POLICY ISSUE
INFORMATION

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FOR: The Commissioners

FROM: R. W. Borchardt
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SUBJECT: LONG-TERM PLAN FOR ENHANCING THE RESEARCH AND TEST REACTOR LICENSE RENEWAL PROCESS AND STATUS OF THE DEVELOPMENT AND USE OF THE INTERIM STAFF GUIDANCE

PURPOSE:

To provide a long-term plan (LTP) for enhancing the license renewal process for research and test reactors (RTRs) for the Commission's review and approval, and to provide the status of the development and use of interim staff guidance (ISG) for the renewal of research reactor licenses. This paper responds to two actions from the staff requirements memorandum (SRM) SECY-08-0161, entitled "Review of Research and Test Reactor License Renewal Applications," dated March 26, 2009.

SUMMARY:

This paper provides the Commission with information on the development and preliminary use of the draft ISG, which incorporates a risk screening process (Enclosure 1). This paper also provides the Commission with the LTP to streamline and enhance the RTR license renewal process. This plan involves the development of a regulatory basis to support rulemaking and is described in Enclosure 2, "Long-Term Plan."

BACKGROUND:

In SECY-08-0161, "Review of Research and Test Reactor License Renewal Applications," dated, October 24, 2008, the U.S. Nuclear Regulatory Commission (NRC) staff provided the

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Commission with information regarding plans to improve the review of license renewal applications for RTRs. The Commission responded in the SRM for SECY-08-0161, dated March 26, 2009, and directed the staff, to proceed with several actions. This paper is the third of three short-term communications to the Commission called for in SRM-SECY-08-0161. In a memorandum entitled, "Resource Plan for a Review of Research and Test Reactors License Renewal Applications," dated May 27, 2009, the staff provided resource estimates for the conduct of many short-term and some long-term actions related to streamlining RTR license renewal. The staff provided a second memorandum entitled, "Status of Short-term Program Initiatives for the Review of Research and Test Reactor License Renewal Applications," dated May 27, 2009, which updated the status of short-term program initiatives, including the preliminary development of the draft ISG for research reactor license renewal.

DISCUSSION:

Interim Staff Guidance

The staff is developing draft ISG to provide a streamlined review process that it will apply to the backlogged research reactor license renewal applications, in accordance with Commission and management direction. The NRC staff conducted public meetings on September 15, 2008, and March 25, 2009, to discuss potential changes to the license renewal process, and on June 4, 2009, to discuss the streamlined process and the draft ISG with stakeholders. The stakeholders had the opportunity to review the draft ISG before the June 4th public meeting and they were generally supportive of the staff's plans to carry out license renewal streamlining and the implementation of the draft ISG. Notice of the availability of the draft ISG will also be published in the Federal Register for a 30 day comment period to further facilitate stakeholder involvement. The staff will consider insights provided from the RTR community, as well as those from other external stakeholders in developing the final ISG. Although the ISG is not yet final, the staff is applying elements of the draft ISG to planning activities and work on license renewals to eliminate the backlog. Enclosure 1 contains details of the draft ISG.

Long-Term Plan

The NRC staff believes that the focus of the LTP should consist of rulemaking and the concurrent development of coordinating guidance. The staff will draft a regulatory basis to support proceeding with rulemaking to streamline and enhance the RTR license renewal process. This regulatory basis would address the technical, legal, and policy issues associated with all of the contemplated rulemaking provisions. The LTP, detailed in Enclosure 2, describes some potential rulemaking recommendations, followed by key elements that require further review. As with all NRC rulemaking, stakeholder feedback will be important throughout the process, and will be solicited through various methods, including a public meeting.

RESOURCES:

The staff response to SRM-SECY-08-0161 entitled, "Resource Plan for a Review of Research and Test Reactors License Renewal Application," identifies the resources necessary for this work (Agencywide Documents Access and Management System Accession Number ML091110164). The long-term plan resources for Fiscal Year (FY) 2010 have been included on the FY 2010 shortfall list and resources for FY 2011 are being addressed through the FY 2011 Planning, Budgeting, and Performance Management Process.

Budgeted Resources for LTP Rulemaking

Long-Term Plan	FY 2010 (FTE)	FY 2011 (FTE)
Research and Test Reactors Branch B (Project Management)	0.2	[redacted]
Research and Test Reactors Branch A (Technical Basis)	0.5	[redacted]

CONCLUSIONS:

The staff will develop a regulatory basis to support proceeding with rulemaking to streamline and enhance the RTR license renewal process.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objection.
The Chief Financial Officer reviewed this package and determined that it has no financial impact.

This paper contains resource information currently in the budget review process; therefore we request it not be made publicly available.

/RA/

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Enclosures:
1. Interim Staff Guidance
2. Long-Term Plan

INTERIM STAFF GUIDANCE

As directed by the staff requirements memorandum (SRM) to SECY-08-0161, dated March 26, 2009, the staff of the U. S. Nuclear Regulatory Commission (NRC) has developed interim staff guidance (ISG) regarding a streamlined review process that will apply to the outstanding research and test reactor (RTR) license renewals. The NRC staff conducted public meetings on September 15, 2008, and March 25, 2009, to discuss potential changes to the license renewal process and June 4, 2009, to discuss the details of the streamlined process and the draft ISG with stakeholders.

In keeping with the Commission's direction, a graded approach based on licensed power level determines the basic license renewal process applied to each licensee. Facilities are divided into two tiers. Facilities with licensed power levels of 2 megawatts thermal (MW(t)) and greater undergo a full review using the standard review plan (SRP) in NUREG-1537, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors," issued February 1996. Facilities with licensed power levels 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. The staff has developed a focused review plan based on NUREG-1537 as part of the ISG.

A power level of 2 MW(t) or greater is a longstanding regulatory demarcation of risk. Currently, the NRC has five licensed RTR facilities with a power level of 2 MW(t) or greater; two of these are in the license renewal backlog. Reactors at or above this power level have enhanced security requirements and may need to protect against sabotage in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 73.60(f). The inspection program also uses this power level to define Class I reactors for which the staff completes the inspection program on a annual cycle rather than biennially as it does 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, which is different than lower powered RTRs. This demarcation also recognizes that fission product inventories, which are related to potential dose during accident conditions, increase with power level. Finally, this demarcation is also consistent with insights gained from the RTR security assessments.

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

- reactor design and operation
- accident analysis
- technical specifications (TS)

The staff will use applicable sections of the SRP to perform the review. The ISG includes a focused review plan that provides guidance to the NRC reviewer about using the SRP to conduct a focused review. The staff will also perform an environmental assessment to meet the requirements of 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." Secondary level reviews will occur in areas such as financial assurance and radiation protection to meet the requirements of 10 CFR 50.33, "Content of Applications; General Information," and 10 CFR 50.34, "Contents of construction permit and operating license applications; technical information."

The reactor design and operation review will focus on the reactor core, reactor fuel, control rods, neutron moderator and reflector, normal operating conditions such as shutdown margin and excess reactivity, core physics parameters, operating limits, and thermal-hydraulic design. For some license renewal application reviews, to verify conclusions presented in the SAR, the NRC staff may choose to perform independent neutronic and thermal-hydraulic calculations to verify licensee analyses. The staff will make this determination based on the level of detail provided in the application. Calculations performed by NRC that can be used in other license reviews, such as core configuration changes or power increases, can be done in a more efficient manner. The accident analysis includes evaluation of the maximum hypothetical accident 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.

The TS review is based on the guidance in the SRP and American National Standard (ANS) 15.1-2007, "The Development of Technical Specifications for Research Reactors." The TS review will ensure compliance with 10 CFR 50.36, "Technical Specifications." The review will confirm that the proposed TS are acceptable and have sufficient bases.

Except as needed to review the areas of focus discussed above (e.g., the staff may need to review aspects of engineered safety features as part of the accident review if the licensee has taken credit for engineering safety features performance), the staff will not conduct an indepth 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, the NRC staff has already reviewed these areas, either as part of the initial licensing review for the facility or as part of a past license renewal, and found them acceptable. The NRC may have already reviewed changes in these areas, made since the last NRC initial or renewal review and outside of the scope of the current focused review, as part of a license amendment. In addition, changes may have occurred under the authority of 10 CFR 50.59, "Changes, Tests and Experiments." The NRC would have inspected the licensee's process for conducting 10 CFR 50.59 reviews, and the facility project manager would have screened the technical evaluations.

The staff conducted a public meeting on June 4, 2009, to explain the draft ISG to the public and solicit comments. Generally, the ISG was well received by the attendees. The staff is reviewing the comments, and the final ISG will reflect those that the staff accepts.

The staff is using the draft ISG for planning purposes. Estimates of resources needed to eliminate the license renewal backlog are based on the focused review plan described in the ISG and provided to the Commission in SECY-09-0153, "Resource Plan for a Review of Research and Test Reactors License Renewal," dated, May 27, 2009. The staff is developing statements of work for contractor support to perform renewal reviews based on the ISG.

Preliminary review activities before the support contracts begin are in progress and are based on the ISG. The staff has started work on a review of a license renewal for a research reactor based on the draft ISG.

LONG-TERM PLAN

The U.S Nuclear Regulatory Commission (NRC) staff evaluated the issues contributing to the backlog of research and test reactors (RTR) license renewal applications which were described in SECY-08-0161, "Review of Research and Test Reactor License Renewal Applications," dated October 24, 2008, and believes that a regulatory basis needs to be developed to fully review the current regulatory structure, evaluate streamlining the regulatory process, and explore options for rulemaking. This regulatory basis will allow for a comprehensive and complete review of the rules and guidance associated with RTR license renewal.

In support of this approach, the NRC staff identified four potential areas, based on the current license renewal regulatory structure and the staff's experience in renewing RTR licenses, where rulemaking would enhance the RTR license renewal process. These involve: (1) the "timely renewal" provision of Title 10 of the *Code of Federal Regulations* (10 CFR) 2.109, "Effect of Timely Renewal Application," (2) periodic safety analysis report (SAR) updates, (3) license renewal application conformance to NUREG-1537, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors," issued February 1996, and (4) technical specification (TS) conformance to American National Standard (ANS) 15.1, "The Development of Technical Specifications for Research Reactors." The agency will need to fully vet these four areas, described in greater detail below, in a regulatory basis:

(1) The "Timely Renewal" Provision of 10 CFR 2.109

The NRC staff has recognized that the "timely renewal" provision, as specified in 10 CFR 2.109(a), can present a challenge to license renewal efforts. This regulation allows an RTR to continue operation as long as the NRC has received a renewal application within 30 days before the expiration of the existing license. If the NRC receives a low-quality license renewal application, the staff has the option to respond with requests for additional information (RAIs) or to reject the application. If the application is rejected, the licensee would have to cease operations and shut down the facility at the expiration of the license. The staff recommends changing this requirement so that licensees are required to submit license renewal requests much earlier than the current 30 days before expiration. For example, if RTR licensees are required to submit their license renewal applications 2 years before expiration of the existing license, the NRC would have enough time to evaluate the submittal and, if necessary, reject the application if it lacked sufficient detail or information. This additional time would allow the licensees to provide the necessary information without having to shut down their facilities.

(2) Periodic SAR Updates

No regulations exist that require RTR licensees to periodically update their SARs. Power reactors must update their SARs annually to conform to 10 CFR 50.71, "Maintenance of Records." Although it is a good practice to maintain SARs with current information, some facilities have not done so. As such, these facilities struggle with license renewal, which requires an updated SAR. This leads to a lengthy NRC staff review and the use of RAIs. The staff recommends considering the development of a requirement for RTRs to periodically update their SARs to improve this situation.

(3) License Renewal Application Conformance to NUREG-1537

NUREG-1537 provides guidance on the standard format and content for RTR license renewal applications. However, many of the existing RTR SARs pre-date the inception of this NUREG in 1996. Licensees submit older versions of the SARs that do not conform to NUREG-1537, leading to numerous staff questions and RAIs. During the public meeting on March 25, 2009, to discuss streamlining the license renewal process, one licensee suggested that the NRC require conformance to NUREG-1537. The NRC staff will explore ways to increase the use of NUREG-1537 as the standard format and content for RTR license renewal applications.

(4) TS Conformance to ANS-15.1

RTR TS vary in their level of detail, which in turn leads to numerous NRC staff questions and RAIs during the license renewal review. ANS-15.1 provides a structure for RTRs to use to provide consistent TS submittals for license renewal. During the public meeting on March 25, 2009, the licensees agreed that updating the TS to conform to ANS-15.1 would be of benefit. The NRC staff is currently drafting a regulatory guide that will endorse the information described in ANS-15.1 and will continue to explore ways to increase the use of ANS-15.1 in RTR TSs.

In addition to these specific areas to consider for rulemaking, the staff believes that other areas could benefit from a regulatory review to determine the need for additional rulemaking or guidance updates. These seven ideas are briefly discussed below, but they will require a more detailed evaluation before the staff can recommend rulemaking.

The staff also recommends investigating the following ideas:

(1) Evaluate The Extended License Term, Generic Analysis Approach, And Generic Siting Analysis (as described in SECY-08-0161)

In SECY-08-0161, the staff outlined several approaches to enhancing the license renewal process, such as an extended license term, generic analysis, and generic siting analysis. A preliminary review of these three options appears below; however, in order to fully assess these options as part of a comprehensive long-term plan (LTP); the staff will need to conduct a more detailed and comprehensive evaluation:

(a) The extended license term process could potentially provide significant benefit to RTR licensees while ensuring that the NRC continues to maintain adequate protection of the public and the environment. The staff would need to perform a technical evaluation to determine the length of any extended license term that would be justified.

(b) The generic analysis approach would be similar to the NRC's topical report process and would involve the NRC review and approval of an RTR generic design safety analysis. This process could potentially benefit licensees with similar reactor designs (e.g., TRIGA reactors and, possibly, to a lesser extent,

reactors that use material test reactor-type fuel) or reactors with a power level below a specific threshold (e.g., 2 megawatts thermal). In this approach, the source term could be generically evaluated and a bounding safety analysis could be established that demonstrates compliance with 10 CFR Part 20, "Standards for Protection Against Radiation," for any normal or accident condition. This bounding safety analysis could be used to minimize the amount of information that the licensee must submit for license renewal.

(c) The generic siting analysis would provide siting information that licensees could reference in their renewal applications. Because many aspects of siting (e.g., meteorology, seismology) do not vary significantly with time, the NRC staff will consider revising guidance to licensees on the scope of siting information needed for license renewal.

(2) Evaluate The Focused Review License Renewal Process

The LTP will evaluate the experience gained from application of the focused review license renewal process. The staff cannot effectively finalize the LTP without capturing the lessons learned from application of the focused review process. After completion of a few of the outstanding license renewals, the staff will examine the successes and challenges encountered in the application of the focused review process. This review should solicit stakeholder feedback. The staff will assess key attributes of the focused review process identified during the current license renewals for their effect on the efficiency of the LTP in addressing the license renewal process.

(3) Evaluate Potential Research Studies

The NRC staff received an unsolicited proposal from [redacted] If awarded, this contract could contribute to the regulatory basis for future license renewals of TRIGA reactors as well as any changes made in accordance with 10 CFR 50.59.

(4) Review Guidance Documents

Any permanent changes to the regulations will require the staff to review and potentially revise the RTR regulatory guides and NUREGs. The staff may need to document in NUREG-1537 components of the focused review, extended license term process, generic analysis approach, and consider any stakeholder-suggested process improvements adopted into the LTP. Currently, the staff is reviewing and revising the RTR regulatory guides as part of the Office of Nuclear Regulatory Research initiative to update all agency regulatory guides. The staff will evaluate changes as a result of any license renewal process amendments and incorporate them into existing or new documents as appropriate. Revised guidance documents will capture knowledge management information.

(5) Review Regulations Associated With Security, Emergency Preparedness, Financial Qualifications, and Operator Requalification Requirements

The staff needs to review regulations associated with requirements in these areas in more detail. For example, periodic updates may be needed to ensure the accuracy of information.

(6) Develop an Aging Management Program for RTRS

The staff considers aging management important to the successful LTP. Currently, few, if any, requirements exist to address this issue. The staff proposes a review of RTR aging issues in order to develop generic guidance that RTRs licensees can use to maintain their facilities safely.

(7) Consider Performance-Based Regulation for RTRS

Finally, the staff is considering the feasibility of incorporating a performance-based regulation regimen for RTRs. Although only a conceptual term at this point in the process, the NRC staff envisions a review of the current RTR regulatory structure that could lead to a set of overarching performance goals to guide the design of the performance-based regimen. The agency could then use performance indicators to direct inspection and licensing efforts towards more risk-prone areas and activities.

As with any new process, the staff will gather input from RTR licensees and other external stakeholders and use it to determine the benefit of any planned changes to the license renewal process. The staff will conduct a public meeting to discuss the various license renewal options under consideration.