no change has occurred in the area of reactor fuel since the last license renewal review, or initial licensing if this is the first license renewal, the reviewer may choose to restate the past evaluation in this area. If the reviewer decides to rely on a past evaluation, as part of the review, the reviewer should assure that any TSs (see ANS-15.1 – Section 3.1 (6), 4.1

(3), and 5.3) and their bases have not changed, are consistent with the guidance of ANS-15.1 and the SRP, and were fully evaluated and approved in the past review. For those facilities listed above that have undergone HEU to LEU conversion, the reviewer should use the conversion SAR and SER to assist in the review of this section. The reviewer should consider the prior utilization of the reactor fuel to verify that aging of the fuel will not be an issue during the renewal period.

4.2.2 Control Rods

The reviewer should follow the guidance of the SRP. This is a review area that has a potential for no change. If no change has occurred in the area of control rods since the last license renewal review, or initial licensing if this is the first license renewal, the reviewer may choose to restate the past evaluation in this area. If the reviewer decides to rely on a past evaluation, as part of the review, the reviewer should assure that any TSs (see ANS-15.1 – Section 3.2 (1), (2) and (3) and 4.2 (1), (2), (3), and (4)) and their bases have not changed, are consistent with the guidance of ANS-15.1 and the SRP, and were fully evaluated and approved in the past review. For those facilities listed above that have undergone HEU to LEU conversion, the reviewer should use the conversion SAR and SER to assist in the review of this section. The reviewer should consider the prior utilization of the control rods to verify that aging of the control rods will not be an issue during the renewal period.

4.2.3 Neutron Moderator and Reflector

The reviewer should follow the guidance of the SRP. This is a review area that has a potential for no change. If no change has occurred in the area of neutron moderator and reflector since the last license renewal review, or initial licensing if this is the first license renewal, the reviewer may choose to restate the past evaluation in this area. If the reviewer decides to rely on a past evaluation, as part of the review, the reviewer should assure that any TSs and their bases have not changed, are consistent with the guidance of ANS-15.1 and the SRP, and were fully evaluated and approved in the past review. For those facilities listed above that have undergone HEU to LEU conversion, the reviewer should use the conversion SAR and SER to assist in the review of this section.

4.2.4 Neutron Startup Source

The reviewer should follow the guidance of the SRP. This is a review area that has a potential for no change. If no change has occurred in the area of neutron startup source since the last license renewal review, or initial licensing if this is the first license renewal, the reviewer may choose to restate the past evaluation in this area. If the reviewer decides to rely on a past evaluation, as part of the review, the reviewer should assure that any TSs and their bases have not changed, are consistent with the guidance of ANS-15.1 and the SRP, and were fully evaluated and approved in the past review. HEU to LEU conversion does not normally impact this section of the SAR and the conversion SER normally does not address this topic.

4.2.5 Core Support Structure

The reviewer should follow the guidance of the SRP. This is a review area that has a potential for no change. If no change has occurred in the area of core support structure since the last license renewal review, or initial licensing if this is the first license renewal, the reviewer may

choose to restate the past evaluation in this area. If the reviewer decides to rely on a past evaluation, as part of the review, the reviewer should assure that any TSs and their bases have not changed, are consistent with the guidance of ANS-15.1 and the SRP, and were fully evaluated and approved in the past review. HEU to LEU conversion does not normally impact this section of the SAR and the conversion SER normally does not address this topic.

4.3 Reactor Tank or Pool

The reviewer should follow the guidance of the SRP. This is a review area that has a potential for no change except for tank or pool leakage as discussed below. If no change has occurred in the area of reactor tank or pool since the last license renewal review, or initial licensing if this is the first license renewal, the reviewer may choose to restate the past evaluation in this area. If the reviewer decides to rely on a past evaluation, as part of the review, the reviewer should assure that any TSs and their bases have not changed, are consistent with the guidance of ANS-15.1 and the SRP, and were fully evaluated and approved in the past review. HEU to LEU conversion does not normally impact this section of the SAR and the conversion SER normally does not address this topic.

As research reactors have aged, several have developed tank and pool leaks. The NRC staff focuses on this issue during license renewal to assure that tank or pool leakage is an evaluated event. The fifth bullet under this section of the NUREG-1537 standard format and content guidance discusses this issue. However, it is not unusual for licensees not to address this issue. The licensee should discuss how they would detect leakage of primary coolant from the tank or pool and the minimum level of leakage that can be detected. The radiological impact on the environment and public from a potential tank or pool leak should be discussed. The impact should be within the limits of 10 CFR Part 20.

4.4 Biological Shield

The reviewer should follow the guidance of the SRP. This is a review area that has a potential for no change. If no change has occurred in the area of biological shield since the last license renewal review, or initial licensing if this is the first license renewal, the reviewer may choose to restate the past evaluation in this area. If the reviewer decides to rely on a past evaluation, as part of the review, the reviewer should assure that any TSs and their bases have not changed, are consistent with the guidance of ANS-15.1 and the SRP, and were fully evaluated and approved in the past review. HEU to LEU conversion does not normally impact this section of the SAR and the conversion SER normally does not address this topic.

4.5 Nuclear Design

In this section of the SAR, the applicant should show how the systems described in this chapter function together to form a nuclear reactor that can be operated and shut down safely from any operating condition. Much of the information in this section of the SAR is derived from calculations performed by neutronic codes. The NRC staff may choose to model the reactor using current codes as part of NRC's independent review of the licensee's renewal application. The results of nuclear design calculations also can serve as input to thermal-hydraulic calculations. Staff evaluations performed for HEU-LEU conversion can provide substantial input

to this section of the SER. For those facilities listed above that have undergone HEU to LEU conversion, the reviewer should use the conversion SAR and SER to assist in the review of this section.

4.5.1 Normal Operating Conditions

The reviewer should follow the guidance of the SRP. For possible TSSs, see ANS-15.1 – Section 1.3, 3.1 (1), (2), (3) and (5), and 4.1 (1) and (2).

4.5.2 Reactor Core Physics Parameters

The reviewer should follow the guidance of the SRP.

4.5.3 Operating Limits

The reviewer should follow the guidance of the SRP. For possible TSSs, see ANS-15.1 – Section 2.

When reviewing the limiting safety system setting (LSSS) for TRIGA reactors based on the temperature measured in an instrumented fuel element, the reviewer should confirm that the value of the LSSS protects the hot coolant channel in the core from burn out and protects the safety limit in the hot channel for all allowed core locations of the instrumented fuel element. The staff has reviewed cases where the instrumented fuel element was located in a low power area near the edge of the core away from the hot coolant channel. During code calculations runs, when the instrumented fuel element reached the LSSS, the heat produced in the hot channel caused the channel to burn out allowing the safety limit to be exceeded in the hot channel. To demonstrate acceptable performance of the LSSS for the instrumented fuel element may require neutronic and thermal-hydraulic codes to be run.

4.6 Thermal-Hydraulic Design

The information in this section of the SAR should enable the reviewer to determine the limits on heat removal necessary to ensure that fuel integrity will not be lost under any reactor conditions (including pulsing, if applicable) including accidents. The reactors subject to this focused review plan have natural convection cooling or are Aerojet General Nucleonics (AGN)-type reactors without engineered coolant systems.

The reviewer should follow the guidance in the SRP.

Much of the information in this section of the SAR should be derived from calculations performed by thermal-hydraulic codes. The neutronic calculations discussed in Section 4.5 above, are used as inputs into the thermal-hydraulic codes. The NRC staff may choose to model the reactor using current codes as part of NRC's independent review of the licensee's renewal application.

The decision to perform an independent review based on code runs is dependent on the detail and depth of the thermal-hydraulic discussion in the SAR. For those facilities that were subject to HEU to LEU conversion which was reviewed using NUREG-1537, the NRC staff has

reviewed and accepted the licensee's code models and calculations. The staff evaluations performed for HEU-LEU conversion can provide substantial input to this section of the SER.

These facilities do not need independent code runs performed by the NRC staff. For those facilities listed above that have undergone HEU to LEU conversion, the reviewer should use the conversion SAR and SER to assist in the review of this section.

For those SARs where the discussion is based on a review of a generic reactor that differs in such areas as core layout, fuel density, flux profile, fuel enrichment and burnup, or for those where the departure from nucleate boiling ratio during operation and accidents is not clearly given and justified, the NRC staff would be well served by performing independent code runs to verify reactor performance and margins of safety.

5. REACTOR COOLANT SYSTEMS

This chapter of the SAR discusses the design bases, descriptions, and functional analyses of the reactor coolant systems. With the exception of AGN designed reactors, the reactors that are subject to this focused review plan are cooled by natural convection. The thermal-hydraulic analysis discussed in Section 4.6 above, should show that the reactor can be sufficiently cooled and that acceptable safety margins exist. AGN designed reactors do not have engineered coolant systems. In accordance with the standard format and content and SRP, disposition of heat produced by AGN designed reactors is not discussed in this chapter but is discussed in Chapter 4. The NRC reviewer should follow Chapter 4 of the SRP for AGN reactors.

As part of the focused review, most aspects of this chapter of the SAR do not receive detailed reviews. These systems do not normally undergo significant change after initial licensing. These systems were reviewed and found acceptable by NRC during initial licensing or for those facilities that were subject to renewal, during the last renewal (NRC reviewer should confirm this). Any safety significant changes since the last renewal or initial licensing should have been made by NRC-approved license amendments.

The detailed staff review of this chapter should be limited to TSs. Applicable TSs are in the areas of limiting conditions for operation (see ANS-15.1 – Section 3.3), surveillance requirements (see ANS-15.1 – Section 4.3) and design features (see ANS-15.1 – Section 5.2). Given the reactor designs subject to this focused review, ANS-15.1 – Section 3.3 (1), (6), and (7), and Section 4.3 (1), (2), and (5) may be out of scope and the reviewer should not expect to see TSs in these areas. Safety significant aspects of the reactor coolant systems are controlled by the TSs. Review of TSs including their bases against the SRP and arriving at a conclusion that the TSs and bases are acceptable should allow the NRC reviewer to conclude that the reactor coolant systems will perform their functions acceptably with reasonable assurance. While failure of reactor coolant system components can be initiating events for accident scenarios, for the reactors that are subject to this focused review, loss of coolant and loss of coolant flow are the most likely initiating events (auxiliary uses of primary coolant could also be initiating scenarios for accidents). These events are reviewed as part of Chapter 13.

5.1 Summary Description

As part of a focused renewal review, the NRC reviewer does not need to perform a detailed review of this section of the SAR.

5.2 Primary Coolant System

As part of the focused renewal review process, the detailed review of this section of the SAR is limited to review of applicable TSs. The most likely TSs would consist of limiting conditions for operation (see ANS-15.1 – Section 3.3 (2), (3), (4), (5), and (9)), surveillance requirements (see ANS-15.1 – Section 4.3 (3), (4) and (6)), and design feature TSs (see ANS-15.1 – Section 5.2). The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

5.3 Secondary Coolant Systems

As part of the focused renewal review process, the detailed review of this section of the SAR is limited to review of applicable TSs. The most likely TSs would consist of limiting conditions for operation (see ANS-15.1 – Section 3.3 (4) and (8)), surveillance requirements (see ANS-15.1 – Section 4.3 (3)), and design feature TSs (see ANS-15.1 – Section 5.2), although it is not unusual to have no TSs related to the secondary coolant system. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-5.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

5.4 Primary Coolant Cleanup System

As part of the focused renewal review process, the detailed review of this section of the SAR is limited to review of applicable TSs. The most likely TSs would consist of limiting conditions for operation (see ANS-15.1 – Section 3.3 (9)), surveillance requirements (see ANS-15.1 – Section 4.3 (3) and (6)), and design feature TSs (see ANS-15.1 – Section 5.2). The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

5.5 Primary Coolant Makeup Water System

As part of the focused renewal review process, the detailed review of this section of the SAR is limited to review of applicable TSs. The most likely TSs would consist of limiting conditions for operation (see ANS-15.1 – Section 3.3 (9)), surveillance requirements (ANS-15.1 – Section 4.3 (3) and (6)), and design feature TSs (ANS-15.1 – Section 5.2). However, the primary coolant makeup water system normally does not have associated TSs. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

5.6 Nitrogen-16 Control System

As part of the focused renewal review process, the detailed review of this section of the SAR is limited to review of applicable TSs. The most likely TSs would consist of design feature TSs (see ANS-15.1 – Section 5.2). However, the nitrogen-16 control system normally does not have associated TSs. The reviewer should confirm that the proposed TSs are consistent with the

guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

5.7 Auxiliary Systems Using Primary Coolant

Auxiliary systems using primary coolant vary widely depending on facility design. The failure of auxiliary systems could be accident scenario initiators. If this is the case, the impacted systems should be identified in Chapter 13. Some possible systems that use primary coolant are:

- experiment cooling
- experimental facility cooling
- experimental facility shielding
- biological shield cooling
- thermal shield cooling and
- fuel storage cooling or shielding.

As part of the focused renewal process, detailed review of this section of the SAR is normally limited to review of applicable TSs. The TSs could consist of limiting conditions of operation, surveillance requirements and/or design features. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

6. ENGINEERED SAFETY FEATURES

This chapter of the SAR discusses active or passive engineered safety features (ESFs) of the reactor facility that are designed to mitigate the consequences of accidents. Because ESFs mitigate the consequences of accidents, they are directly related to accident analysis in Chapter 13, one of the areas of full review in the focused review process.

The staff detailed review of this chapter should be limited to that needed to support the accident analysis in Chapter 13 and TSs. If the licensee discusses a system in the accident analysis section of the SAR that is not mitigating accident consequences, then that system is not an ESF and is outside of the scope of the accident review. For the reactors subject to this focused review plan, the primary ESFs discussed in the SAR, if any, will be the confinement and associated ventilation system.

There is a discussion in this section of the SRP and Standard Format and Content guidance of acceptable doses during accident scenarios. An update of that discussion can be found in Chapter 13 below.

6.1 Summary Description

As part of the focused renewal process, the NRC reviewer does not need to perform a detailed review this section of the SAR.

6.2 Detailed Descriptions

This section of the SAR discusses in detail the particular ESFs incorporated into the reactor design.

6.2.1 Confinement

If the licensee uses the confinement and associated ventilation system as an ESF, the reviewer should follow the SRP to review the confinement, associated ventilation system and related TSs.

If the reviewer determines that the confinement and associated ventilation system is not an ESF, then detailed review of this section of the SAR is limited to review of applicable TSs. Non-ESF functions of the confinement and associated ventilation system are normally discussed in Chapter 9, "Auxiliary Systems," of the SAR and are discussed below.

In both cases, the most likely TSs would consist of limiting conditions for operation (see ANS-15.1 – Section 3.4 and 3.5 (2)) and surveillance requirements (see ANS-15.1 – Section 4.4.2 and 4.5 (1)). The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

6.2.2 Containment

None of the facilities subject to this focused review plan have a containment. As part of the review of the accident analysis, the reviewer should confirm that a containment ESF is not needed to mitigate the consequences of accident scenarios to acceptable levels.

6.2.3 Emergency Core Cooling System

None of the facilities subject to this focused review plan have an emergency core cooling system. As part of the review of the loss of coolant accident, the reviewer should confirm that an emergency core cooling system ESF is not needed to mitigate the consequences of accident scenarios to acceptable levels.

7. INSTRUMENTATION AND CONTROL SYSTEMS

Most aspects of this chapter of the SAR are not reviewed in detail as part of the focused renewal review process. These systems were reviewed and found acceptable by NRC during initial licensing or for those facilities that were subject to renewal, during the last renewal (NRC reviewer should confirm this). Most changes to instrumentation and control (I&C) systems because of obsolescence were like-function replacements with modern components (i.e., vacuum tubes being replaced with solid state components) evaluated by the licensee under the requirements of 10 CFR 50.59 and found not to need prior NRC review. Significant changes like the introduction of digital technology into the safety function of I&C systems were reviewed by NRC and approved by license amendment.

The detailed staff review for most parts of this chapter should be limited to TSs. I&C systems associated with ESFs may need additional review as described below. Applicable TSs are in the areas of limiting conditions for operation (see ANS-15.1 – Section 3.2) and surveillance requirements (see ANS-15.1 – Section 4.2). Safety significant aspects of the I&C systems are

controlled by the TSs. Review of TSs, including their bases, against the SRP and arriving at a conclusion that the TSs and bases are acceptable should allow the NRC reviewer to conclude that there is reasonable assurance that the I&C systems will perform their functions acceptably.

While failure of I&C system components can be initiating accident events, these events, if they exist, are reviewed as part of Chapter 13.

7.1 Summary Description

As part of the focused renewal review process, the NRC reviewer does not need to perform a detailed review of this section of the SAR.

7.2 Design of Instrumentation and Control Systems

As part of the focused renewal review process, the NRC reviewer does not need to perform a detailed review of this section of the SAR.

7.3 Reactor Control System

As part of the focused renewal review process, detailed review of this section of the SAR is limited to review of applicable TSs. The most likely TSs would consist of limiting conditions for operation (see ANS-15.1 – Section 3.2 (2), (3), (5), (6) and (8), Note – Section 3.2 (2) and (3) may be discussed as part of Chapter 4) and surveillance requirements (see ANS-15.1 – Section 4.2 (1), (2), (3), (6), (8) and (9), Note – Section 4.2 (1), (2), (3), and (4) may be discussed as part of Chapter 4). The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

7.4 Reactor Protection System

As part of the focused renewal review process, detailed review of this section of the SAR is limited to review of applicable TSs. The most likely TSs would consist of limiting conditions for operation (see ANS-15.1 – Section 3.2 (1), (4), (5), (7), and (8), Note – Sections 3.2 (1) and (4) may be discussed as part of Chapter 4) and surveillance requirements (see ANS-15.1 – Section 4.2 (4), (5), (6) and (9), Note – Section 4.2 (4) may be discussed as part of Chapter 4). The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

7.5 Engineered Safety Features Actuation System

The reviewer should refer to the discussion for Chapter 6 above. If it has been determined that ESFs are needed to mitigate the consequences of accidents, then the reviewer should follow this section of the SRP to evaluate the I&C systems of the ESFs.

7.6 Control Console and Display Instruments

As part of the focused renewal review process, detailed review of this section of the SAR is limited to review of applicable TSs. It is unusual to have TSs in this review area. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

7.7 Radiation Monitoring Systems

As part of the focused renewal review process, detailed review of this section of the SAR is limited to review of applicable TSs. However, TSs concerning the radiation monitoring systems are usually reviewed as part Chapter 11. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

8. ELECTRICAL POWER SYSTEMS

This chapter of the SAR discusses and describes the electrical power systems at RTR facilities designed to support reactor operations. Most aspects of this chapter of the SAR are not reviewed in detail as part of the focused renewal review process. Detailed review of this chapter of the SAR is limited to that needed to support the evaluation of the Chapter 13 loss of normal power accident and TSs. These systems were reviewed and found acceptable by NRC during initial licensing or for those facilities that were subject to renewal, during the last renewal (NRC reviewer should confirm this). Safety significant aspects of electrical power systems are controlled by the TSs. Review of TSs, including their bases, against the SRP and arriving at a conclusion that the TSs and bases are acceptable should allow the NRC reviewer to conclude that there is reasonable assurance that the electrical power systems will perform their functions acceptably. The loss of normal electrical power is an initiating event evaluated as part of the accident analysis discussed in Chapter 13.

8.1 Normal Electrical Power Systems

As part of the focused renewal review process, detailed review of this section of the SAR is limited to review of applicable TSs and any aspects of normal electrical power systems that need to be reviewed as part of the review of Chapter 13. Note that TSs in the area of normal electrical power systems are not common. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

8.2 Emergency Electrical Power Systems

As part of the focused renewal review process, detailed review of this section of the SAR is limited to review of applicable TSs and any aspects of emergency electrical power systems that need to be reviewed as part of the review of Chapter 13. For example, there may be ESFs that operate on emergency power. The most likely TSs would consist of limiting conditions for operation (see ANS-15.1 – Section 3.6) and surveillance requirements (see ANS-15.1 – Section

4.6). The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

9. AUXILIARY SYSTEMS

This chapter of the SAR discusses the auxiliary systems at the reactor facility. Common auxiliary systems are heating, ventilation and air conditioning (HVAC) systems, fuel handling and storage systems, fire protection systems and programs, communications systems, primary coolant system cover gas control, other facility specific auxiliary systems and the possession and use of byproduct, source and special nuclear material. Most aspects of this chapter of the SAR are not reviewed in detail as part of the focused renewal review process. Detailed review of this chapter of the SAR is limited to that needed to support the evaluation of the Chapter 13 accidents and TSs. These systems were reviewed and found acceptable by NRC during initial licensing or for those facilities that were subject to renewal, during the last renewal (NRC reviewer should confirm this). Safety significant aspects of auxiliary systems are controlled by the TSs. Review of TSs, including their bases, against the SRP and arriving at a conclusion that the TSs and bases are acceptable should allow the NRC reviewer to conclude that there is reasonable assurance that the auxiliary systems will perform their functions acceptably.

9.1 Heating, Ventilation, and Air Conditioning Systems

As part of the focused renewal review process, detailed review of this section of the SAR is limited to review of applicable TSs. As discussed in Chapter 6 above, some aspects of the HVAC system may perform ESF functions. However, ESF function is not part of the review of this section. The auxiliary system HVAC functions are limited to the normal operation of the HVAC system. The most likely TSs would consist of limiting conditions for operation (see ANS-15.1 – Section 3.5 (1)) and surveillance requirements (see ANS-15.1 – Section 4.5 (2)). The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

9.2 Handling and Storage of Reactor Fuel

As part of the focused renewal review process, detailed review of this section of the SAR is limited to review of applicable TSs and accident analysis. The most likely TSs would consist of design features (see ANS-15.1 – Section 5.4). The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable. Mishandling or fuel is an accident initiator discussed in Chapter 13. The reviewer should confirm that the licensee has properly considered information in this section in the accident analysis in Chapter 13.

9.3 Fire Protection Systems and Programs

As part of the focused renewal review process, detailed review of this section of the SAR is limited to review of applicable TSs. However, it is not common to have TSs in this review area. If the licensee has proposed TSs, the reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and

technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

9.4 Communication Systems

As part of the focused renewal review process, detailed review of this section of the SAR is limited to review of applicable TSs. However, it is not common to have TSs in this review area. If the licensee has proposed TSs, the reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

9.5 Possession and Use of Byproduct, Source, and Special Nuclear Material

As part of the focused renewal review process, detailed review of this section of the SAR is limited to review of applicable TSs and license possession limits for special nuclear, byproduct, and if requested by the licensee, source material.

However, it is not common to have TSs in this review area. If the licensee has proposed TSs, the reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

The reviewer should follow the SRP to confirm that the requested license possession limits are supported by the renewal application and are acceptable.

9.6 Cover Gas Control in Closed Primary Coolant Systems

None of the facilities subject to this supplemental guidance have primary coolant system cover gas control. Therefore, this section is out of the scope of the renewal review.

9.7 Other Auxiliary Systems

The SAR may identify Auxiliary Systems in addition to those discussed in the SRP. For example, some facility SARs discuss compressed air systems. If these other auxiliary systems play a role in the accident analysis in Chapter 13, then the reviewer should follow the SRP. This situation will be uncommon.

It is uncommon to have TSs in this review area. However, if the licensee has proposed TSs, the reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

10. EXPERIMENTAL FACILITIES AND UTILIZATION

This chapter of the SAR discusses the experimental facilities at the RTR facility, their intended use, and the experimental program. Experiment malfunction is an accident initiating event considered in Chapter 13. This consideration is usually generic in nature and may be based on experimental TS limits (e.g., Rapid addition of positive reactivity into the reactor. While the

reactivity addition may come from the failure of an experiment, the evaluation of the accident falls into the category of reactivity addition accidents.) or experiment or experimental facility failure (e.g., Failure of a beam tube may be an initiating event for a loss of coolant accident.).

Malfunctions of individual experiments are normally reviewed by the licensee as part of the experiment development and review process using the regulations in 10 CFR 50.59. Experiments that cannot be successfully approved using the process in 10 CFR 50.59 would need NRC approval in the form of a license amendment prior to initiation.

For some low powered research reactors, the failure of a fueled experiment with its subsequent release of fission products to the environment is the maximum hypothetical accident (MHA). As part of the MHA review in Chapter 13, the reviewer may need to review and refer to aspects of experimental facilities and their governing TSs discussed in this Chapter.

Some SARs may contain a section on experiment TS limits. The SRP does not have a specific section on experimental limits. Experiment TS limits is discussed as part of sections 10.2 and 10.3 below.

10.1 Summary Description

As part of the focused renewal review process, the NRC reviewer does not need to perform a detailed review of this section of the SAR.

10.2 Experimental Facilities

The detailed staff review for most parts of this section should be limited to TSs and information on accident initiating events. Applicable TSs are in the areas of limiting conditions for operation (see ANS-15.1 – Section 3.8) and surveillance requirements (see ANS-15.1 – Section 4.8). Safety significant aspects of experimental facilities and associated experiments are controlled by the TSs. Review of TSs, including their bases, against the SRP and arriving at a conclusion that the TSs and bases are acceptable should allow the NRC reviewer to conclude that there is reasonable assurance that experimental facilities and associated experiments will perform their functions acceptably. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable. While failure of experimental facilities and associated experiments can be initiating accident events, these events are reviewed as part of Chapter 13.

10.3 Experiment Review

This section of the SAR discusses the administrative procedures used by the licensee to review and approve experiments. The detailed staff review for most parts of this chapter should be limited to TSs. Applicable TSs are in the areas of surveillance requirements (see ANS-15.1 – Section 4.8) and administrative controls (see ANS-15.1 – Parts of Section 6.2 and Section 6.5). Safety significant aspects of experimental facilities and associated experiments are controlled by the TSs. Review of TSs, including their bases, against the SRP (where applicable, Section 6 TSs do not normally have bases) and arriving at a conclusion that the TSs and bases (where applicable) are acceptable should allow the NRC reviewer to conclude that there is reasonable

assurance that experimental facilities and associated experiments will perform their functions acceptably. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases (where applicable) are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

11. RADIATION PROTECTION PROGRAM AND WASTE MANAGEMENT

This chapter of the SAR discusses and analyzes all radiological consequences related to normal operation of the reactor. The reviewer shall review the licensee's methodology to determine dose from normal airborne effluents. The calculation methodologies used to determine doses to members of the reactor staff and the public from accident conditions may be discussed in this chapter of the SAR. If that is the case, the reviewer may need to review the calculation methodologies as part of the review of accidents in Chapter 13 of the SAR. Another potential review area is TSs.

The NRC inspection program reviews the licensee's radiation and environmental protection programs. The reviewer should confirm that the last five inspections of the radiation and environmental protection programs concluded that the programs met the requirements of the regulations and were acceptable. If the inspection program identified Severity Level IV violations or significant open issues, the NRC reviewer should confirm that the corrective actions or steps taken by the licensee to address issues were acceptable to NRC. If there have been violations at Severity Level I, II, or III and violations at Severity Level IV that were not properly corrected by the licensee as indicated by continuing issues, the reviewer should give consideration to conducting a review in the affected area following the SRP. If the reviewer relies on inspection reports as support for findings, then the SER must include a discussion of the inspection reports.

The licensees subject to this focused review plan underwent initial licensing or their last license renewal prior to significant changes that occurred to 10 CFR Part 20 in 1994. The changes as they relate to review of the SAR are discussed in Chapter 13 below. The reviewer should confirm that all doses are in compliance with 10 CFR Part 20.

11.1 Radiation Protection

This section of the SAR discusses radiation protection at the RTR facility.

11.1.1 Radiation Sources

The detailed staff review for most parts of this section should be limited to TSs. Applicable TSs are in the areas of limiting conditions of operation (see ANS-15.1 – Section 3.7.2) and surveillance requirements (see ANS-15.1 – Section 4.7.2). Safety significant aspects of radiation sources are controlled by the TSs and the radiation protection program. The reviewer should review the licensee's methodology for calculating doses to their staff and members of the public. Review of TSs, including their bases, against the SRP and arriving at a conclusion that the TSs and bases are acceptable and a finding that the radiation protection program is acceptable should allow the NRC reviewer to conclude with reasonable assurance that radiation sources are being acceptably controlled. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and

technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable.

11.1.2 Radiation Protection Program

The detailed staff review for this section is normally limited to a review of applicable TSs. Applicable TSs are in the area of administrative controls (see ANS-15.1 – Section 6.1, 6.2 and 6.3). The NRC inspection program reviews the licensee's radiation protection program. The reviewer should review facility inspection reports following the guidance above.

Safety significant aspects of the radiation protection program are controlled by the TSs. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable. Review of TSs, including their bases, against the SRP leading to a conclusion that the TSs and basis are acceptable along with acceptable results from the NRC inspection program should allow the NRC reviewer to conclude with reasonable assurance that the radiation protection program functions acceptably.

11.1.3 ALARA Program

The detailed staff review for this section is normally limited to a review of applicable TSs, usually the same TSs that are applicable to the radiation protection program. Applicable TSs are in the area of administrative controls (see ANS-15.1 – Section 6.1, 6.2 and 6.3). The NRC inspection program reviews the licensee's ALARA program. The reviewer should review facility inspection reports following the guidance above.

Safety significant aspects of the ALARA program are controlled by the TSs. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable. Review of TSs, including their bases, against the SRP leading to a conclusion that the TSs and basis are acceptable along with acceptable results from the NRC inspection program should allow the NRC reviewer to conclude with reasonable assurance that the ALARA program functions acceptably.

11.1.4 Radiation Monitoring and Surveying

The detailed staff review for this section is normally limited to a review of applicable TSs. However, the radiation monitoring system may detect accident conditions and initiate actions by ESFs. If that is the case, the applicable parts of the radiation monitoring system should be reviewed using the SRP. Applicable TSs are in the areas of limiting conditions for operation (see ANS-15.1 – Section 3.7.1) and surveillance requirements (see ANS-15.1 – Section 4.7.1). The NRC inspection program reviews radiation monitoring and surveys. The reviewer should review facility inspection reports following the guidance above.

Safety significant aspects of the radiation monitoring and surveying are controlled by the TSs. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable. Review of TSs, including their bases, against the SRP leading to a conclusion that the TSs and basis are acceptable along

with acceptable results from the NRC inspection program should allow the NRC reviewer to conclude with reasonable assurance that radiation monitoring and surveying are being carried out acceptably.

11.1.5 Radiation Exposure Control and Dosimetry

As part of the focused review plan, detailed review of this section of the SAR is limited to review of applicable TSs. However, it is not common to have TSs in this review area. The NRC inspection program reviews radiation exposure control and dosimetry. The reviewer should review facility inspection reports following the guidance above.

If the licensee has proposed TSs, the reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable. Review of TSs, including their bases, against the SRP leading to a conclusion that the TSs and basis are acceptable and/or acceptable results from the NRC inspection program should allow the NRC reviewer to conclude with reasonable assurance that the licensee's radiation exposure control and dosimetry programs are acceptable.

11.1.6 Contamination Control

As part of the focused review plan, detailed review of this section of the SAR is limited to review of applicable TSs. However, it is not common to have TSs in this review area. The NRC inspection program reviews contamination control. The reviewer should review facility inspection reports following the guidance above.

If the licensee has proposed TSs, the reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable. Review of TSs, including their bases, against the SRP leading to a conclusion that the TSs and basis are acceptable and/or acceptable results from the NRC inspection program should allow the NRC reviewer to conclude with reasonable assurance that the licensee's contamination control program is acceptable.

11.1.7 Environmental Monitoring

As part of the focused review plan, detailed review of this section of the SAR is limited to review of applicable TSs. However, it is not common to have TSs in this review area. The NRC inspection program reviews environmental protection. The reviewer should review facility inspection reports following the guidance above.

If the licensee has proposed TSs, the reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable. Review of TSs, including their bases, against the SRP leading to a conclusion that the TSs and basis are acceptable and/or acceptable results from the NRC inspection program should allow the NRC reviewer to conclude with reasonable assurance that the licensee's environmental monitoring program is acceptable.

11.2 Radioactive Waste Management

This section of the SAR discusses the program and procedures that are designed to ensure that radioactive waste materials are identified, assessed, controlled, and disposed of in conformance with all applicable regulations and in a manner to protect the health and safety of the public and the environment. Acceptable radioactive waste management is normally shown by compliance against the regulations in Part 20 rather than by compliance with TSs. The review of the NRC inspection program results is used to show the licensee is meeting the regulations.

11.2.1 Radioactive Waste Management Program

As part of the focused review plan, detailed review of this section of the SAR is limited to review of applicable TSs. However, it is not common to have TSs in this review area. The NRC inspection program reviews the radioactive waste management program by inspection of radiation and environmental protection. The reviewer should review facility inspection reports following the guidance above.

If the licensee has proposed TSs, the reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable. Review of TSs, including their bases, against the SRP leading to a conclusion that the TSs and basis are acceptable and/or acceptable results from the NRC inspection program should allow the NRC reviewer to conclude with reasonable assurance that the licensee's radioactive waste management program is acceptable.

11.2.2 Radioactive Waste Controls

Some aspects of radioactive waste controls such as control of airborne waste are integral to the facility ventilation system and may be reviewed as part of the review of that area. As part of the focused review plan, detailed review of this section of the SAR is limited to review of applicable TSs. However, it is not common to have TSs in this review area. The NRC inspection program reviews the radioactive waste controls by inspection of radiation and environmental protection. The reviewer should review facility inspection reports following the guidance above.

If the licensee has proposed TSs, the reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable. Review of TSs, including their bases, against the SRP leading to a conclusion that the TSs and basis are acceptable and/or acceptable results from the NRC inspection program should allow the NRC reviewer to conclude with reasonable assurance that the licensee's radioactive waste controls are acceptable.

11.2.3 Release of Radioactive Waste

Most aspects of release of radioactive waste such as effluents are reviewed as part of Section 11.1.1 above. As part of the focused review plan, detailed review of this section of the SAR is limited to review of applicable TSs. However, it is not common to have TSs in this review area. The NRC inspection program reviews the release of radioactive waste by inspection of radiation and environmental protection. The reviewer should review facility inspection reports following the guidance above.

If the licensee has proposed TSs, the reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 and that the bases are complete and technically sound. The guidance in the SRP can be used to determine if the TS basis is acceptable. Review of TSs, including their bases, against the SRP leading to a conclusion that the TSs and basis are acceptable and/or acceptable results from the NRC inspection program should allow the NRC reviewer to conclude with reasonable assurance that the licensee's release of radioactive waste is acceptable.

12. CONDUCT OF OPERATIONS

This chapter of the SAR discusses the conduct of operations at the reactor facility. The conduct of operations involves the administrative aspects of facility operation such as the facility organization, review and audit activities, organizational aspects of radiation safety, facility procedures, required actions in case of license or technical specification violations, reporting requirements, and recordkeeping. This chapter of the SAR forms the basis of Section 6 of the TSs, "Administrative Controls." Section 6 of the TSs usually does not have bases. If the licensee has proposed bases, they should be reviewed using the applicable section of the SRP.

12.1 Organization

The detailed staff review for this section should be limited to TSs. Applicable TSs are in the area of administrative controls (see ANS-15.1 – Section 6.1). Safety significant aspects of the organization are controlled by the TSs. Arriving at a conclusion that the TSs are acceptable should allow the NRC reviewer to conclude with reasonable assurance that the organization is acceptable. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1.

12.1.1 Structure

The detailed staff review for this section should be limited to TSs. Applicable TSs are in the area of administrative controls (see ANS-15.1 – Section 6.1.1). Safety significant aspects of the organizational structure are controlled by the TSs. Arriving at a conclusion that the TSs are acceptable should allow the NRC reviewer to conclude with reasonable assurance that the organizational structure is acceptable. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1.

12.1.2 Responsibility

The detailed staff review for this section should be limited to TSs. Applicable TSs are in the area of administrative controls (see ANS-15.1 – Section 6.1.2). Safety significant aspects of the organizational responsibility are controlled by the TSs. Arriving at a conclusion that the TSs are acceptable should allow the NRC reviewer to conclude with reasonable assurance that

organizational responsibility is acceptable. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1.

12.1.3 Staffing

The detailed staff review for this section should be limited to TSs and ensuring that staffing for reactor operations meets the requirements of the regulations in 10 CFR 50.54 (i) to (m)(1). Applicable TSs are in the area of administrative controls (see ANS-15.1 – Section 6.1.3). Safety significant aspects of staffing are controlled by the TSs. Arriving at a conclusion that the TSs are acceptable and the regulations in 10 CFR 50.54 (i) to (m)(1) are met should allow the NRC reviewer to conclude with reasonable assurance that organizational staffing is acceptable. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1.

12.1.4 Selection and Training of Personnel

The detailed staff review for this section should be limited to TSs. Applicable TSs are in the area of administrative controls (see ANS-15.1 – Section 6.1.4). Safety significant aspects of the selection and training of personnel are controlled by the TSs. Arriving at a conclusion that the TSs are acceptable should allow the NRC reviewer to conclude with reasonable assurance that the selection and training of personnel is acceptable. This finding does not include the requalification program which is discussed below. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1.

12.1.5 Radiation Safety

The detailed staff review for this section should be limited to TSs. The administrative aspects of the radiation safety program are also discussed in Chapter 11 above. Applicable TSs are in the area of administrative controls (see ANS-15.1 – Section 6.3). Safety significant aspects of the radiation safety organization are controlled by the TSs. Arriving at a conclusion that the TSs are acceptable along with the review of Chapter 11 discussed above should allow the NRC reviewer to conclude with reasonable assurance that the administrative aspects of radiation safety is acceptable. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1.

12.2 Review and Audit Activities

The detailed staff review for this section should be limited to TSs. Applicable TSs are in the area of administrative controls (see ANS-15.1 – Section 6.2). Safety significant aspects of review and audit activities are controlled by the TSs. Arriving at a conclusion that the TSs are acceptable should allow the NRC reviewer to conclude with reasonable assurance that review and audit activities are acceptable. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1.

12.2.1 Composition and Qualifications

The detailed staff review for this section should be limited to TSs. Applicable TSs are in the area of administrative controls (see ANS-15.1 – Section 6.2.1). Safety significant aspects of the composition and qualifications of the review and audit function are controlled by the TSs. Arriving at a conclusion that the TSs are acceptable should allow the NRC reviewer to conclude with reasonable assurance that the composition and qualifications of the review and audit function are acceptable. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1.

12.2.2 Charter and Rules

The detailed staff review for this section should be limited to TSs. Applicable TSs are in the area of administrative controls (see ANS-15.1 – Section 6.2.2). Safety significant aspects of the charter and rules for the review and audit function are controlled by the TSs. Arriving at a conclusion that the TSs are acceptable should allow the NRC reviewer to conclude with reasonable assurance that the charter and rules of the review and audit function is acceptable. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1.

12.2.3 Review Function

The detailed staff review for this section should be limited to TSs. Applicable TSs are in the area of administrative controls (see ANS-15.1 – Section 6.2.3). Safety significant aspects of the review function are controlled by the TSs. Arriving at a conclusion that the TSs are acceptable should allow the NRC reviewer to conclude with reasonable assurance that the review function is acceptable. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1.

12.2.4 Audit Function

The detailed staff review for this section should be limited to TSs. Applicable TSs are in the area of administrative controls (see ANS-15.1 – Section 6.2.4). Safety significant aspects of the audit function are controlled by the TSs. Arriving at a conclusion that the TSs are acceptable should allow the NRC reviewer to conclude with reasonable assurance that the audit function is acceptable. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1.

12.3 Procedures

The detailed staff review for this section should be limited to TSs. Applicable TSs are in the area of administrative controls (see ANS-15.1 – Section 6.4). Safety significant aspects of procedures are controlled by the TSs. Arriving at a conclusion that the TSs are acceptable should allow the NRC reviewer to conclude with reasonable assurance that the procedures are acceptable. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1.

12.4 Required Actions

The detailed staff review for this section should be limited to TSs and confirming that licensee required actions meet the requirements of the regulations in 10 CFR 50.36. Applicable TSs are in the area of administrative controls (see ANS-15.1 – Section 6.6). Safety significant aspects

of required actions are controlled by the TSs. If the required actions are consistent with Section 6.6 of ANS-15.1, the actions will meet the requirements of 10 CFR 50.36. Arriving at a conclusion that the TSs are acceptable should allow the NRC reviewer to conclude with reasonable assurance that required actions are acceptable. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1.

12.5 Reports

The detailed staff review for this section should be limited to TSs and confirming that licensee required reports meet the requirements of the regulations in 10 CFR 50.36. Note that there are other reporting requirements in the regulations if certain requirements are not met. Not all reports that licensees could be required to make under the regulations if certain initiating events occur are covered in the TSs. Applicable TSs are in the area of administrative controls (see ANS-15.1 – Section 6.7). Safety significant aspects of reporting are controlled by the TSs. If the reporting is consistent with Section 6.7 of ANS-15.1, the actions will meet the requirements of 10 CFR 50.36. Arriving at a conclusion that the TSs are acceptable should allow the NRC reviewer to conclude with reasonable assurance that reporting is acceptable. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1.

12.6 Records

The detailed staff review for this section should be limited to TSs and confirming that licensee required records meet the requirements of the regulations in 10 CFR 50.36. Applicable TSs are in the area of administrative controls (see ANS-15.1 – Section 6.8). Safety significant aspects of records are controlled by the TSs. In addition to the records to be retained for the lifetime of the reactor facility given in Section 6.8.3 of ANS-15.1, 10 CFR 50.36 requires the records of reviews of violations of safety limits, limiting safety system settings and limiting conditions for operation to be retained for the life of the facility. Arriving at a conclusion that the TSs are acceptable should allow the NRC reviewer to conclude with reasonable assurance that records are acceptable. The reviewer should confirm that the proposed TSs are consistent with the guidance of the SRP and ANS-15.1 with the addition discussed above.

12.7 Emergency Planning

All licensees subject to this focused review plan have NRC-approved emergency plans in place. If a licensee has submitted a revision to their emergency plan as part of the license renewal application, a decision will be made on a case-by case basis if the revised plan is to be reviewed as part of license renewal.

If the licensee has proposed no changes to the emergency plan as part of license renewal, then the NRC-approved plan continues in place and any review of the emergency plan is outside the scope of a focused renewal review.

12.8 Security Planning

All licensees subject to this focused review plan have NRC-approved security plans in place. The NRC has focused on and has enhanced security at RTRs in the wake of the September

11th attacks. If a licensee has submitted a revision to their security plan as part of the license renewal application, a decision will be made on a case-by case basis if the revised plan is to be reviewed as part of license renewal.

If the licensee has proposed no changes to the security plan as part of license renewal, then the NRC-approved plan continues in place and any review of the security plan is outside the scope of a focused renewal review.

12.9 Quality Assurance

None of the licensees subject to this focused review plan require reviews of quality assurance. This section of the SRP is out of scope.

12.10 Operator Training and Regualification

All licensees subject to this supplemental guidance have NRC-approved operator training and requalification plans in place. The administrative aspects of training are discussed in Section 12.1.4 above. If a licensee has submitted a revision to their operator training and requalification plan as part of the license renewal application, a decision will be made on a case-by case basis if the revised plan is to be reviewed as part of license renewal.

If the licensee has proposed no changes to the operator training and requalification plan as part of license renewal, then the NRC-approved plan continues in place and any review of the operator training and requalification plan is outside the scope of a focused renewal review.

12.11 Startup Plan

None of the licensees subject to this focused review plan require review of startup plans. This section of the SRP is out of scope.

12.12 Environmental Reports

NRC must comply with the National Environmental Protection Act of 1969, as amended, and recognizes a continuing obligation to conduct its domestic licensing in a manner that is receptive to environmental concerns. This means that in licensing actions we request that RTRs address environmental concerns. For this review topic, the reviewer should follow the guidance of the SRP.

13. ACCIDENT ANALYSES

The accident analyses chapter of the SAR is one of the primary review areas of the focused review plan. The reviewer should follow the guidance in the SRP for this chapter. In this chapter the licensee should show that the health and safety of the public and workers are protected and that the applicant has considered potential radiological consequences in the event of malfunctions and the capability of the facility to accommodate such disturbances. The major purpose of this chapter is for the applicant to demonstrate that the facility design features, safety limits, limiting safety system settings, and limiting conditions for operation have been selected to ensure that no credible accident could lead to unacceptable radiological consequences to people or the environment.

The accident analysis in most cases depends on other sections of the SAR. For example, the licensee may take credit for the operation of ESFs to mitigate the consequences of accident scenarios. In that case, the NRC staff would need to review the design and operation of the ESFs discussed in Chapter 6. Other chapters of this focused review plan identify sections of the SAR that impact the accident analysis. The reviewer needs to review these additional SAR sections as applicable to the reactor under review. The discussion in the SAR will help the reviewer decide what additional areas need review and the depth of review needed.

References to other chapters of the SAR that may need to be reviewed are discussed for the initiating events below. However, because of the large number of potential initiating events, the references may not be complete and the reviewer still needs to evaluate each SAR on a case-by-case basis.

Postulated events are placed in categories as shown in the introduction of Chapter 13. A MHA, which in most cases involves the escape of fission products from fuel or fueled experiments and their release to the unrestricted environment, is the most hazardous radiological accident conceivable at a research reactor. The MHA bounds all credible accidents. The evaluation of other postulated event categories should show that the MHA is bounding.

The acceptance criteria portion of this section of the SRP discusses applying differing occupational and public dose standards for accidents at research reactors based on the date of initial licensing. That guidance does not apply to the licensees subject to this focused review plan. The requirements in 10 CFR 50.51(a) imposes a limit of 40 years on the length of an operating license. At the end of the 40 years, a new license must be issued. If the proposed duration of the requested license renewal when added to the amount of time that has passed since the operating license was issued exceeds 40 years (which is the case for all of the license renewal requests subject to this focused review plan), then the license is not renewed but rather, a superseding renewed license is issued.

Because this is a new license, acceptance criteria based on the date of the initial license as discussed in the SRP is no longer applicable. Only the requirements of 20.1001 through 20.2402 apply (what the SRP calls the new Part 20). The occupational and public dose limits changed with the adoption of revisions to 10 CFR Part 20 in 1994 and the NRC reviewer should ensure that the results of the accident analysis meet the revised regulations. The most significant change resulted in the public dose limits changing from a whole body dose of 0.5 rem and thyroid dose of 3 rem to a total effective dose equivalent (TEDE) of 0.1 rem (10 CFR 20.1301).

Meeting this lower public dose limit for accident scenarios may be a challenge for some licensees who designed their facilities in accordance with the old 10 CFR Part 20 dose limits. In that case, the requirements of 10 CFR 20.1301(d) may be considered. This regulation allows a higher public dose limit as follows:

- (d) A licensee or license applicant may apply for prior NRC authorization to operate up to an annual dose limit for an individual member of the public of 0.5 rem (5 mSv). The licensee or license applicant shall include the following information in this application:
 - (1) Demonstration of the need for and the expected duration of operations in excess of the limit in paragraph (a) of this section;

- (2) The licensee's program to assess and control dose within the 0.5 rem (5 mSv) annual limit; and
- (3) The procedures to be followed to maintain the dose as low as is reasonably achievable.

The licensee must apply for the higher dose limit as part of their renewal application and include the required information (the reviewer may need a RAI). The need and program to assess and control dose within the 0.5 rem annual limit should be demonstrated by the licensee's accident analysis and confirmed by the NRC staff finding that the analysis is acceptable. The expected duration is for the period of the renewal. The NRC inspection program should review the licensee's as low as is reasonably achievable program (ALARA). A conclusion by the inspection program that the licensee's procedures meet the requirements of 10 CFR 20.1101(b) is sufficient for the NRC reviewer to conclude that condition (3) above is met.

For those facilities that have undergone HEU to LEU fuel conversions under NUREG-1537, a conversion SAR and NRC staff SER exists which discusses some aspects of accident analysis. The NRC reviewer, after verifying that the information and conclusions in the SER remain accurate and valid, may use the conversion SER as input to the renewal SER.

13.1 Accident-Initiating Events and Scenarios

This section of the SAR discusses potential accident initiating events and scenarios. While the SRP treats the discussion of determination of consequences as a separate section, in reality, initiating events, accident analysis and consequence determination are discussed together in the SAR.

13.1.1 Maximum Hypothetical Accident

The reviewer should follow the guidance in the SRP. The evaluation of the MHA could involve other chapters of the SAR. For example, fuel element failure and release of fission product scenarios could involve the identification of the maximum powered fuel element in the reactor core and calculations of the fission product inventory in the element from Chapter 4, "Reactor Description," of the SAR. For MHAs that involve the failure of fueled experiments, the reviewer may need to refer to Chapter 10, "Experimental Facilities and Utilization." If the MHA scenario involves the use of engineered safety features to mitigate the consequences of the MHA, then applicable parts of Chapter 6, "Engineered Safety Features," would be reviewed. Chapter 11, "Radiation Protection Program and Waste Management," may need to be reviewed to verify calculation methodology for doses to reactor staff and members of the public.

13.1.2 Insertion of Excess Reactivity

The reviewer should follow the guidance in the SRP. Evaluation of this accident may require the reviewer to review parts of Chapter 4, "Reactor Description," for information on equipment such as control rods, Chapter 6, "Engineered Safety Features," if the licensee takes credit for ESFs, Chapter 7, "Instrumentation and Control Systems," if the I&C system is involved in the accident scenario and Chapter 10, "Experimental Facilities and Utilization," if experiment failure initiates the insertion of excess reactivity.

13.1.3 Loss of Coolant

The reviewer should follow the guidance in the SRP. Evaluation of this accident may require the reviewer to review parts of Chapter 4, "Reactor Description," for information on the reactor pool, biological shield, and the fission product inventory generating decay heat; Chapter 5, "Reactor Coolant Systems," if reactor coolant system failure is an initiating event; Chapter 6,

"Engineered Safety Features," if the licensee takes credit for ESFs; Chapter 10, "Experimental Facilities and Utilization," if an experimental facility failure, such as a beam tube, is an initiating event; and Chapter 11, "Radiation Protection Program and Waste Management," to verify calculation methodology for doses to reactor staff and members of the public.

13.1.4 Loss of Coolant Flow

Because the licensees subject to this focused review plan cool their reactor cores by natural convection, this is not a bounding or significant accident. However, it is still evaluated and the reviewer should follow the guidance in the SRP. Evaluation of this accident may require the reviewer to review parts of Chapter 5, "Reactor Coolant Systems," for initiating event and system response.

13.1.5 Mishandling or Malfunction of Fuel

The reviewer should follow the guidance in the SRP. The evaluation of this accident may require the reviewer to review parts of Chapter 4, "Reactor Description," for calculations of the fission product inventory in fuel elements; Chapter 6, "Engineered Safety Features," if the licensee takes credit for ESFs to mitigate the consequences of the accident; Chapter 9, "Auxiliary Systems," for information on handling and storage of fuel, and Chapter 11, "Radiation Protection Program and Waste Management," to verify calculation methodology for doses to reactor staff and members of the public.

13.1.6 Experiment Malfunction

The reviewer should follow the guidance in the SRP. The evaluation of this accident may require the reviewer to review parts of Chapter 10, "Experimental Facilities and Utilization." Because of the wide variety of experiments performed at RTRs, a number of other SAR chapters could also be impacted.

13.1.7 Loss of Normal Electrical Power

The reviewer should follow the guidance in the SRP. The evaluation of this accident may require the reviewer to review parts of Chapter 8, "Electrical Power Systems."

13.1.8 External Events

This class of accidents is initiated by some outside effect on the facility either caused by nature or humans. The NRC reviewer should follow the guidance in the SRP. If the last NRC review in this area was comprehensive, the review can be limited to determining if there have been any changes to the site characteristics that would result in a new initiating event or if there have been changes to structures and components that would change their response to an external

event. These should be identified in the SAR. Evaluation of this accident may require the reviewer to review part of Chapter 2, "Site Characteristics," for initiating events and 3, "Design of Structures, System, and Components," if external events have the potential to cause the failure of structures, systems or components.

13.1.9 Mishandling or Malfunction of Equipment

The NRC reviewer should follow the guidance in the SRP. The specific equipment mishandled or malfunctioning will determine what other sections of the SAR need to be reviewed.

13.2 Accident Analysis and Determination of Consequences

The NRC reviewer should follow the guidance in the SRP. If the reviewer identifies issues during the review of the determination of consequences (doses) for accident events, there is a very high chance that similar issues exist in the licensee's calculations of doses from routine effluents in Chapter 11. The reviewer should also look at the licensee's treatment of routine doses if problems are discovered in the area of accident doses.

13.3 Summary and Conclusions

The NRC reviewer should follow the guidance in the SRP.

14. TECHNICAL SPECIFICATIONS

TSs is one of the primary review areas of the focused review plan. The reviewer should follow the guidance in Chapter 14 of the SRP. The current version of ANS-15.1 is the 2007 version which this focused review plan is based on and which should be used by the reviewer. However, for the majority of TSs submitted with renewal applications subject to this focused review plan, if the licensee used ANS-15.1 for guidance, it was most likely the 1990 version of the standard. The reviewer should understand the differences, which are minor, between the two versions of the standard.

TSs and their bases are discussed in the applicable sections of the SAR, SRP and this focused review plan. However, because the focused renewal review process has primary focus areas, the SER should contain a TS chapter that discusses all facility TSs that do not fall under the SER sections on the reactor and accident analysis. The TSs and where applicable, their bases, should be presented along with a discussion and justification of why NRC finds the proposed TSs to be acceptable.

A standard conclusion section for review of TSs has been developed and can be used in this section of the SER. A template for the conclusions section of Chapter 14 of the SER is presented below. Brackets contain information that is review dependent that the NRC reviewer should address as applicable to the license renewal application under review.

START OF SECTION 14 CONCLUSION TEMPLATE

The staff has evaluated the TSs as part of its review of the application for renewal of Facility License No. R-[LICENSE NUMBER]. The TSs define certain features, characteristics, and conditions governing the operation of the [REACTOR FACILITY]. The TSs are explicitly included in the renewed license as Appendix A. The staff reviewed the format and content of the TSs for consistency with the guidance found in ANSI/ANS-15.1-2007 and NUREG-1537. The staff specifically evaluated the content of the TSs to determine if the TSs meet the requirements in 10 CFR 50.36. The staff concluded that the

[REACTOR FACILITY] TSs do meet the requirements of the regulations. The staff based this conclusion on the following findings:

- To satisfy the requirements of 10 CFR 50.36(a), the licensee provided proposed TSs with the application for license renewal. As required by the regulations, the proposed TSs included appropriate summary bases for the TSs. Those summary bases are not part of the TSs.
- The [REACTOR FACILITY] is a facility of the type described in 10 CFR 50.21(c), and therefore, as required by 10 CFR 50.36(b), the facility license will include the TSs. To satisfy the requirements of 10 CFR 50.36(b), the licensee provided TSs derived from analyses in the [REACTOR FACILITY] SAR.
- To satisfy the requirements of 10 CFR 50.36(c)(1), the licensee provided TSs specifying a safety limit on the fuel temperature and LSSSs for the reactor protection system to preclude reaching the safety limit.
- The TSs contain LCOs on each item that meets one or more of the criteria specified in 10 CFR 50.36(c)(2)(ii).
- The TSs contain surveillance requirements that satisfy the requirements of 10 CFR 50.36(c)(3).
- The TSs contain design features that satisfy the requirements of 10 CFR 50.36(c)(4).
- The TSs contain administrative controls that satisfy the requirements of 10 CFR 50.36(c)(5). The licensee's administrative controls contain requirements for initial notification, written reports, and records that meet the requirements specified in 10 CFR 50.36(c)(1),(2),(7), and (8).

The staff finds the TSs to be acceptable and concludes that normal operation of the [REACTOR FACILITY] within the limits of the TSs will not result in radiation exposures in excess of the limits specified in 10 CFR Part 20 for members of the general public or occupational exposures. The staff also finds that the TSs provide reasonable assurance that the facility will be operated as analyzed in the [REACTOR FACILITY] SAR, and adherence to the TSs will limit the likelihood of malfunctions and the potential accident scenarios discussed in accident analysis chapter 13 of this SER.

END OF SECTION 14 CONCLUSION

TEMPLATE

15. FINANCIAL QUALIFICATIONS

Review of financial qualifications will be performed by the Financial, Policy and Rulemaking Branch.

16. OTHER LICENSE CONSIDERATIONS

16.1 Prior Use of Reactor Components

This section of the SAR discusses how components were used in the past. The components that this section focuses on are fuel elements, control rods, and safety-related components of the reactor protection system. Aging of fuel elements and control rods should be included by the reviewer as part of Chapter 4.

The TS requirements for the I&C systems provide reasonable assurance that degradation of system components will be detected. If the aging failure of the reactor protection system is identified as an accident initiator in Chapter 13, then the reviewer should review the identified components using the SRP.

16.2 Medical Use of Non-Power Reactors

This section of the SRP is outside of the scope of the focused review plan and none of the reactors subject to the focused review plan use their reactors for medical use.

17. DECOMMISSIONING AND POSSESSION-ONLY LICENSE AMENDMENTS

This chapter of the SRP is outside of the scope of the focused review plan. Financial aspects of decommission are part of the Chapter 15 review.

18. HIGHLY ENRICHED TO LOW-ENRICHED URANIUM CONVERSIONS

This chapter of the SRP is outside of the scope of the focused review plan.

OVERALL CONCLUSION SECTION OF THE SER

Note that this section is not contained in the SRP.

The license renewal SER had a chapter that contains the overall conclusions of the NRC staff's review. A template for this section of the SER is given below. Brackets contain information that is review dependent that the NRC reviewer should address as applicable to the license renewal application under review.

START OF THE SER CONCLUSION TEMPLATE

On the basis of its evaluation of the application as discussed in the previous chapters of this SER, the staff concludes the following:

- The application for license renewal dated [provide date], as supplemented, complies with the standards and requirements of the Atomic Energy Act, and the Commission's rules and regulations set forth in Title 10 of the *Code of Federal Regulations*.
- The facility will operate in conformity with the application, as well as the provisions of the Atomic Energy Act and the rules and regulations of the Commission.
- There is reasonable assurance that (1) the activities authorized by the renewed license can be conducted at the designated location without endangering the health and safety of the public, and (2) such activities will be conducted in compliance with the rules and regulations of the Commission.
- The licensee is technically and financially qualified to engage in the activities authorized by the renewed license in accordance with the rules and regulations of the Commission.
- The issuance of the renewed license will not be inimical to the common defense and security or to the health and safety of the public.

END OF THE SER CONCLUSION TEMPLATE