UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 3, 2017

ALL AGREEMENT AND NON-AGREEMENT STATES
STATE LIAISON OFFICERS

NOTICE OF PROPOSED RULEMAKING: NON-POWER PRODUCTION OR UTILIZATION FACILITY LICENSE RENEWAL (STC-17-034)

PURPOSE: To provide notification of (1) the publication of the U.S. Nuclear Regulatory Commission's (NRC) notice of proposed rulemaking and request for comment in the *Federal Register*; and (2) an upcoming public meeting to discuss the proposed rulemaking.

BACKGROUND: The NRC is proposing to amend its regulations that govern the license renewal process for non-power reactors, testing facilities, and other production or utilization facilities, licensed under the authority of Section 103, "Commercial Licenses," Section 104a, or Section 104c, "Medical Therapy and Research and Development," of the Atomic Energy Act of 1954, as amended (AEA), that are not nuclear power reactors. In this proposed rule, the NRC collectively refers to these facilities as non-power production or utilization facilities (NPUFs). The NRC is proposing to: (1) eliminate license terms for licenses issued under the authority of Sections 104a or 104c of the AEA, other than for testing facilities; (2) define the license renewal process for licenses issued to testing facilities or under the authority of Section 103 of the AEA; (3) require all NPUF licensees to submit final safety analysis report updates to the NRC every 5 years; and (4) provide an accident dose criterion of 1 rem (0.01 Sievert (Sv)) total effective dose equivalent for NPUFs other than testing facilities. The proposed rule also includes other changes, as described in Section III, "Discussion," of the enclosed *Federal Register* notice. The NRC is soliciting public comments on the contemplated action through June 13, 2017, and invites stakeholders and interested persons to participate.

DISCUSSION: Enclosed with this letter is the *Federal Register* notice supporting the proposed rule, the environmental assessment finding that no significant environmental impact will result from this proposed rule, the draft regulatory and backfit analysis, and the draft regulatory guide DG-2006, "Preparation of Updated Final Safety Analysis Reports for Non-Power Production or Utilization Facilities". The proposed rule was published in the *Federal Register* (82 FR 15643) on March 30, 2017, and posted on the Federal e-rulemaking portal http://www.regulations.gov under Docket No. NRC-2011-0087. The *Federal Register* notice can be accessed at: https://www.federalregister.gov/documents/2017/03/30/2017-06162/non-power-production-or-utilization-facility-license-renewal. Comments on the proposed rule and supporting documents are due by June 13, 2017, and the *Federal Register* notice details how to submit comments.

A public meeting on the proposed rulemaking will be held in the near future. The notice for this meeting will be published at least 10 days in advance on the NRC's public meeting schedule web site at http://www.nrc.gov/pmns/mtg . The public meeting will be accessible by teleconference and webinar. The meeting notice will provide the bridge line information and the URL to register for the webinar.

If you have any questions regarding this correspondence, please contact the individual named below:

POINT OF CONTACT: Robert Beall E-MAIL: Robert.Beall@nrc.gov
TELEPHONE: (301) 415-3874

Sincerely,

/RA/

Daniel S. Collins, Director
Division of Material Safety, State, Tribal
and Rulemaking Programs
Office of Nuclear Materials Safety
and Safeguards

Enclosures:
1. Proposed Rule *Federal Register* Notice
2. Draft Environmental Assessment
3. Draft Regulatory and Backfit Analysis
4. Draft Regulatory Guide

[7590-01-P]

NUCLEAR REGULATORY COMMISSION

10 CFR Parts 2, 50, and 51

[NRC-2011-0087]

RIN 3150-AI96

Non-Power Production or Utilization Facility License Renewal

AGENCY: Nuclear Regulatory Commission.

ACTION: Proposed rule.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is proposing to amend its regulations that govern the license renewal process for non-power reactors, testing facilities, and other production or utilization facilities, licensed under the authority of Section 103, Section 104a, or Section 104c of the Atomic Energy Act of 1954, as amended (AEA), that are not nuclear power reactors. In this proposed rule, the NRC collectively refers to these facilities as non-power production or utilization facilities (NPUFs). The NRC is proposing to: eliminate license terms for licenses issued under the authority of Sections 104a or 104c of the AEA, other than for testing facilities; define the license renewal process for licenses issued to testing facilities or under the authority of Section 103 of the AEA; require all NPUF licensees to submit final safety analysis report (FSAR) updates to the NRC every 5 years; and provide an accident dose criterion of 1 rem (0.01 Sievert (Sv)) total effective dose equivalent (TEDE) for NPUFs other than testing facilities. The proposed rule also includes other changes, as described in Section III, "Discussion," of this document. The NRC is issuing concurrently draft Regulatory Guide (DG-2006), "Preparation of Updated Final Safety Analysis Reports for Non-power Production or Utilization Facilities," for review and comment. The NRC anticipates the proposed rule and associated draft implementing guidance would result in reduced burden on both licensees and the NRC, and would create a more responsive and efficient regulatory

framework that will continue to protect public health and safety, promote the common defense and security, and protect the environment. During the public comment period, the NRC plans to hold a public meeting to promote a full understanding of the proposed rule and facilitate the public's ability to submit comments on the proposed rule.

DATES: Submit comments by June 13, 2017. Submit comments specific to the information collections aspects of this proposed rule by May 1, 2017. Comments received after this date will be considered if it is practical to do so, but the Commission is able to ensure consideration only for comments received on or before this date.

ADDRESSES: You may submit comments by any of the following methods (unless this document describes a different method for submitting comments on a specific subject):

- **Federal rulemaking Web Site:** Go to http://www.regulations.gov and search for Docket ID NRC-2011-0087. Address questions about NRC dockets to Carol Gallagher; telephone: 301-415-3463; e-mail: Carol.Gallagher@nrc.gov. For technical questions, contact the individuals listed in the FOR FURTHER INFORMATION CONTACT section of this document.

- **E-mail comments to:** Rulemaking.Comments@nrc.gov. If you do not receive an automatic e-mail reply confirming receipt, then contact us at 301-415-1677.

- **Fax comments to:** Secretary, U.S. Nuclear Regulatory Commission at 301-415-1101.

- **Mail comments to:** Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, ATTN: Rulemakings and Adjudications Staff.

- **Hand deliver comments to:** 11555 Rockville Pike, Rockville, Maryland 20852, between 7:30 a.m. and 4:15 p.m. (Eastern Time) Federal workdays; telephone: 301-415-1677.

For additional direction on obtaining information and submitting comments, see "Obtaining Information and Submitting Comments" in the SUPPLEMENTARY INFORMATION section of this document.

FOR FURTHER INFORMATION CONTACT: Duane Hardesty, Office of Nuclear Reactor Regulation, telephone: 301-415-3724, e-mail: Duane.Hardesty@nrc.gov; and Robert Beall, Office of Nuclear Reactor Regulation, telephone: 301-415-3874, e-mail: Robert.Beall@nrc.gov. Both are staff of the U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

SUPPLEMENTARY INFORMATION:

EXECUTIVE SUMMARY:

A. Need for the Regulatory Action

The U.S. Nuclear Regulatory Commission (NRC) is proposing to amend its regulations related to the license renewal process for non-power reactors, testing facilities, and other production or utilization facilities, licensed under the authority of Section 103, Section 104a, or Section 104c of the Atomic Energy Act of 1954, as amended, that are not nuclear power reactors. In this proposed rule, the NRC collectively refers to these facilities as non-power production or utilization facilities (NPUFs). To establish a more efficient, effective, and focused regulatory framework, the NRC proposes revisions to parts 2, 50, and 51 of title 10 of the *Code of Federal Regulations* (10 CFR).

B. Major Provisions

In addition to administrative changes and clarifications, the proposed rule includes the following major changes:

- Creates a definition for “non-power production or utilization facility,” or “NPUF;”
- Eliminates license terms for facilities, other than testing facilities, licensed under 10 CFR 50.21(a) or (c);
- Defines the license renewal process for testing facilities licensed under § 50.21(c) and NPUFs licensed under 10 CFR 50.22;
- Requires all NPUF licensees to submit final safety analysis report updates to the NRC every 5 years;
- Amends the current timely renewal provision under 10 CFR 2.109, allowing facilities to continue operating under an existing license past its expiration date if the facility submits a license renewal application at least 2 years (currently 30 days) before the current license expiration date;
- Provides an accident dose criterion of 1 rem (0.01 Sievert) total effective dose equivalent for NPUFs other than testing facilities;
- Extends the applicability of 10 CFR 50.59 to NPUFs regardless of their decommissioning status;
- Clarifies an applicant’s requirements for meeting the existing provisions of 10 CFR 51.45 for submitting an environmental report; and
- Eliminates the requirement for NPUFs to submit financial qualification information with license renewal applications under 10 CFR 50.33(f)(2).

C. Costs and Benefits

The NRC prepared a draft regulatory analysis to determine the expected quantitative costs and benefits of the proposed rule and the draft implementing guidance, as well as

qualitative factors to be considered in the NRC's rulemaking decision. The analysis concluded that the proposed rule would result in net savings to licensees and the NRC (i.e., be cost beneficial). The analysis examined the benefits and costs of the proposed rule requirements and the draft implementing guidance relative to the baseline for the current license renewal process (i.e., the no action alternative). Relative to the no action baseline, the NRC estimates that total net benefits to NPUFs (i.e., cost savings minus costs) would be $3.8 million ($1.5 million using a 7 percent discount rate and $2.5 million using a 3 percent discount rate) over a 20-year period. The average NPUF would incur net benefits ranging from approximately $54,000 to $167,000 over a 20-year period. The NRC would incur total net benefits of $9.4 million ($3.8 million using a 7 percent discount rate and $6.4 million using a 3 percent discount rate) over a 20-year period.

The draft regulatory analysis also considered, in a qualitative fashion, additional benefits of the proposed rule and the draft implementing guidance associated with regulatory efficiency, protection of public health and safety, promotion of the common defense and security, and protection of the environment.

The draft regulatory analysis concluded that the proposed rule and the draft implementing guidance are justified because of the cost savings incurred by both licensees and the NRC while public health and safety is maintained. For a detailed discussion of the methodology and complete results, see Section VII, "Regulatory Analysis," of this document.

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I. Obtaining Information and Submitting Comments

A. Obtaining Information

Please refer to Docket ID NRC-2011-0087 when contacting the NRC about the availability of information for this action. You may obtain publicly-available information related to this action by any of the following methods:

- **Federal rulemaking Web Site:** Go to http://www.regulations.gov and search for Docket ID NRC-2011-0087.

- **NRC's Agencywide Documents Access and Management System (ADAMS):** You may obtain publicly-available documents online in the ADAMS Public Documents collection

at http://www.nrc.gov/reading-rm/adams.html. To begin the search, select "ADAMS Public Documents" and then select "Begin Web-based ADAMS Search." For problems with ADAMS, please contact the NRC's Public Document Room reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov. For the convenience of the reader, instructions about obtaining materials referenced in this document are provided in Section XVI, "Availability of Documents," of this document.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

B. Submitting Comments

Please include Docket ID NRC-2011-0087 in your comment submission.

The NRC cautions you not to include identifying or contact information that you do not want to be publicly disclosed in your comment submission. The NRC will post all comment submissions at http://www.regulations.gov as well as enter the comment submissions into ADAMS. The NRC does not routinely edit comment submissions to remove identifying or contact information.

If you are requesting or aggregating comments from other persons for submission to the NRC, then you should inform those persons not to include identifying or contact information that they do not want to be publicly disclosed in their comment submission. Your request should state that the NRC does not routinely edit comment submissions to remove such information before making the comment submissions available to the public or entering the comment into ADAMS.

II. Background

Sections 103 (for facilities used for commercial or industrial purposes) and 104a and c (for facilities used for medical therapy and useful for research and development activities, respectively) of the AEA establish the NRC's authority to license NPUFs. The section of the AEA that provides licensing authority for the NRC corresponds directly to the class of license issued to a facility (i.e., Section 104a of the AEA authorizes the issuance of a "class 104a" license). Sections 104a and c of the AEA require that the Commission impose only the minimum amount of regulation needed to promote the common defense and security, protect the health and safety of the public, and permit, under Section 104a, the widest amount of effective medical therapy possible and, under Section 104c, the conduct of widespread and diverse research and development.

The NRC regulates 36 NPUFs, of which 31 are currently operating. The other five facilities are in the process of decommissioning (i.e., removing a facility or site safely from service and reducing residual radioactivity to a level that permits release of the site for unrestricted use or use under restricted conditions, and termination of the license). Most NPUFs are located at universities or colleges throughout the United States. The NRC regulates one operating testing facility.

A. License Terms

The AEA dictates an initial license term of no more than 40 years for class 103 facilities, which the NRC licenses under § 50.22 of title 10 of the *Code of Federal Regulations* (10 CFR), but the AEA does not specify license terms for class 104a or c facilities, which are licensed under § 50.21(a) or (c). The regulation that implements this statutory authority, § 50.51(a), currently specifies that the NRC may grant an initial license for NPUFs for no longer than a 40-year license term. If the NRC initially issues a license for a shorter period, then it may renew the license by amendment for a maximum aggregate period not to exceed 40 years. An NPUF license is usually renewed for a term of 20 years. If the requested renewal would extend the

license beyond 40 years from the date of issuance, the original license may not be amended. Rather, the NRC issues a superseding renewed license.

Any application for license renewal or a superseding renewed license must include an FSAR describing: 1) changes to the facility or facility operations resulting from new or amended regulatory requirements, and 2) changes and effects of changes to the facility or procedures and new experiments. The FSAR must include the elements specified in § 50.34 and should be augmented by the guidance of NUREG-1537, Part 1, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors, Format and Content." The NRC reviews NPUF initial and renewal license applications according to NUREG-1537, Part 2, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors, Standard Review Plan and Acceptance Criteria."

As a license term nears its end, a licensee must submit an application in order to continue operations. Per 10 CFR 2.109(a), referred to as the "timely renewal provision," if, at least 30 days before the expiration of an existing license, the licensee files an application for a renewal or for a new license for the authorized activity, the existing license will not be deemed to have expired until the application has been finally determined.

B. Environmental Analysis

Part of the license renewal process involves the NRC's environmental analysis of the license renewal action. The National Environmental Policy Act of 1969, as amended (42 USC 4321 *et seq.*) (NEPA), requires all Federal agencies to evaluate the impacts of proposed major actions on the human environment. The NRC complies with NEPA through regulations in 10 CFR part 51, ''Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." The regulations in 10 CFR part 51 implement Section 102(2) of NEPA in a manner that is consistent with the NRC's domestic licensing and related regulatory authority under the AEA, the Energy Reorganization Act of 1974, as amended, and the Uranium Mill

Tailings Radiation Control Act of 1978. This reflects the Commission's announced policy as cited in § 51.10(a) to voluntarily take account of the 1978 Council on Environmental Quality final regulations for implementing NEPA, “National Environmental Policy Act—Regulations,” subject to certain conditions. For various licensing actions specified under 10 CFR part 51, applicants are required to submit environmental documentation in the form of an environmental report, or a supplement to an environmental report, as applicable, as part of license applications. This documentation assists the NRC in performing its independent environmental review of the potential environmental impacts of the licensing action in support of meeting the NRC’s obligations under NEPA and the NRC’s regulations for implementing NEPA under 10 CFR part 51. For all licensing actions, as specified in 10 CFR part 51, the NRC must prepare either an environmental impact statement or an environmental assessment, as appropriate, pursuant to §§ 51.20 or 51.21.

C. Ongoing Oversight Activities

In the period of time between license applications, NPUFs are required under § 50.59(d)(1) and (2) to maintain records of changes in the facility, changes in procedures, and tests and experiments. For changes, experiments, or tests not requiring a license amendment, § 50.59 requires licensees to maintain written evaluations that provide the bases of the determinations that the change, test, or experiment does not require a license amendment. Licensees currently submit a report to the NRC annually summarizing all changes, tests, and experiments, but are not required to submit updated FSARs other than at the time of license renewal.

In addition, the NRC periodically inspects each operating NPUF using a graded approach that prioritizes higher-power facilities. The NRC completes an annual inspection of NPUFs licensed to operate at power levels of 2 megawatts thermal (MWt) or greater. For NPUFs operating under 2 MWt, the NRC completes an inspection once every 2 years.

Inspections can include reviews of organizational structure, reactor operator qualifications, design and design control, radiation and environmental protection, maintenance and surveillance activities, transportation, material control and accounting, operational activities, review and audit functions, experiments, fuel handling, procedural controls, emergency preparedness, and security.

III. Discussion

The NRC is proposing to amend the NRC's regulations that govern the license renewal process for NPUFs. This proposed rulemaking would: 1) create a definition for "non-power production or utilization facility," or "NPUF;" 2) eliminate license terms for facilities, other than testing facilities, licensed under 10 CFR 50.21(a) or (c); 3) define the license renewal process for testing facilities licensed under § 50.21(c) and NPUFs licensed under 10 CFR 50.22; 4) require all NPUF licensees to submit FSAR updates to the NRC every 5 years; 5) amend the current timely renewal provision under 10 CFR 2.109, allowing facilities to continue operating under an existing license past its expiration date if the facility submits a license renewal application at least 2 years (currently 30 days) before the current license expiration date; 6) provide an accident dose criterion of 1 rem (0.01 Sv) TEDE for NPUFs other than testing facilities; 7) extend the applicability of 10 CFR 50.59 to NPUFs regardless of their decommissioning status; 8) clarify an applicant's requirements for meeting the existing provisions of 10 CFR 51.45; and 9) eliminate the requirement to submit financial qualification information with license renewal applications under 10 CFR 50.33(f)(2). This section describes the need for improvements in the current license renewal process and the changes the NRC proposes to make to the license renewal process to address these needs.

A. Need for Improvement in the License Renewal Process

In 2008, the NRC identified a need to identify and implement efficiencies in the NPUF license renewal process to streamline the process while ensuring that adequate protection of public health and safety is maintained. This need for improvement in the reliability and efficiency of the process was primarily driven by four issues:

1. Historic NRC Staffing and Emergent Issues

Non-power production or utilization facilities were some of the first reactors licensed by the Atomic Energy Commission (AEC) and the first reactors to face license renewal. Most of these reactors were initially licensed in the late 1950s and 1960s for terms from 10 to 40 years. The AEC started renewing these licenses in the 1960s. License renewal was primarily an administrative activity until 1976, when the NRC decided to conduct a technical review for license renewal equivalent to initial licensing. The licenses with initial 20-year terms were due for renewal during this timeframe. As the NRC started developing methods for conducting these technical reviews, an accident occurred at the Three Mile Island (TMI) nuclear power plant.

The NRC's focus on post-TMI activities resulted in a suspension of NPUF license renewal activities for several years. After license renewal activities were restarted, the NRC issued a number of renewals in a short period of time primarily by relying on generic evaluations. These were 20-year renewals that expired starting in the late 1990s. Original 40-year licenses also started expiring in the late 1990s. These two groups of renewals coming due in a short period of time created a new surge of license renewal applications.

In response to the security initiatives identified following the terrorist attacks of September 11, 2001, the NRC redirected its staff from processing the license renewal applications that were received in the late 1990s to addressing security items. In addition, the NRC was focused on implementing 10 CFR 50.64 to convert NPUF licensees to the use of low-enriched uranium.

2. Limited Licensee Resources

Many NPUF licensees have limited staff resources available for licensing. The number of NPUF staff available for licensing can range from one part-time employee for some low-power facilities to four or five people for higher-power facilities. The NPUF staff that perform the licensing function typically do so in addition to their normal organizational responsibilities, which often results in delays (particularly in responding to the NRC's requests for additional information (RAI)) in the license renewal process.

3. Inconsistent Existing License Infrastructure

The NPUFs licensed under § 50.21(a) or (c) primarily comprise college and university sites. Staff turnover and limited staffing resources at an NPUF often contribute to a lack of historical knowledge of the development of the licensee's FSAR and changes to the FSAR. During the most recent round of license renewals, the NRC found that some of the submitted FSARs did not adequately reflect the current licensing basis for the respective licensees. Because the only required FSAR submission comes at license renewal, which can be at 20-year or greater intervals, submitted FSARs often contain varying levels of completeness and accuracy. Consequently, the NRC must issue RAIs to obtain missing information, seek clarifications and corrections, and document the current licensing bases.

4. Regulatory Requirements and Broad Scope of the Renewal Process

For power reactors, license renewal reviews have a defined scope, primarily focused on aging management, as described in 10 CFR part 54. For NPUFs, there are no explicit requirements on the scope of issues to be addressed during license renewal. Therefore, the scope of review for license renewal is the same as that for an original license.

In addition, in response to Commission direction in the Staff Requirements Memorandum (SRM) to SECY-91-061, "Separation of Non-Reactor and Non-Power Reactor Licensing Activities from Power Reactor Licensing Activities in 10 CFR Part 50," the NRC developed licensing guidance for the first time since many NPUF applicants were originally licensed. In that guidance (NUREG-1537, Parts 1 and 2), the NRC provides detailed descriptions of the scope, content, and format of FSARs and the NRC's process for reviewing initial license applications and license renewal applications. However, at the time of the first license renewals using NUREG-1537, some license renewal applications had varying levels of consistency with NUREG-1537. These licensees did not propose an acceptable alternative to the guidance.

NRC Response to These Issues

Once a backlog of NPUF license renewal applications developed and persisted, the Commission and other stakeholders voiced concerns not only about the backlog, but also about the burdensome nature of the process itself. The Commission issued SRM-M080317B, "Briefing on State of NRC Technical Programs" in April 2008, which directed the NRC staff to "examine the license renewal process for non-power reactors and identify and implement efficiencies to streamline this process while ensuring that adequate protection of public health and safety are maintained."

In October 2008, the NRC staff provided the Commission with plans to improve the review process for NPUF license renewal applications in SECY-08-0161, "Review of Research and Test Reactor License Renewal Applications." In SECY-08-0161, the NRC staff discussed stakeholder feedback on the current process, including ways it could be improved and the options the NRC staff was considering for improving the review process. The NRC staff provided a detailed description of five options for streamlining the NPUF license renewal process:

- The “alternate safety review approach” would limit the review of license renewal applications to changes to the facility since the previous license review occurred, compliance with the current regulations, and the inspection process.
- The “graded approach” would base the areas of review on the relative risk associated with the facility applying for a renewed license. The graded approach would ensure safe operation by properly identifying the inherent risk associated with the facility and ensuring those risks are minimized.
- The “generic analysis approach” would require the NRC to review and approve a generic reactor design similar to the NRC topical report process. The NRC would rely on the previously approved generic analysis and would not reanalyze those items for each licensee.
- The “generic siting analysis approach” would require the NRC to develop a generic communication that contains information related to each of the licensee sites. The licensees could then reference this generic communication in their license renewal submittals.
- The “extended license term approach” would permit extended or indefinite terms for NPUF licenses. The NRC staff described this approach in SECY-08-0161:

> In order to permit an extended term (including possibly an indefinite term), the NRC staff would have to explain why it is appropriate and, more importantly, demonstrate that there are no aging concerns. Environmental conditions such as temperature, pressure and radiation levels in most [research and test reactors (RTRs)] are not significant. With surveillance, maintenance and repair, RTRs can have indefinite lives. For a facility to be eligible for an extended license term, the NRC staff would complete a detailed renewal with a licensing basis reviewed against NUREG-1537. To maintain the licensing basis over time, the NRC staff would propose a license condition or regulation that requires licensees to revise their SARs on a periodic basis such as every 2 years. The inspection program

would be enhanced to place additional focus on surveillance, maintenance and repair, and changes to the facility made under 10 CFR 50.59. The licensee would still be required to adhere to changes in the regulations.

The Commission issued SRM-SECY-08-0161, "Review of Research and Test Reactor License Renewal Applications," in March 2009, which instructed the NRC staff to proceed with several actions. The Commission directed NRC staff to: 1) immediately implement short-term program initiatives to address the backlog of license renewal applications; 2) work with the regulated community and other stakeholders to develop an interim streamlining process to focus the review on the most safety-significant aspects of the license renewal application; and 3) streamline the review process to ensure that it becomes more efficient and consistent, thereby reducing uncertainties in the process while ensuring compliance with regulatory requirements.

As part of its direction to develop the program initiatives, the Commission instructed the NRC staff to implement a graded approach commensurate with the risk posed by each facility, incorporate elements of the alternate safety review approach, and use risk insights from security assessments to inform the dose threshold. In addition, the Commission told the NRC staff to develop an interim staff guidance (ISG) document that employs the graded approach to streamline the license renewal application process.

Lastly, the Commission instructed the NRC staff to submit a long-term plan for an enhanced NPUF license renewal process. The Commission directed that the plan include development of a basis for redefining the scope of the process as well as a recommendation regarding the need for rulemaking and guidance development.

The NRC staff responded to Commission direction by implementing short-term actions to address the license renewal application backlog and developing the "Interim Staff Guidance on Streamlined Review Process for License Renewal for Research Reactors," hereafter referred to as the ISG. The ISG called for employing a graded approach to streamline the license renewal application process. Since October 2009, the NRC has reviewed license renewal applications

according to the streamlined review process presented in the ISG. The ISG identified the three most safety-significant sections of an FSAR: reactor design and operation, accident analysis, and technical specifications. The NRC also has reviewed the licensees' radiation protection and waste management programs, and compliance with financial requirements. The ISG divided facilities into two groups: 1) those facilities with licensed power of less than 2 MWt, which would undergo a limited review focusing on the safety-significant aspects, considering the decisions and precedents set by past NRC reviews; and 2) those facilities with licensed power of 2 MWt and greater, which would undergo a full review using NUREG-1537, Part 2. The process outlined in the ISG facilitated the NRC's review of license renewal applications and enabled the NRC to review applications in a more timely manner.

In addition, the NRC staff issued SECY-09-0095, "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," in June 2009 to provide the Commission with a long-term plan for enhancing the NPUF license renewal process. In the long-term plan, the NRC staff proposed to develop a draft regulatory basis to support proceeding with rulemaking to streamline and enhance the NPUF license renewal process. The Commission issued SRM-M090811, "Briefing on Research and Test Reactor (RTR) Challenges," in August 2009, which directed NRC staff to accelerate the rulemaking to establish a more efficient, effective, and focused regulatory framework.

In August 2012, the NRC staff completed the "Regulatory Basis to Support Proceeding with Rulemaking to Streamline and Enhance the Research and Test Reactor (RTR) License Renewal Process," hereafter referred to as the regulatory basis.[1]

[1] At the time of publication of the regulatory basis, the rulemaking title was the "Non-Power Reactor (NPR) License Renewal Rulemaking." During the development of the proposed rule, the scope of the rulemaking expanded to include recent license applicants (e.g., medical radioisotope irradiation and processing facilities) that are not reactors. In order to encompass all affected entities, the NRC has changed the title of the rulemaking to the "Non-power Production or Utilization Facility License Renewal Rulemaking."

The regulatory basis analyzed the technical, legal, and policy issues; impacts on public health, safety, and security; impacts on licensees; impacts on the NRC; stakeholder feedback; as well as other considerations, and concluded that a rulemaking was warranted. In developing the regulatory basis for rulemaking, the NRC staff considered lessons learned as a result of implementation of the streamlined review process outlined in the ISG. A public meeting was held on August 7, 2014, to discuss the regulatory basis and rulemaking options. The NRC held another public meeting on October 7, 2015, to afford stakeholders the opportunity to provide feedback and comment on preliminary proposed rule concepts. The participants provided comments and questions to the NRC that focused on the potential impacts of eliminating license terms, the scope of reviews under the new process, and how this new change in regulation would work compared to the current license renewal process. The NRC considered those comments in developing this proposed rule.

B. Proposed Changes

The proposed amendments are intended to enhance the effectiveness and efficiency of the NPUF license renewal process, consistent with the AEA's criterion for imposing minimum regulation on facilities of these types. This proposed rule would:

1. Create a definition for "non-power production or utilization facility," or "NPUF."

The proposed rule would address inconsistencies in definitions and terminology associated with NPUFs in §§ 50.2 and 50.22 and 10 CFR part 170.3, which result in challenges in determining the applicability of the regulations. In an October 2014 direct final rule, "Definition of a Utilization Facility," the NRC amended its regulations to add SHINE Medical Technologies, Inc.'s (SHINE) proposed accelerator-driven subcritical operating assemblies to the NRC's definition of a "utilization facility" in § 50.2. The existing definitions for non-power facilities (e.g., non-power reactor, research reactor, testing facility) do not adequately cover new entities like SHINE or other medical radioisotope irradiation and processing facilities. The NRC

is proposing to add a specific definition for “non-power production or utilization facility” to § 50.2 to establish a term that is flexible enough to capture all non-power facilities licensed under § 50.22 or § 50.21(a) or (c). This action will ensure clarity and consistency for the applicability of the associated regulations for NPUFs. The proposed rule also would make conforming changes in other sections to refer to this new definition.

2. Eliminate license terms for facilities, other than testing facilities, licensed under 10 CFR 50.21(a) or (c).

The AEA does not establish license terms for Section 104a or c facilities. These licenses, however, are subject to § 50.51(a), which states that a license “will be issued for a fixed period of time to be specified in the license but in no case to exceed 40 years from date of issuance.” The NRC currently issues licenses under § 50.21(a) or (c) for a term of 20 years. The NRC intends to reduce the burden on licensees associated with license terms by requiring periodic submittals of updated FSARs instead of periodic license renewal applications.

Currently, license renewal offers both the NRC and the public the opportunity to re-evaluate the licensing basis of the NPUF. The purpose of the license renewal is to assess the likelihood of continued safe operation of the facility to ensure the safe use of radioactive materials for beneficial civilian purposes while protecting people and the environment and ensuring the common defense and security. For several reasons that are unique to NPUFs, the NRC believes that this objective can be achieved through other forms of regulatory oversight. The NRC can continue to protect public health and safety, promote the common defense and security, and protect the environment through regular, existing oversight activities and the proposed addition of requirements for periodic FSAR submittals. This approach also would be consistent with the NRC’s overall program to make licensing more efficient and effective and would implement and reflect lessons learned from decades of processing license renewal applications. The NRC has reached this conclusion based on the following three considerations.

First, NPUFs licensed under § 50.21(a) or (c), other than testing facilities, operate at low power levels, temperatures, and pressures, and have a small inventory of fission products in the fuel, as compared to power reactors, therefore presenting a lower potential radiological risk to the environment and the public. Additionally, the consequences of the maximum hypothetical accidents (MHAs) for these facilities fall below the standards in 10 CFR part 20 for protecting the health and safety of the public.

Twenty-seven[2] of the 31 currently licensed facilities' cores are submerged in a tank or pool of water. These volumes of water, ranging from 5,000 to more than 100,000 gallons, provide a built-in heat sink for decay heat. Twenty-five of these 27 licensed facilities are not required to have emergency core cooling systems (ECCS) because analysis has shown that air cooling is sufficient to remove decay heat if the water was not present. These NPUFs do not have significant decay heat, even after extended maximum licensed power operation, to be a risk for overheating, failure of a fission product barrier, or posing a threat to public health and safety, even under a loss of coolant accident where water levels drop below the core. Additionally, many of the facilities monitor for leaks in the form of routine inspections, track and trend water inventory, and perform surveillances on installed pool level instrumentation and sensors. Licensees perform analyses for radioisotope identification of primary and, if applicable, secondary coolant by sampling the water periodically. Many facilities sample weekly for gross radioactive material content, which is also used to establish trends to quickly identify fuel or heat exchanger failure. Most of these licensees analyze, in their FSARs, pool and heat exchanger failures and the potential consequences for the safety of the reactor, workers, and public. In general, the radioisotope concentrations in pool or tank water at NPUFs are within the

[2] The three Aerojet-General Nucleonics (AGN) reactors (University of New Mexico (Docket No. 50-252), Idaho State University (Docket No. 50-284), and Texas A&M University (Docket No. 50-59)), each rated at 5-watts, and the University of Florida Argonaut reactor (Docket No. 50-83), rated at 100 kilowatts, are not considered tank or pool reactors.

effluent concentration limits specified in Appendix B to 10 CFR part 20, and thus are not radiologically significant.

Only two of the NPUFs licensed under § 50.21(a) or (c), other than the one testing facility, are required by their safety analyses to have an ECCS. For these NPUFs,[3] the ECCS is only needed to direct flow into the top of the tank or pool to provide cooling for a limited period of time after reactor shutdown. This period of time is dependent on the recent operational history of the reactor, which determines the decay heat present at reactor shutdown. After this relatively brief time, air cooling is adequate to remove decay heat even without the ECCS. Additionally, performance of the ECCS is ensured through required surveillance and testing on the system at these facilities. Operation of the facility is not permitted if the ECCS has not been verified operational prior to reactor startup or if the system is deemed non-operational during reactor operation. In the unlikely event that the ECCS is not available after an operational history that would require ECCS, core damage will not occur if the core is uncovered as long as a small amount of cooling flow is directed to the core, which is available from multiple sources.

Second, these facilities' simple design and operation yield a limited scope of aging-related concerns. The NRC has found no significant aging issues that need evaluation at the time of license renewal because the NRC currently imposes aging-related surveillance requirements on NPUFs via technical specifications, as needed. Aging related issues are specifically addressed in the standard review plan and acceptance criteria used for evaluating license renewal applications (i.e., NUREG-1537, Part 2). Parts 1 and 2 of NUREG-1537 document lessons learned and known aging issues from prior reviews. Since NUREG-1537 was published in 1996, NRC reviews and assessments have not revealed any additional issues or need to update the NUREG. Specifically, based on operating experience over the past 60 years and review of license renewal applications over the past 40 years, and as documented in

[3] The two facilities are Massachusetts Institute of Technology (MIT) (Docket No. 50-20) and the University of California-Davis (Docket No. 50-607).

NUREG-1537, Parts 1 and 2, the NRC has determined that for NPUFs, there are two main areas related to aging that need surveillance because of potential safety concerns: 1) fuel cladding and 2) instrumentation and control features.

With regard to fuel cladding, the NRC currently requires NPUFs to perform periodic fuel inspections. Through years of operational experience, the NRC has found that fuel failures either do not occur or do not release significant amounts of fission products and are quickly detected by existing monitoring systems and surveillances. If fuel failures are detected, licensees are able to take the facility out of service without delay and remove any failed assemblies from service.

With regard to instrumentation and control, the NRC has found that failures in this area result in automatic facility shutdown. Failures reveal themselves to the licensee and do not prevent safe shutdown. Over the past 60 years of operation of these facilities, the potential occurrence of age-related degradation has been successfully mitigated through inspection, surveillance, monitoring, trending, recordkeeping, replacement, and refurbishment. In addition, licensees are required to report preventive and corrective maintenance activities in their annual reports, which are reviewed by the NRC. This allows the NRC to identify new aging issues if they occur. Therefore, the NRC has concluded that existing requirements and facility design and operational features would address concerns over aging-related issues during a non-expiring license term.

Third, the design bases of these facilities evolve slowly over time. The NRC receives approximately five license amendment requests from all NPUF licensees combined each year. Further, on average, each of these licensees reports only five § 50.59 evaluations per year for changes to its facility that do not require prior NRC approval. Lastly, changes to regulations that would impact the licensing bases of power reactor facility operations rarely apply to NPUFs.

Given these technical considerations, the elimination of license terms for NPUFs licensed under § 50.21(a) or (c), other than testing facilities, combined with the proposed

addition of requirements for periodic FSAR submittals, should have a positive effect on safety. Ending license renewal for these licensees would allow agency resources to be shifted to enhance oversight of these facilities through increased interactions with licensees related to ongoing oversight activities, such as conducting routine inspection activities and reviewing annual reports and updated FSARs. The NRC would enhance ongoing safe operations of licensed facilities, regardless of license duration, by requiring facilities to submit FSAR updates every 5 years (see discussion on proposed § 50.71(e) in Section III.B.4, "Require all NPUF licensees to submit FSAR updates to the NRC every 5 years," of this document). Recurring FSAR reviews by the NRC would provide for maintenance of the facility's licensing basis and provide reasonable assurance that a facility will continue to operate without undue risk to public health and safety or to the environment and without compromising the facility's security posture. Should the NRC identify potential issues with the facility's continued safe operation in its reviews of FSAR updates, the Commission can undertake regulatory actions specified in § 2.202 to modify, suspend, or revoke a license. In addition, the public would remain informed about facility operations through the publicly available FSAR submittals and would continue to have opportunities for participation through licensing actions and the § 2.206 petition process. By eliminating license terms and replacing them with required periodic FSAR update submittals coupled with existing oversight processes, the NRC would reduce the burden on facilities licensed under § 50.21(a) or (c), other than testing facilities, which is consistent with the AEA and supports the NRC's efforts to make licensing more efficient and effective.

As described in Section V, "Section-by-Section Analysis," of this document, the proposed rule language does not specifically address the timing of initial FSAR updates for existing NPUF licensees. The NRC intends to issue orders following the publication of the final rule to define how the proposed revisions would impact current licensees. The NRC considered incorporating these requirements into its regulations but determined that orders would be a more efficient and effective approach. This is because: 1) invoking the initial FSAR submittal

requirements for currently operating NPUFs would be a one-time requirement that would result in obsolete rule text after implementation; 2) a regulatory requirement would have compelled licensees to request and NRC to issue a license amendment to remove existing license terms; and 3) to facilitate licensee and NRC workload management, the initial FSAR submittals need to be staggered, and issuing orders allows the agency to assign licensees an appropriate implementation schedule to achieve this goal.

Specifically, the orders would remove license terms from each license as of the effective date of the final rule. The facilities would be grouped by whether they have undergone license renewal using NUREG-1537, Part 2 and the ISG. In addition, the orders would dictate when the licensee's initial FSAR update would be due to the NRC. The NRC would issue these orders for the purposes of staggering initial and ongoing FSAR updates. For that purpose, licensees would be placed in three groups based on the following:

1) Group 1 licensees would each be required to submit an updated FSAR 1 year following the effective date of the final rule. This group would consist of licensees that completed the license renewal process using the ISG. The NRC would require these licensees to submit an updated FSAR first because, with a recent license renewal, the FSARs should require minimal updates.

2) Group 2 licensees would each be required to submit an updated FSAR 2 years following the effective date of the final rule. This group would consist of licenses that last completed license renewal prior to the issuance of the ISG (i.e., license renewal was reviewed per NUREG-1537, Part 2). The NRC would allow these licensees more time to submit an updated FSAR than Group 1 licensees because more time has passed since Group 2's most recent license renewals, so additional time may be needed to update their FSARs.

3) Group 3 would consist of the remaining NPUF licensees, each of which would need to submit a license renewal application consistent with the format and content guidance in NUREG-1537, Part 1. The NRC would review the application using NUREG-1537, Part 2, and

the ISG, as appropriate. If the NRC were to conclude that a licensee meets the standard for issuing a renewed license, then the licensee would receive a non-expiring renewed license.

The proposed rule also would make conforming changes to requirements for facilities that are decommissioning by revising § 50.82(b) and (c). These provisions address license termination applications and collection periods for shortfalls in decommissioning funding for NPUFs. The proposed rule would clarify that NPUFs licensed under § 50.22 and testing facilities licensed under § 50.21(c) are the only NPUFs with license terms, which the NRC uses to determine when an application for license termination is needed. The NPUFs licensed under § 50.21(a) or (c) would need to submit an application for license termination within 2 years following permanent cessation of operations, as is currently required.

3. Define the license renewal process for testing facilities and NPUFs licensed under 10 CFR 50.22.

For NPUF licenses issued under § 50.22 and testing facilities licensed under § 50.21(c), the NRC proposes a set of regulations explicitly defining the license renewal process in proposed § 50.135 that would consolidate in one section existing regulatory requirements (i.e., requirements regarding written communications, application filing, application contents, and the issuance of renewed licenses) for current and future licensees. The proposed rule would not impose new regulations on these facilities. The NRC also would make a conforming change to § 50.8 to reflect the approved information collection requirement of proposed § 50.135.

Section 103 of the AEA establishes a license term of no more than 40 years for § 50.22 facilities. Although the AEA does not establish a fixed license term for testing facilities, these facilities are currently subject to additional license renewal requirements (e.g., siting subject to 10 CFR part 100, Advisory Committee on Reactor Safeguards [ACRS] review and environmental impact statements) due to higher power levels or other safety-significant design features as compared to other class 104a or c licensees. Therefore, the NRC is proposing that

licensees under § 50.22 and testing facilities licensed under § 50.21(c) would continue to prepare a complete license renewal application.

The NRC is proposing to make renewed operating licenses for these facilities effective 30 days after the date of issuance, replacing the previous operating license. The 30 days is intended to allow the facility to make any necessary and conforming changes to the facility processes and procedures to the extent that they are required by the applicable conditions of the renewed license. If administrative or judicial appeal affects the renewed license, then the previous operating license would be reinstated unless its term has expired and the facility has failed to submit a license renewal application in a timely manner according to proposed § 50.135(c)(2).

4. Require all NPUF licensees to submit FSAR updates to the NRC every 5 years.

Under the current license renewal process, the NRC found that licensees were not always able to provide documentation describing the details of their licensing basis, including their design basis calculations, in license renewal applications. Some licensees had difficulty documenting the necessary updates to licensing bases when they were called upon to do so between initial licensing and license renewal. Consequently, the license renewal application review process was overly burdensome for both licensees and the NRC because the NRC had incomplete information regarding changes to design and operational characteristics of the facility. From a safety perspective, an updated FSAR is important for the NRC's inspection program and for effective licensee operator training and examination.

The proposed rule would require all NPUF licensees to submit FSAR updates to the NRC every 5 years. By requiring periodic submittals of FSAR updates, the NRC anticipates that licensees will document changes in licensing bases as they occur, which would maintain the continuity of knowledge both for the licensee and the NRC and the understanding of changes and effects of changes on the facility. The NRC anticipates that these changes would result in minimal additional burden on licensees and the NRC, largely because licensees are currently

required by § 50.59 to keep FSARs up to date. The proposed rule would impose a new requirement for licensees to submit an updated FSAR to the NRC according to proposed § 50.71(e).

The proposed rule also would correct an existing grammatical error in footnote 1 to § 50.71(e). Currently the footnote states, “Effects of changes includes appropriate revisions of descriptions in the FSAR such that the FSAR (as updated) is complete and accurate.” The proposed rule would change “includes” to “include” so that the plural subject is followed by a plural verb.

5. Amend the current timely renewal provision under 10 CFR 2.109, allowing facilities to continue operating under an existing license past its expiration date if the facility submits a license renewal application at least 2 years before the current license expiration date.

The requirements in § 2.101(a) allow the NRC to determine the acceptability of an application for review by the NRC. However, the current provision in § 2.109 allows an NPUF licensee to submit its license renewal application as late as 30 days before the expiration of the existing license. Historical precedent indicates that 30 days is not a sufficient period of time for the NRC to adequately assess the sufficiency of a license renewal application for review. As a result, the NRC has accepted license renewal applications and addressed their deficiencies through the license renewal process, largely through submitting RAIs to the licensee to supplement the application. This approach increases the burden of the license renewal process on both licensees and the NRC.

To address this issue, the NRC is proposing revisions to the timely renewal provision for NPUFs licensed under § 50.22 and testing facilities licensed under § 50.21(c) to establish a length of time adequate for the NRC to review the sufficiency of a license renewal application. Specifically, revisions to § 2.109 would amend the current timely renewal provision, allowing NPUFs licensed under § 50.22 and testing facilities licensed under § 50.21(c) to continue operating under an existing license past its expiration date if the facility submits a sufficient

license renewal application at least 2 years before the current license expiration date. In such cases, the existing license would not be deemed to have expired until the application has been finally determined by the NRC, as indicated in § 2.109. The proposed revision would ensure that the NRC has adequate time to review the sufficiency of license renewal applications while the facility continues to operate under the terms of its current license. The NRC also is proposing to eliminate this provision for facilities, other than testing facilities, licensed under § 50.21(a) or (c), as these facilities will no longer have license expiration dates.

6. Provide an accident dose criterion of 1 rem (0.01 Sv) TEDE for NPUFs other than testing facilities.

The standards in 10 CFR part 20 for protection against ionizing radiation provide a limit on the maximum yearly radiation dose a member of the public can receive from the operation of any NRC-licensed facility. Licensees are required to maintain programs and facility design features to ensure that these limits are met. In addition to the dose limits in 10 CFR part 20, accident dose criteria are also applied to determine the acceptability of the licensed facility. The accident dose criteria are not dose limits; they inform a licensee's accident analyses and the development of successive safety measures (i.e., defense-in-depth) so that in the unlikely event of an accident, no acute radiation-related harm will result to any member of the public. Currently, the accident dose criterion for NPUFs other than testing facilities is the 10 CFR part 20 dose limit to a member of the public. For testing facilities, accident dose criteria are found in 10 CFR part 100.

Since January 1, 1994, for NPUF licensees (other than testing facilities) applying for initial or renewed licensees, the NRC applies the accident dose criterion by comparing the results from the initial or renewed license applicant's accident analyses with the standards in 10 CFR part 20. Prior to that date, the NRC had generally found acceptable accident doses that were less than 0.5 rem (0.005 Sv) whole body and 3 rem (0.03 Sv) thyroid for members of the

public. On January 1, 1994, the NRC amended 10 CFR part 20 to lower the dose limit to a member of the public to 0.1 rem (0.001 Sv) TEDE.

The NRC has determined that the public dose limit of 0.1 rem (0.001 Sv) TEDE is unduly restrictive to be applied as accident dose criteria for NPUFs, other than those NPUFs subject to 10 CFR part 100.[4] However, the NRC considers the accident dose criteria in 10 CFR part 100 (25 rem whole body and 300 rem to the thyroid) applicable to accident consequences for power reactors, which have greater potential consequences resulting from an accident, to be too high for NPUFs other than testing facilities. For these reasons, the NRC is proposing to amend its regulations in § 50.34 to add an accident dose criterion of 1 rem (0.01 Sv) TEDE for NPUFs not subject to 10 CFR part 100.

The accident dose criterion of 1 rem (0.01 Sv) TEDE is based on the Environmental Protection Agency's (EPA) Protection Action Guides (PAGs), which were published in EPA 400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents." The EPA PAGs are dose guidelines to support decisions that trigger protective actions such as staying indoors or evacuating to protect the public during a radiological incident. The PAG is defined as the projected dose to an individual from a release of radioactive material at which a specific protective action to reduce or avoid that dose is recommended. Three principles considered in the development of the EPA PAGs include: 1) prevent acute effects; 2) balance protection with other important factors and ensure that actions result in more benefit than harm; and 3) reduce risk of chronic effects. In the early phase (i.e., the beginning of the nuclear incident, which may last hours to days), the EPA PAG that recommends the protective action of sheltering-in-place or evacuation of the public to avoid inhalation of gases or particulates in an atmospheric plume and to minimize external radiation

[4] The NRC Atomic Safety and Licensing Appeal Board stated that the standards in 10 CFR part 20 are unduly restrictive as accident dose criteria for research reactors (Trustees of Columbia University in the City of New York, ALAB-50, 4 AEC 849, 854-855 (May 18, 1972)).

exposures, is 1 rem (0.01 Sv) to 5 rem (0.05 Sv). So, if the projected dose to an individual from an incident is less than 1 rem (0.01 Sv), then no protective action for the public is recommended. In light of this understanding of the early phase EPA PAG, the NRC's proposed accident dose criterion of 1 rem (0.01 Sv) TEDE for NPUFs, other than testing facilities would provide reasonable assurance of adequate protection of the public from unnecessary exposure to radiation.

7. Extend the applicability of 10 CFR 50.59 to NPUFs regardless of their decommissioning status.

Section 50.59(b) of the Commission's regulations does not apply § 50.59 to NPUFs whose licenses have been amended to reflect permanent cessation of operations and that no longer have fuel on site (e.g., they have returned all of their fuel to the U.S. Department of Energy [DOE]). The current language states that § 50.59 is applicable to licensees "whose license has been amended to allow possession of nuclear fuel, but not operation of the facility." Therefore, § 50.59 is no longer applicable to NPUF licensees that no longer possess nuclear fuel. For these licensees, the NRC adds license conditions identical to those of § 50.59 to allow the licensee to make changes in its facility or changes in its procedures that would not otherwise require obtaining a license amendment pursuant to § 50.90. Because most NPUFs promptly return their fuel to the DOE after permanent shutdown, in contrast to decommissioning power reactors, these licensees must request the addition of the license conditions. This imposes an administrative burden on the licensees and the NRC. This burden would be eliminated with the proposed regulatory change to revise the wording of § 50.59(b) to extend the applicability of § 50.59 to NPUFs regardless of their decommissioning status.

8. Clarify an applicant's requirements for meeting the existing provisions of 10 CFR 51.45.

The NRC is required to prepare either an environmental impact statement or environmental assessment, as appropriate, for all licensing actions pursuant to 10 CFR part 51.

For most types of licenses, 10 CFR part 51 specifies that an applicant must submit environmental documentation in the form of an environmental report, or a supplement to a previously submitted environmental report, to assist the NRC's review. However, the NRC does not currently have explicit requirements under 10 CFR part 51 with respect to the nature of the environmental documentation that must accompany applications for initial licenses and renewed licenses for NPUFs. This fact was recently highlighted in association with the NRC's review of a construction permit application for a new NPUF to be licensed under the authority of Section 103 of the AEA.

The proposed rule would add a new section to 10 CFR part 51 to clarify NPUF environmental reporting requirements. Proposed § 51.56 would clarify an applicant's existing requirements for meeting the provisions of § 51.45. This change would improve consistency throughout 10 CFR part 51 with respect to environmental report submissions required from applicants for licensing actions. The NRC also would make a conforming change to 10 CFR 51.17 to reflect the approved information collection requirement of proposed 10 CFR 51.56.

9. Eliminate the requirement for NPUFs to submit financial qualification information with license renewal applications under 10 CFR 50.33(f)(2).

The proposed rule would eliminate license renewal financial qualification requirements for NPUFs. Currently, § 50.33(f) requires NPUF license applicants to provide information sufficient to demonstrate their financial qualifications to carry out the activities for which the license is sought. Because the regulatory requirements for the content of an application for a renewed NPUF license are the same as those for an original license, NPUF licensees requesting license renewal must submit the same financial information that is required in an application for an initial license. In addition, the NRC has found that the financial qualification information does not have a significant impact on the NRC's determination on the license renewal application. The elimination of NPUF license renewal financial qualification requirements reduces the burden associated with license renewal applications while still

enabling the NRC to obtain the information necessary to conduct its review of license renewal applications.

Similar to the current proposal for NPUFs, the 2004 rulemaking, "Financial Information Requirements for Applications to Renew or Extend the Term of an Operating License for a Power Reactor," discontinued financial qualification reviews for power reactors at the license renewal stage except in very limited circumstances. The Commission stated that "[t]he NRC believes that its primary tool for evaluating and ensuring safe operations at nuclear power reactors is through its inspection and enforcement programs… ." Further, the Commission stated that "[t]he NRC has not found a consistent correlation between licensees' poor financial health and poor safety performance. If a licensee postpones inspections and repairs that are subject to NRC oversight, the NRC has the authority to shut down the reactor or take other appropriate action if there is a safety issue."

At NPUF sites, the NRC's inspection and enforcement programs serve as important tools for evaluating licensee performance and ensuring safe operations. The NRC performs routine NPUF program inspections and special and reactive inspections. In addition, the NRC manages the NPUF operator license examination program. The NRC also manages the review of NPUF emergency and security plans and develops and implements policy and guidance concerning the NPUF licensing program. These programs provide, in part, the NRC's safety oversight of these licensees.

The elimination of financial qualification requirements for power reactor licensees at the time of license renewal supports the NRC's basis for eliminating NPUF financial qualification requirements at the time of license renewal. The NRC is not aware of any connection between an NPUF's financial qualifications at license renewal and safe operation of the facility. Moreover, because NPUFs have significantly smaller fission product inventory and potential for radiological consequences than do power reactors, the NPUF financial qualification reviews appear to be of less value in ensuring safety than reviews previously required of power reactors.

IV. Specific Requests for Comments

The NRC is seeking public comment on the proposed rule. We are particularly interested in comments and supporting rationale from the public on the following:

- As discussed in Section III, "Discussion," of this document, the NRC is proposing that license terms for NPUFs, other than testing facilities, licensed under 10 CFR 50.21(a) or (c) would be removed from existing licenses via order. Are there any unintended consequences associated with removing license terms in this manner? Provide the basis for your answer.
- Proposed § 50.71 would require all NPUFs to submit an update to the FSAR originally submitted with the facility's license application every 5 years. The NRC staff plans to specify the first submittal date in orders issued to each facility. Should the NRC specify the date by which each facility or category of facility must submit its first updated FSAR in the rule language instead of using site-specific orders? Are there any unintended consequences of establishing the first submittal dates through orders? Please provide the basis for your answer.
- Proposed § 50.135 outlines the license renewal process for facilities licensed under § 50.22 and testing facilities licensed under § 50.21(c). Should any elements of the process be removed from or added to the NRC proposal? Please provide specific examples.
- The NPUFs licensed under § 50.22 are those facilities that are used for industrial or commercial purposes. For example, a facility used primarily for the production and sale of radioisotopes other than for use in research and development would be considered a commercial production or utilization facility and therefore would be licensed under § 50.22. Currently, license applications for such NPUFs pass through additional steps in the licensing process (e.g., mandatory public hearings). These additional steps are required even though many such facilities have the same inherent low risk profile as low-power NPUFs licensed under

§ 50.21(a) or (c) which are not required to proceed through these additional steps. Are these additional steps necessary for all NPUFs licensed under § 50.22, or would it be more efficient and effective to differentiate low-power NPUFs licensed under § 50.22 from high-power NPUFs licensed under § 50.22? Elaborate on requirements that could be tailored for low-power, low-risk NPUFs licensed under § 50.22, including recommended criteria (e.g., power level or other measure) for establishing reduced requirements.

- As discussed in Section III, "Discussion," of this document, the NRC is proposing that license terms would not expire for NPUFs, other than testing facilities, licensed under § 50.21(a) or (c), whereas testing facilities would continue to have fixed license terms that would require periodic license renewal. While the AEA does not establish a fixed license term for testing facilities, these facilities are currently subject to additional regulatory requirements due to higher power levels (e.g., mandatory public hearings, ACRS review, and preparation of environmental impact statements). Is a fixed license term necessary for testing facilities licensed under § 50.21(c) or would it be more efficient and effective to also grant testing facilities non-expiring licenses? Provide the basis for revising NRC requirements to account for the higher risk of testing facilities licensed under § 50.21(c) relative to other NPUFs licensed under § 50.21(a) or (c), including recommended criteria for establishing eligibility for a non-expiring license.

- For NPUFs licensed under § 50.22 and testing facilities licensed under § 50.21(c), does the revision to the timely renewal provision from 30 days to 2 years provide an undue burden on licensees? If so, in addition to your response, please provide information supporting an alternate provision for timely renewal.

- The NRC is considering requiring each NPUF licensee, other than testing facilities, to demonstrate in its accident analysis that an individual located in the unrestricted area following the onset of a postulated accidental release of licensed material, including consideration of experiments, would not receive a dose in excess of 1 rem (0.01 Sv) TEDE for the duration of the

accident. Is the accident dose criterion 1 rem (0.01 Sv) TEDE in proposed § 50.34(a)(1)(ii)(D)(2) appropriate for NPUFs, other than testing facilities? If not, what accident dose criterion is appropriate? Please provide the basis for your answer.

V. Section-by-Section Analysis

The following paragraphs describe the specific changes proposed by this rulemaking.

Proposed § 2.109 Effect of Timely Renewal Application

The NRC is proposing to revise 10 CFR 2.109(a) to exclude NPUFs from the 30-day timely renewal provision because 30 days does not provide the NRC with adequate time to assess license renewal applications.

In addition to this exception from the 30-day timely renewal provision, the NRC is proposing to add a new subparagraph defining a new timely renewal provision for NPUFs with license terms (i.e., facilities licensed under 10 CFR 50.22 and testing facilities licensed under § 50.21(c)). The NRC is proposing to add paragraph (e) to § 2.109 to require an NPUF with a license term to submit a license renewal application at least 2 years prior to license expiration. This will permit adequate time for the NRC to determine the acceptability of the application before expiration of the license term.

Proposed § 50.2 Definitions

The proposed rule would add a definition to § 50.2 for a “non-power production or utilization facility,” or “NPUF.” An NPUF would be defined as a non-power reactor, testing facility, or other production or utilization facility, licensed under the authority of Section 103, Section 104a, or Section 104c of the AEA that is not a nuclear power reactor or fuel reprocessing plant.

Proposed § 50.8 Information Collection Requirements: OMB Approval

The NRC is proposing to revise § 50.8(b) to include proposed § 50.135 as an approved information collection requirement in 10 CFR part 50. This is a conforming change to existing regulations to account for the new information collection requirement.

Proposed § 50.33 Contents of Applications; General Information

The NRC is proposing to revise § 50.33(f)(2) to remove the requirement for NPUFs to submit with license renewal applications the same financial information that is required for initial license applications. These NPUFs (i.e., facilities licensed under § 50.22 and testing facilities) would not be required to submit any financial information with license renewal applications.

Proposed § 50.34 Contents of Applications; Technical Information

The NRC is proposing to revise § 50.34(a)(1)(ii)(D) to clarify the section's applicability to NPUFs licensed under § 50.22 or § 50.21(a) or (c). Paragraph (a)(1)(ii)(D) would be modified to create § 50.34(a)(1)(ii)(D)(1) and (2) to clearly distinguish these requirements between applicants for power reactor construction permits and applicants for NPUF construction permits. Section 50.34(a)(1)(ii)(D)(1) would describe the requirements applicable to power reactor construction permit applicants. The proposed rule would not change the existing requirements for these applicants.

Proposed § 50.34(a)(1)(ii)(D)(2) would specify an accident dose criterion for NPUFs, other than testing facilities subject to 10 CFR part 100. The proposed regulation would set an accident dose criterion of 1 rem (0.01 Sv) TEDE for NPUFs other than testing facilities.

Proposed § 50.51 Continuation of License

The NRC is proposing to revise § 50.51(a) to exempt from license terms NPUFs, other than testing facilities, licensed under § 50.21(a) or (c). Testing facilities and NPUFs licensed under § 50.22 would continue to have fixed license terms and undergo license renewal as described in proposed § 50.135. The NRC is proposing to add § 50.51(c) to clarify that NPUFs, other than testing facilities, licensed under § 50.21(a) or (c) after the effective date of the final rule, would have non-expiring license terms. The implementing change to applicable existing NPUF licensees would be instituted by order to remove license terms.

Proposed § 50.59 Changes, Tests and Experiments

The NRC is proposing to revise paragraph (b) of § 50.59 to extend the section's applicability to NPUFs that have permanently ceased operations and that no longer have fuel on site (e.g., have returned all of their fuel to the DOE).

Proposed § 50.71 Maintenance of Records, Making of Reports

The NRC is proposing to revise paragraph (e) of § 50.71 to require NPUFs to submit an update to the FSAR originally submitted with the facility's license application, as is currently required for nuclear power reactor licensees and applicants for a combined license under 10 CFR part 52. Updates should reflect the changes and effects of changes to the facility's design basis and licensing basis, including any information documented in annual reports, § 50.59 evaluations, license amendments, and other submittals to the NRC since the previous FSAR update submittal. The NRC also is proposing to revise footnote 1 in paragraph (e) of § 50.71 to change the word "includes" to "include" to correct an existing grammatical error.

In addition to extending the applicability of the requirements specified in § 50.71(e), the proposed rule would establish supporting requirements in § 50.71(e)(3) and (e)(4). The NRC is proposing to revise paragraph (e)(3)(i) of § 50.71 to make explicit the applicability of the FSAR

requirements therein to only power reactor licensees. This change would not modify the underlying requirements in § 50.71 that currently apply to power reactor licensees.

The NRC also would add § 50.71(e)(3)(iv) to set forth FSAR requirements similar to those in proposed § 50.71(e)(3)(i) specifically for NPUFs. The NRC is proposing to require NPUFs licensed after the effective date of the final rule to submit initial FSAR revisions within 5 years of the date of issuance of the operating license. Each revision would reflect all changes made to the FSAR up to a maximum of 6 months prior to the date of filing the revision.

The NRC is proposing to restructure and revise paragraph (e)(4) of § 50.71. New paragraph (e)(4)(i) would make explicit that the FSAR update requirements therein apply to nuclear power reactor licensees only. This administrative change would not modify the underlying requirements of existing § 50.71(e)(4) that currently apply to power reactor licensees. In addition, the NRC would add § 50.71(e)(4)(ii) to establish similar FSAR update requirements for NPUFs. Specifically, the NRC is proposing to require NPUF licensees to file subsequent FSAR updates at intervals not to exceed 5 years. Each update must reflect all changes made to the FSAR up to a maximum of 6 months prior to the date of filing the update. The orders described under Section III.B, "Proposed Changes," of this document would also establish the requirement for currently licensed NPUFs to submit recurring FSAR updates on a 5-year periodicity.

Proposed § 50.82 Termination of License

The NRC is proposing to revise paragraph (b) of § 50.82 to replace the term "non-power reactor licensees" with "non-power production or utilization facility licensees" in order to ensure that all NPUFs are subject to the relevant termination and decommissioning regulations.

The NRC is proposing to revise paragraph (b)(1) of § 50.82 to clarify that only NPUFs holding a license issued under § 50.22 and testing facilities licensed under § 50.21(c) would need to submit an application for license termination.

The NRC is proposing to revise paragraph (c) of § 50.82 to clarify when the collection period for shortfalls in funding would be determined. Currently, § 50.82(c) refers to a facility ceasing operation before the expiration of its license. Under the proposed rule, licenses for NPUFs, other than testing facilities, licensed under § 50.21(a) or (c) would not expire. Therefore, for NPUFs, other than testing facilities, licensed under § 50.21(a) or (c), the NRC proposes to revise § 50.82(c) to remove references to the expiration of the license. The requirements for all other licensees (i.e., the holders of a license issued under § 50.22 – including power reactor licenses – and testing facilities) have been renumbered, but the underlying requirements remain unchanged.

Proposed § 50.135 License Renewal for Non-Power Production or Utilization Facilities Licensed Under § 50.22 and Testing Facility Licensees

The NRC is proposing to add § 50.135 to 10 CFR part 50 to clearly define the license renewal process for NPUFs licensed under § 50.22 and testing facilities licensed under § 50.21(c). This section would consolidate existing regulatory requirements related to the NPUF license renewal process in one section and would not modify the underlying requirements that currently apply to NPUFs seeking license renewal.

Proposed § 50.135(a) would specify the section's applicability to NPUFs licensed under § 50.22 and testing facilities licensed under § 50.21(c).

Proposed § 50.135(b) would require that all applications, correspondence, reports, and other written communications be filed in accordance with § 50.4.

Proposed § 50.135(c)(1) would require license renewal applications be prepared in accordance with subpart A of 10 CFR part 2 and all applicable sections of 10 CFR part 50. Proposed § 50.135(c)(2) would allow licensees to submit applications for license renewal up to 10 years before the expiration of the current operating license.

Proposed § 50.135(d)(1) would require licensees to provide the information specified in §§ 50.33, 50.34, and 50.36, as applicable, in license renewal applications. Proposed § 50.135(d)(2) would require applications to include conforming changes to the standard indemnity agreement under 10 CFR part 140. Proposed § 50.135(d)(3) would require licensees to submit a supplement to the environmental report with the license renewal application, consistent with the requirements of proposed § 51.56.

Proposed § 50.135(e) would specify the terms of renewed operating licenses. Proposed paragraph (e)(1) would require that the renewed license would be for the same facility class as the previous license. Proposed paragraph (e)(2) would establish the terms of a renewed license. Renewed licenses would be issued for a fixed period of time, which would be the sum of the remaining amount of time on the current operating license plus the additional amount of time beyond the current operating license expiration (not to exceed 30 years) that the licensee requests in its renewal application. Terms would not exceed 40 years in total. Proposed paragraph (e)(3) would make a renewed license effective 30 days after the date of issuance, replacing the previous operating license. Proposed paragraph (e)(4) would specify that a renewed license may be subsequently renewed following the requirements in § 50.135 and elsewhere in 10 CFR part 50.

Proposed § 51.17 Information Collection Requirements; OMB Approval

The NRC is proposing to revise § 51.17(b) to include proposed § 51.56 as an approved information collection requirement in 10 CFR part 51. This is a conforming change to existing regulations to account for the new information collection requirement.

Proposed § 51.45 Environmental Report

The NRC is proposing to revise § 51.45(a) to add a cross reference to proposed new § 51.56. This is a conforming change to existing regulations to clarify the environmental report requirements for NPUFs.

Proposed § 51.56 Environmental Report – Non-Power Production or Utilization Facility Licenses

The NRC is proposing to add a new section, § 51.56, to clarify existing requirements for the submittal and content of environmental reports by applicants seeking a permit to construct, or a license to operate, an NPUF, or to renew an existing license as otherwise prescribed by § 50.135 of this proposed rule. This section would clarify existing regulatory requirements related to environmental reports and would not modify the underlying requirements that currently apply to NPUFs.

VI. Regulatory Flexibility Certification

As required by the Regulatory Flexibility Act (5 U.S.C. 605(b)), the Commission certifies that this rule will not, if adopted, have a significant economic impact on a substantial number of small entities. This proposed rule affects only the licensing and operation of NPUFs. The companies, universities, and government agencies that own and operate these facilities do not fall within the scope of the definition of “small entities” set forth in the Regulatory Flexibility Act or the size standards established by the NRC (10 CFR 2.810).

VII. Regulatory Analysis

The NRC has prepared a draft regulatory analysis on this proposed regulation and the draft implementing guidance. The analysis examines the costs and benefits of the alternatives considered by the NRC. The NRC requests public comment on the draft regulatory analysis.

The draft regulatory analysis is available as indicated in Section XVI, "Availability of Documents," of this document. Comments on the draft regulatory analysis may be submitted to the NRC as indicated under the ADDRESSES caption of this document.

VIII. Backfitting

The NRC's backfitting provisions for reactors are found in 10 CFR 50.109. The regulatory basis for § 50.109 was expressed solely in terms of nuclear power reactors. For example, the NRC's Advanced Notice of Proposed Rulemaking, Policy Statement, Proposed Rule, and Final Rule for § 50.109 each had the same title: "Revision of Backfitting Process for Power Reactors." As a result, the NRC has not applied § 50.109 to research reactors, testing facilities, and other non-power facilities licensed under 10 CFR part 50 (e.g., "Final Rule; Limiting the Use of Highly Enriched Uranium in Domestically Licensed Research and Test Reactors"; "Final Rule; Clarification of Physical Protection Requirements at Fixed Sites"). In a 2012 final rule concerning non-power reactors, the NRC stated, "The NRC has determined that the backfit provisions in § 50.109 do not apply to test, research, or training reactors because the rulemaking record for § 50.109 indicates that the Commission intended to apply this provision to only power reactors, and NRC practice has been consistent with this rulemaking record" ("Final Rule; Requirements for Fingerprint-Based Criminal History Records Checks for Individuals Seeking Unescorted Access to Non-Power Reactors").

Under proposed § 50.2, "NPUFs" would include non-power reactors, testing facilities, or other non-power production or utilization facilities licensed in accordance with §§ 50.21(a) or (c) (Section 104a or c of the AEA) or § 50.22 (Section 103 of the AEA). Because the term "NPUFs" would include licensees that are excluded from the scope of § 50.109, NPUFs would not fall within the scope of § 50.109. Because § 50.109 does not apply to NPUFs, and this proposed rule would apply exclusively to NPUFs, the NRC did not apply § 50.109 to this proposed rule.

Although NPUF licensees are not protected by § 50.109, for those NPUFs licensed under the authority of Section 104 of the AEA, the Commission is directed to impose the minimum amount of regulation on the licensee consistent with its obligations under the AEA to promote the common defense and security, protect the health and safety of the public, and permit the conduct of widespread and diverse research and development and the widest amount of effective medical therapy possible.

IX. Cumulative Effects of Regulation

The NRC is following its Cumulative Effects of Regulation (CER) process by engaging extensively with external stakeholders throughout this rulemaking and related regulatory activities. Public involvement has included: 1) a request for comment on a preliminary draft regulatory basis document on June 29, 2012, and 2) three public meetings (held on September 13, 2011; December 19, 2011; and March 27, 2012) that supported the development of the draft regulatory basis document. During the development of the proposed rule language, the NRC held two public meetings with stakeholders on August 7, 2014 and October 7, 2015 and will be issuing the draft implementing guidance with the proposed rule to support more informed external stakeholder feedback. Section XIV, "Availability of Guidance," of this document describes how the public can access the draft implementing guidance for which the NRC seeks external stakeholder feedback.

Finally, the NRC is requesting CER feedback on the following questions:

1. In light of any current or projected CER challenges, does the proposed rule's effective date provide sufficient time to implement the new proposed requirements, including changes to programs, procedures, and facilities?

2. If CER challenges currently exist or are expected, what should be done to address them? For example, if more time is required for implementation of the new requirements, what period of time is sufficient?

3. Do other (NRC or other agency) regulatory actions (e.g., orders, generic communications, license amendment requests, inspection findings of a generic nature) influence the implementation of the proposed rule's requirements?

4. Are there unintended consequences? Does the proposed rule create conditions that would be contrary to the proposed rule's purpose and objectives? If so, what are the unintended consequences, and how should they be addressed?

5. Please comment on the NRC's cost and benefit estimates in the draft regulatory analysis that supports the proposed rule. The draft regulatory analysis is available as indicated in Section XVI, "Availability of Documents," of this document.

X. Plain Writing

The Plain Writing Act of 2010 (Pub. L. 111-274) requires Federal agencies to write documents in a clear, concise, and well-organized manner. The NRC has written this document to be consistent with the Plain Writing Act as well as the Presidential Memorandum, "Plain Language in Government Writing," published June 10, 1998. The NRC requests comment on this document with respect to the clarity and effectiveness of the language used.

XI. Environmental Assessment and Proposed Finding of No Significant Environmental Impact

The Commission has determined under NEPA and the Commission's regulations in subpart A of 10 CFR part 51, that this rule, if adopted, would not be a major Federal action

significantly affecting the quality of the human environment. Consequently, an environmental impact statement is not required. The basis of this determination reads as follows: The proposed rule to eliminate license terms for NPUFs, other than testing facilities, licensed under § 50.21(a) or (c) would result in no additional radiological or non-radiological impacts because of existing surveillance and oversight and the minimal consequences of MHAs for these facilities. In addition, the implementation of the proposed rulemaking would not affect the NEPA environmental review requirements of new facilities and facilities applying for license renewal. The NRC concludes that this proposed rule would not cause any additional radiological or non-radiological impacts on the human environment.

The determination of this environmental assessment (EA) is that there will be no significant effect on the quality of the human environment from this action. Public stakeholders should note, however, that comments on any aspect of the EA may be submitted to the NRC. The EA is available as indicated in Section XVI, "Availability of Documents," of this document.

The NRC has sent a copy of the EA and this proposed rule to every State Liaison Officer and has requested comments.

XII. Paperwork Reduction Act

This proposed rule contains new or amended collections of information subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq). This proposed rule has been submitted to the Office of Management and Budget (OMB) for approval of the information collections.

Type of submission, new or revision: Revision.

The title of the information collection: 10 CFR Part 50, Non-power Production or Utilization Facility License Renewal, Proposed Rule.

The form number if applicable: Not applicable.

How often the collection is required or requested: Once and annually.

Who will be required or asked to respond: NPUF licensees.

An estimate of the number of annual responses: 58 (27 reporting responses + 31 recordkeepers).

The estimated number of annual respondents: 31.

An estimate of the total number of hours needed annually to comply with the information collection requirement or request: 1,551.

Abstract: The proposed rule would result in incremental changes in recordkeeping and reporting burden relative to existing rules by eliminating license terms for class 104a or c NPUFs, other than testing facilities, and defining the license renewal process for class 103 NPUFs and testing facilities; and requiring the periodic submittal of updates to the FSAR. The NRC anticipates that, overall, the proposed rule would result in reduced burden on licensees and the NRC, and would create a more responsive and efficient licensing process that would continue to protect public health and safety, promote the common defense and security, and protect the environment.

Currently, NPUF licensees are not required to submit to the NRC updated FSARs. During the recent round of license renewals, the NRC found that some FSARs submitted with license renewal applications often did not reflect a facility's current licensing basis. The lack of ongoing FSAR updates added burden to the license renewal process for NPUF licensees and the NRC in order to re-establish each facility's licensing basis. Periodic submittals of updates to FSARs would create a mechanism for incorporating design and operational changes into the licensing basis as they occur. As a result, NPUFs would routinely update their licensing bases and the NRC would be made aware of changes to the licensing bases more frequently.

The NRC has determined that the proposed information collection requirements are necessary to ensure that: 1) licensee procedures are up-to-date and are consistent with the NRC's requirements, 2) licensing bases are not lost over time, and 3) the NRC is made aware of changes to facilities more frequently.

The NRC is seeking public comment on the potential impact of the information collections contained in this proposed rule and on the following issues:

1. Is the proposed information collection necessary for the proper performance of the functions of the NRC, including whether the information will have practical utility?

2. Is the estimate of burden of the proposed information collection accurate?

3. Is there a way to enhance the quality, utility, and clarity of the information to be collected?

4. How can the burden of the proposed information collection on respondents be minimized, including the use of automated collection techniques or other forms of information technology?

A copy of the OMB clearance package and proposed rule is available in ADAMS under Accession No. ML17068A077 or may be viewed free of charge at the NRC's PDR, One White Flint North, 11555 Rockville Pike, Room O-1 F21, Rockville, MD 20852. You may obtain

information and comment submissions related to the OMB clearance package by searching on http://www.regulations.gov under Docket ID NRC-2011-0087.

You may submit comments on any aspect of these proposed information collection(s), including suggestions for reducing the burden and on the previously stated issues, by the following methods:

- **Federal rulemaking Web Site:** Go to http://www.regulations.gov and search for Docket ID NRC-2011-0087.
- **Mail comments to:** Information Services Branch, Office of the Chief Information Officer, Mail Stop: T-2 F43, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001 or to Aaron Szabo, Desk Officer, Office of Information and Regulatory Affairs (3150-AI96), NEOB-10202, Office of Management and Budget, Washington, DC 20503; telephone: 202-395-3621, e-mail: oira_submission@omb.eop.gov.

Submit comments by May 1, 2017. Comments received after this date will be considered if it is practical to do so, but the NRC is able to ensure consideration only for comments received on or before this date.

Public Protection Notification

The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

XIII. Criminal Penalties

For the purposes of Section 223 of the AEA, the NRC is issuing this proposed rule that would amend 10 CFR 2.109, 50.2, 50.33, 50.34, 50.51, 50.59, 50.71, 50.82, and 51.45 and create 10 CFR 50.135 and 51.56 under one or more of Sections 161b, 161i, or 161o of the AEA. Willful violations of the rule would be subject to criminal enforcement.

XIV. Availability of Guidance

The NRC is issuing DG-2006, "Preparation of Updated Final Safety Analysis Reports for Non-power Production or Utilization Facilities," in accordance with 10 CFR 50.71(e), for the implementation of the proposed requirements in this rulemaking. The DG is available as indicated in Section XVI, "Availability of Documents," of this document. You may obtain information and comment submissions related to the DG by searching on http://www.regulations.gov under Docket ID NRC-2011-0087.

The draft implementing guidance defines multiple terms found in 10 CFR part 50 and other documents relevant to the preparation of FSARs, including aging; aging management; change; design bases; effects of changes; facility; FSAR (as updated); historical information; licensing basis; NPUFs; obsolete information, and safety related items. The NRC recognizes that changes to facilities may be necessary during the course of operations due to facilities' dynamic designs and operations; however, licensees must justify and implement any changes to the design basis and licensing basis in accordance with NRC regulations. The updated FSAR provides the NRC with the most current design and licensing bases for a licensee and provides the general public with a description of the facility and its operation. Section 50.34 and NUREG-1537, Part 1 provide the scope and format of an updated FSAR. Content should include changes to the facility or its operations resulting from new or amended regulatory requirements as well as changes and the effects of changes to the facility, its procedures, or

experiments. The NRC Facility Project Manager reserves the right to conduct an inspection related to changes reported in the updated FSAR.

You may submit comments on the DG by the following methods:

- **Federal rulemaking Web site:** Go to http://www.regulations.gov and search for Docket ID NRC-2011-0087. Address questions about NRC dockets to Carol Gallagher; telephone: 301-415-3463; e-mail: Carol.Gallagher@nrc.gov.

- **Mail comments to:** Cindy Bladey, Chief, Rules, Announcements, and Directives Branch (RADB), Office of Administration, Mail Stop: OWFN-12-H08, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

XV. Public Meeting

The NRC will conduct a public meeting on the proposed rule for the purpose of describing the proposed rule to the public and answering questions from the public to assist the public in providing informed comments on the proposed rule during the comment period.

The NRC will publish a notice of the location, time, and agenda of the meeting on the NRC's public meeting Web site at least 10 calendar days before the meeting. In addition, the NRC will post the meeting notice on Regulations.gov under NRC-2011-0087. Stakeholders should monitor the NRC's public meeting Web site for information about the public meeting at: http://www.nrc.gov/public-involve/public-meetings/index.cfm.

XVI. Availability of Documents

The documents identified in the following table are available to interested persons as indicated.

Document	ADAMS Accession No. / Web link / *FEDERAL REGISTER* CITATION
SECY-16-0048, "Proposed Rulemaking: Non-Power Production or Utilization Facility License Renewal"	ML16019A048
SRM-SECY-16-0048, "Proposed Rulemaking: Non-Power Production or Utilization Facility License Renewal"	ML17045A543
NUREG-1537, Part 1, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors, Format and Content"	ML042430055
NUREG-1537, Part 2, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors, Standard Review Plan and Acceptance Criteria"	ML042430048
Interim Staff Guidance on Streamlined Review Process for License Renewal for Research Reactors	ML091420066
Non-Power Reactor License Renewal: Preliminary Draft Regulatory Basis; Request for Comment	77 FR 38742; June 29, 2012
Regulatory Basis to Support Proceeding with Rulemaking to Streamline and Enhance the Research and Test Reactor (RTR) License Renewal Process	ML12240A677
Federal Register Notice: Final Regulatory Basis for Rulemaking to Streamline Non-Power Reactor License Renewal; Notice of Availability of Documents	ML12250A658
SECY-08-0161, "Review of Research and Test Reactor License Renewal Applications"	ML082550140
SRM-SECY-08-0161, "Review of Research and Test Reactor License Renewal Applications"	ML090850159
SRM-M080317B, "Briefing on State of NRC Technical Programs"	ML080940439
SECY-09-0095, "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"	ML092150717
SRM-SECY-91-061, "Separation of Non-Reactor and Non-Power Reactor Licensing Activities from Power Reactor Licensing Activities in 10 CFR Part 50"	ML010050021
SRM-M090811, "Briefing on Research and Test Reactor (RTR) Challenges"	ML092380046
Draft Regulatory Guide DG-2006, "Preparation of Updated Final Safety Analysis Reports for Non-Power Production or Utilization Facilities"	ML17068A041
Draft Regulatory and Backfit Analysis	ML17068A038

EPA 400-R-92-001, “Manual of Protective Action Guides and Protective Actions for Nuclear Incidents”	http://www2.epa.gov/sites/production/files/2014-11/documents/00000173.pdf
Summary of August 7, 2014 Public Meeting to Discuss the Rulemaking for Streamlining Non-power Reactor License Renewal	ML15322A400
Summary of October 7, 2015 Public Meeting to Discuss the Rulemaking for Streamlining Non-Power Reactor License Renewal	ML15307A002
Summary of September 13, 2011 Public Meeting to Discuss Streamlining Non-Power Reactor License Renewal	ML112710285
Summary of December 19, 2011 Public Meeting to Discuss the Regulatory Basis for Streamlining Non-Power Reactor License Renewal and Emergency Preparedness	ML113630166
Summary of March 27, 2012 Public Meeting: Briefing on License Renewal for Research and Test Reactors	ML120930333
Draft OMB Supporting Statement	ML17068A077
Draft Environmental Assessment	ML17068A035
Final Rule; Financial Information Requirements for Applications to Renew or Extend the Term of an Operating License for a Power Reactor	69 FR 4439; January 30, 2004
Final Rule; 10 CFR Part 50 – Licensing of Production and Utilization Facilities	33 FR 9704; July 4, 1968
Final Rule; Elimination of Review of Financial Qualifications of Electric Utilities in Licensing Hearings for Nuclear Power Plants	47 FR 13750; March 31, 1982
Final Rule; Elimination of Review of Financial Qualifications of Electric Utilities in Operating License Reviews and Hearings for Nuclear Power Plants	49 FR 35747; September 12, 1984
Final Regulations; National Environmental Policy Act—Regulations	43 FR 55978; November 29, 1978
Direct Final Rule; Definition of a Utilization Facility	79 FR 62329; October 17, 2014
Advanced Notice of Proposed Rulemaking; Revision of Backfitting Process for Power Reactors	48 FR 44217; September 28, 1983
Policy Statement; Revision of Backfitting Process for Power Reactors	48 FR 44173; September 28, 1983
Proposed Rule; Revision of Backfitting Process for Power Reactors	49 FR 47034; November 30, 1984
Final Rule; Revision of Backfitting Process for Power Reactors	50 FR 38097; September 20, 1985
Final Rule; Limiting the Use of Highly Enriched Uranium in Domestically Licensed Research and Test Reactors	51 FR 6514; March 27, 1986
Final Rule; Clarification of Physical Protection Requirements at Fixed Sites	58 FR 13699; March 15, 1993

Final Rule; Requirements for Fingerprint-Based Criminal History Record Checks for Individuals Seeking Unescorted Access to Non-Power Reactors	77 FR 27561, 27572; May 11, 2012
Plain Language in Government Writing	63 FR 31885; June 10, 1998

Throughout the development of this rule, the NRC may post documents related to this rule, including public comments, on the Federal rulemaking Web site at http://www.regulations.gov under Docket ID NRC-2011-0087. The Federal rulemaking Web site allows you to receive alerts when changes or additions occur in a docket folder. To subscribe: 1) Navigate to the docket folder (NRC-2011-0087); 2) click the "Sign up for E-mail Alerts" link; and 3) enter your e-mail address and select how frequently you would like to receive e-mails (daily, weekly, or monthly).

List of Subjects

10 CFR Part 2

Administrative practice and procedure, Antitrust, Byproduct material, Classified information, Confidential business information; Freedom of information, Environmental protection, Hazardous waste, Nuclear energy, Nuclear materials, Nuclear power plants and reactors, Penalties, Reporting and recordkeeping requirements, Sex discrimination, Source material, Special nuclear material, Waste treatment and disposal.

10 CFR Part 50

Administrative practice and procedure, Antitrust, Classified information, Criminal penalties, Education, Fire prevention, Fire protection, Incorporation by reference, Intergovernmental relations, Nuclear power plants and reactors, Penalties, Radiation protection, Reactor siting criteria, Reporting and recordkeeping requirements, Whistleblowing.

10 CFR Part 51

Administrative practice and procedure, Environmental impact statements, Hazardous waste, Nuclear energy, Nuclear materials, Nuclear power plants and reactors, Reporting and recordkeeping requirements.

For the reasons set out in the preamble and under the authority of the AEA, as amended; the Energy Reorganization Act of 1974, as amended; and 5 U.S.C. 552 and 553, the NRC is proposing to adopt the following amendments to 10 CFR parts 2, 50, and 51:

PART 2 -- AGENCY RULES OF PRACTICE AND PROCEDURE

1. The authority citation for part 2 continues to read as follows:

Authority: Atomic Energy Act of 1954, secs. 29, 53, 62, 63, 81, 102, 103, 104, 105, 161, 181, 182, 183, 184, 186, 189, 191, 234 (42 U.S.C. 2039, 2073, 2092, 2093, 2111, 2132, 2133, 2134, 2135, 2201, 2231, 2232, 2233, 2234, 2236, 2239, 2241, 2282); Energy Reorganization Act of 1974, secs. 201, 206 (42 U.S.C. 5841, 5846); Nuclear Waste Policy Act of 1982, secs. 114(f), 134, 135, 141 (42 U.S.C. 10134(f), 10154, 10155, 10161); Administrative Procedure Act (5 U.S.C. 552, 553, 554, 557, 558); National Environmental Policy Act of 1969 (42 U.S.C. 4332); 44 U.S.C. 3504 note.

Section 2.205(j) also issued under 28 U.S.C. 2461 note.

2. In § 2.109, revise paragraph (a) and add paragraph (e) to read as follows:

§ 2.109 Effect of timely renewal application.

(a) Except for the renewal of an operating license for a nuclear power plant under 10 CFR 50.21(b) or 50.22, a non-power production or utilization facility, an early site permit under subpart A of part 52 of this chapter, a manufacturing license under subpart F of part 52 of this chapter, or a combined license under subpart C of part 52 of this chapter, if at least 30 days before the expiration of an existing license authorizing any activity of a continuing nature, the licensee files an application for a renewal or for a new license for the activity so authorized, the existing license will not be deemed to have expired until the application has been finally determined.

* * * * *

(e) If the licensee of a non-power production or utilization facility licensed under 10 CFR 50.22, or testing facility, files a sufficient application for renewal at least 2 years before the expiration of the existing license, the existing license will not be deemed to have expired until the application has been finally determined.

PART 50 -- DOMESTIC LICENSING OF PRODUCTION AND UTILIZATION FACILITIES

3. The authority citation for part 50 continues to read as follows:

Authority: Atomic Energy Act of 1954, secs. 11, 101, 102, 103, 104, 105, 108, 122, 147, 149, 161, 181, 182, 183, 184, 185, 186, 187, 189, 223, 234 (42 U.S.C. 2014, 2131, 2132, 2133, 2134, 2135, 2138, 2152, 2167, 2169, 2201, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2239, 2273, 2282); Energy Reorganization Act of 1974, secs. 201, 202, 206, 211 (42 U.S.C. 5841, 5842, 5846, 5851); Nuclear Waste Policy Act of 1982, sec. 306 (42 U.S.C. 10226); National Environmental Policy Act of 1969 (42 U.S.C. 4332); 44 U.S.C. 3504 note; Sec. 109, Pub. L. 96–295, 94 Stat. 783.

4. In § 50.2, add, in alphabetical order, the definition for *non-power production or utilization facility* to read as follows:

§ 50.2 Definitions.

* * * * *

Non-power production or utilization facility means a non-power reactor, testing facility, or other production or utilization facility, licensed under § 50.21(a), § 50.21(c), or § 50.22, that is not a nuclear power reactor or fuel reprocessing plant.

* * * * *

5. In § 50.8, revise paragraph (b) to read as follows:

§ 50.8 Information collection requirements: OMB approval.

* * * * *

(b) The approved information collection requirements contained in this part appear in §§ 50.30, 50.33, 50.34, 50.34a, 50.35, 50.36, 50.36a, 50.36b, 50.44, 50.46, 50.47, 50.48, 50.49, 50.54, 50.55, 50.55a, 50.59, 50.60, 50.61, 50.61a, 50.62, 50.63, 50.64, 50.65, 50.66, 50.68, 50.69, 50.70, 50.71, 50.72, 50.74, 50.75, 50.80, 50.82, 50.90, 50.91, 50.120, 50.135, 50.150, and appendices A, B, E, G, H, I, J, K, M, N, O, Q, R, and S to this part.

* * * * *

6. In § 50.33, revise paragraph (f)(2) to read as follows:

§ 50.33 Contents of applications; general information.

* * * * *

(f) * * *

(2) If the application is for an operating license, the applicant shall submit information that demonstrates the applicant possesses or has reasonable assurance of obtaining the funds necessary to cover estimated operation costs for the period of the license. The applicant shall submit estimates for total annual operating costs for each of the first 5 years of operation of the facility. The applicant shall also indicate the source(s) of funds to cover these costs. An applicant seeking to renew or extend the term of an operating license need not submit the financial information that is required in an application for an initial license.

* * * * *

7. In § 50.34, revise paragraph (a)(1)(ii)(D) to read as follows:

§ 50.34 Contents of applications; technical information.

(a) * * *

(1) * * *

(ii) * * *

(D) The safety features that are to be engineered into the facility and those barriers that must be breached as a result of an accident before a release of radioactive material to the environment can occur. Special attention must be directed to design features intended to mitigate the radiological consequences of accidents.

(1) In performing this assessment for a nuclear power reactor, an applicant shall assume a fission product release[6] from the core into the containment assuming that the facility is

[6] The fission product release assumed for this evaluation should be based upon a major accident, hypothesized for purposes of site analysis or postulated from considerations of possible accidental events. Such accidents have generally been assumed to result in substantial meltdown of the core with subsequent release into the containment of appreciable quantities of fission products.

operated at the ultimate power level contemplated. The applicant shall perform an evaluation and analysis of the postulated fission product release, using the expected demonstrable containment leak rate and any fission product cleanup systems intended to mitigate the consequences of the accidents, together with applicable site characteristics, including site meteorology, to evaluate the offsite radiological consequences. Site characteristics must comply with part 100 of this chapter. The evaluation must determine that:

(i) An individual located at any point on the boundary of the exclusion area for any 2-hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 25 rem[7] total effective dose equivalent (TEDE).

(ii) An individual located at any point on the outer boundary of the low population zone, who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage) would not receive a radiation dose in excess of 25 rem TEDE.

(2) All holders of operating licenses issued to non-power production or utilization facilities, and applicants for renewed licenses for non-power production or utilization facilities under § 50.135 of this chapter not subject to 10 CFR part 100, shall provide an evaluation of the applicable radiological consequences in the facility safety analysis report that demonstrates with reasonable assurance that any individual located in the unrestricted area following the onset of a postulated accidental release of licensed material, including consideration of experiments, would not receive a radiation dose in excess of 1 rem (0.01 Sv) TEDE for the duration of the accident.

* * * * *

[7] A whole body dose of 25 rem has been stated to correspond numerically to the once in a lifetime accidental or emergency dose for radiation workers which, according to NCRP recommendations at the time could be disregarded in the determination of their radiation exposure status (see NBS Handbook 69 dated June 5, 1959). However, its use is not intended to imply that this number constitutes an acceptable limit for an emergency dose to the public under accident conditions. Rather, this dose value has been set forth in this section as a reference value, which can be used in the evaluation of plant design features with respect to postulated reactor accidents, in order to assure that such designs provide assurance of low risk of public exposure to radiation, in the event of such accidents.

8. In § 50.51, revise paragraph (a) and add paragraph (c) to read as follows:

§ 50.51 Continuation of license.

(a) Except as noted in § 50.51(c), each license will be issued for a fixed period of time to be specified in the license but in no case to exceed 40 years from date of issuance. Where the operation of a facility is involved, the Commission will issue the license for the term requested by the applicant or for the estimated useful life of the facility if the Commission determines that the estimated useful life is less than the term requested. Where construction of a facility is involved, the Commission may specify in the construction permit the period for which the license will be issued if approved pursuant to § 50.56. Licenses may be renewed by the Commission upon the expiration of the period. Renewal of operating licenses for nuclear power plants is governed by 10 CFR part 54. Application for termination of license is to be made pursuant to § 50.82.

* * * * *

(c) Each non-power production or utilization facility license, other than a testing facility license, issued under § 50.21(a) or (c) after **[EFFECTIVE DATE OF FINAL RULE]** will be issued with no fixed license term.

9. In § 50.59, revise paragraph (b) to read as follows:

§ 50.59 Changes, tests and experiments.

* * * * *

(b) This section applies to each holder of an operating license issued under this part or a combined license issued under part 52 of this chapter, including the holder of a license

authorizing operation of a nuclear power reactor that has submitted the certification of permanent cessation of operations required under § 50.82(a)(1) or § 50.110, or a reactor licensee whose license has been amended to allow possession of nuclear fuel but not operation of the facility, or a non-power production or utilization facility that has permanently ceased operations.

* * * * *

10. In § 50.71, revise paragraph (e) introductory text and paragraph (e)(3)(i), add new paragraph (e)(3)(iv), and revise paragraph (e)(4) to read as follows:

§ 50.71 Maintenance of records, making of reports.

* * * * *

(e) Each person licensed to operate a nuclear power reactor, or non-power production or utilization facility, under the provisions of § 50.21 or § 50.22, and each applicant for a combined license under part 52 of this chapter, shall update periodically, as provided in paragraphs (e)(3) and (4) of this section, the final safety analysis report (FSAR) originally submitted as part of the application for the license, to assure that the information included in the report contains the latest information developed. This submittal shall contain all the changes necessary to reflect information and analyses submitted to the Commission by the applicant or licensee or prepared by the applicant or licensee pursuant to Commission requirement since the submittal of the original FSAR, or as appropriate, the last update to the FSAR under this section. The submittal shall include the effects[1] of all changes made in the facility or procedures as described in the FSAR; all safety analyses and evaluations performed by the applicant or licensee either in support of approved license amendments or in support of conclusions that changes did not

[1] Effects of changes include appropriate revisions of descriptions in the FSAR such that the FSAR (as updated) is complete and accurate.

require a license amendment in accordance with § 50.59(c)(2) or, in the case of a license that references a certified design, in accordance with § 52.98(c) of this chapter; and all analyses of new safety issues performed by or on behalf of the applicant or licensee at Commission request. The updated information shall be appropriately located within the update to the FSAR.

* * * * *

(3)(i) For nuclear power reactor licensees, a revision of the original FSAR containing those original pages that are still applicable plus new replacement pages shall be filed within 24 months of either July 22, 1980, or the date of issuance of the operating license, whichever is later, and shall bring the FSAR up to date as of a maximum of 6 months prior to the date of filing the revision.

* * * * *

(iv) For non-power production or utilization facility licenses issued after **[EFFECTIVE DATE OF FINAL RULE]**, a revision of the original FSAR must be filed within 5 years of the date of issuance of the operating license. The revision must bring the FSAR up to date as of a maximum of 6 months prior to the date of filing the revision.

(4)(i) For nuclear power reactor licensees, subsequent revisions must be filed annually or 6 months after each refueling outage provided the interval between successive updates does not exceed 24 months. The revisions must reflect all changes up to a maximum of 6 months prior to the date of filing. For nuclear power reactor facilities that have submitted the certifications required by § 50.82(a)(1), subsequent revisions must be filed every 24 months.

(ii) Non-power production or utilization facility licensees shall file subsequent FSAR updates at intervals not to exceed 5 years. Each update must reflect all changes made to the FSAR up to a maximum of 6 months prior to the date of filing the update.

* * * * *

11. In § 50.82, revise paragraph (b) introductory text and paragraphs (b)(1) and (c) to

read as follows:

§ 50.82 Termination of license.

* * * * *

(b) For non-power production or utilization facility licensees—

(1) A licensee that permanently ceases operations must make application for license termination within 2 years following permanent cessation of operations, and for testing facilities licensed under § 50.21(c) or holders of a license issued under § 50.22, in no case later than 1 year prior to expiration of the operating license. Each application for termination of a license must be accompanied or preceded by a proposed decommissioning plan. The contents of the decommissioning plan are specified in paragraph (b)(4) of this section.

* * * * *

(c) The collection period for any shortfall of funds will be determined, upon application by the licensee, on a case-by-case basis taking into account the specific financial situation of each holder of the following licenses:

(1) A non-power production or utilization facility license issued under § 50.21(a) or § 50.21(c), other than a testing facility, that has permanently ceased operations.

(2) A license issued under § 50.21(b) or § 50.22, or a testing facility, that has permanently ceased operation before the expiration of its license.

12. Add new § 50.135 to read as follows:

§ 50.135 License renewal for non-power production or utilization facilities licenses issued under § 50.22 and testing facility licensees.

(a) Applicability. The requirements in this section apply to applicants for renewed non-power production or utilization facility operating licenses issued under § 50.22 and to applicants for renewed testing facility operating licenses issued under § 50.21(c).

(b) Written communications. All applications, correspondence, reports, and other written communications must be filed in accordance with applicable portions of § 50.4.

(c) Filing of application.

(1) The filing of an application for a renewed license must be in accordance with subpart A of 10 CFR part 2 and all applicable sections of this part.

(2) An application for a renewed license may not be submitted to the Commission earlier than 10 years before the expiration of the operating license currently in effect.

(d) Contents of application.

(1) Each application must provide the information specified in §§ 50.33, 50.34, and 50.36, as applicable.

(2) Each application must include conforming changes to the standard indemnity agreement, under 10 CFR part 140 to account for the expiration term of the proposed renewed license.

(3) Contents of application--environmental information. Each application must include a supplement to the environmental report that complies with the requirements of 10 CFR 51.56.

(e) Issuance of a renewed license.

(1) A renewed license will be of the class for which the operating license currently in effect was issued.

(2) A renewed license will be issued for a fixed period of time, which is the sum of the additional amount of time beyond the expiration of the operating license (not to exceed 30 years) that is requested in a renewal application plus the remaining number of years on the operating license currently in effect. The term of any renewed license may not exceed 40 years.

(3) A renewed license will become effective 30 days after its issuance, thereby superseding the operating license previously in effect. If a renewed license is subsequently set aside upon further administrative or judicial appeal, the operating license previously in effect will be reinstated unless its term has expired and the renewal application was not filed in a timely manner.

(4) A renewed license may be subsequently renewed in accordance with all applicable requirements.

PART 51 -- ENVIRONMENTAL PROTECTION REGULATIONS FOR DOMESTIC LICENSING AND RELATED REGULATORY FUNCTIONS

13. The authority citation for part 51 continues to read as follows:

Authority: Atomic Energy Act of 1954, secs. 161, 193 (42 U.S.C. 2201, 2243); Energy Reorganization Act of 1974, secs. 201, 202 (42 U.S.C. 5841, 5842); National Environmental Policy Act of 1969 (42 U.S.C. 4332, 4334, 4335); Nuclear Waste Policy Act of 1982, secs. 144(f), 121, 135, 141, 148 (42 U.S.C. 10134(f), 10141, 10155, 10161, 10168); 44 U.S.C. 3504 note.

14. In § 51.17, revise paragraph (b) to read as follows:

§ 51.17 Information collection requirements; OMB approval.

* * * * *

(b) The approved information collection requirements in this part appear in §§ 51.6, 51.16, 51.41, 51.45, 51.49, 51.50, 51.51, 51.52, 51.53, 51.54, 51.55, 51.56, 51.58, 51.60, 51.61, 51.62, 51.66, 51.68, and 51.69.

15. In § 51.45, revise paragraph (a) to read as follows:

§ 51.45 Environmental report.

(a) General. As required by §§ 51.50, 51.53, 51.54, 51.55, 51.56, 51.60, 51.61, 51.62, or 51.68, as appropriate, each applicant or petitioner for rulemaking shall submit with its application or petition for rulemaking one signed original of a separate document entitled "Applicant's" or "Petitioner's Environmental Report," as appropriate. An applicant or petitioner for rulemaking may submit a supplement to an environmental report at any time.

* * * * *

16. Add new § 51.56 to read as follows:

§ 51.56 Environmental report—non-power production or utilization facility licenses.

Each applicant for a non-power production or utilization facility license or other form of permission, or renewal of a non-power production or utilization facility license or other form of permission issued pursuant to §§ 50.21(a) or (c) or § 50.22 of this chapter shall submit a separate document, entitled "Applicant's Environmental Report" or "Supplement to Applicant's Environmental Report," as appropriate, with its application to: ATTN: Document Control Desk, Director, Office of Nuclear Reactor Regulation. The environmental report or supplement shall contain the information specified in § 51.45. If the application is for a renewal of a license or other form of permission for which the applicant has previously submitted an environmental report, the supplement, to the extent applicable, shall include an analysis of any environmental

impacts resulting from operational experience or a change in operations, and an analysis of any environmental impacts that may result from proposed decommissioning activities. The supplement may incorporate by reference the previously submitted environmental report, or portions thereof.

Dated at Rockville, Maryland, this 23rd day of March, 2017.

For the Nuclear Regulatory Commission.

/RA/

Annette L. Vietti-Cook,
Secretary of the Commission.

DRAFT
Environmental Assessment Supporting Proposed Rule: Non-power Production or Utilization Facility License Renewal

U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation

March 2017

UNITED STATES NUCLEAR REGULATORY COMMISSION

DRAFT ENVIRONMENTAL ASSESSMENT AND FINDING OF

NO SIGNIFICANT IMPACT

INTRODUCTION

The U.S. Nuclear Regulatory Commission (NRC) is proposing a rulemaking (referred to throughout as the proposed action) to amend its regulations that govern the license renewal process for non-power reactors, testing facilities, and other production or utilization facilities, licensed under the authority of Section 103, Section 104a, or Section 104c of the Atomic Energy Act of 1954, as amended (AEA), that are not nuclear power reactors. In the proposed action, the NRC collectively refers to these facilities as non-power production or utilization facilities (NPUFs). This document presents the environmental assessment (EA) of the proposed action. Currently, 31 NPUFs are operating in the United States. In addition, the NRC has recently received two license applications for new NPUFs and expects additional applications in the coming years. The proposed action would affect class 103 facilities (reactors used for commercial or industrial purposes), and class 104a and 104c facilities (reactors used for medical therapy and research and development activities), as defined in the AEA. The proposed action would: 1) create a definition for “non-power production or utilization facility,” or “NPUF”; 2) eliminate license terms for NPUFs licensed under paragraph (a) or (c) of section 21 of title 10 of the *Code of Federal Regulations* (10 CFR), other than testing facilities, which are licensed under 10 CFR 50.21(c) but will continue to have license terms; 3) define the license renewal process for testing facilities licensed under § 50.21(c) and NPUFs licensed under 10 CFR 50.22; 4) require all NPUF licensees to submit updates to the final safety analysis report (FSAR) every five years; 5) amend the current timely renewal provision under 10 CFR 2.109, allowing facilities to continue operating under an existing license past its expiration date if the facility submits a license renewal application at least two years (currently 30 days) before

the current license expiration date; 6) provide an accident dose criterion of 1 rem (0.01 Sievert (Sv)) total effective dose equivalent (TEDE) for NPUFs other than testing facilities; 7) extend the applicability of 10 CFR 50.59 to NPUFs regardless of their decommissioning status; 8) clarify an applicant's requirements for meeting the existing provisions of 10 CFR 51.45; and 9) eliminate the requirement for NPUFs to submit financial qualification information with license renewal applications under 10 CFR 50.33(f)(2).

In accordance with §§ 51.21, 51.30, and 51.33, the NRC has prepared this draft EA and draft finding of no significant impact (FONSI) for the proposed action to issue a rule to streamline the license renewal process for NPUFs, as published in the Federal Register on [PROPOSED RULE PUBLICATION DATE] ([PROPOSED RULE FEDERAL REGISTER CITATION]). The EA is available in the NRC's Agencywide Documents Access and Management System (ADAMS) under Accession No. ML17068A035 and on www.regulations.gov under Docket ID NRC-2011-0087.

Under the National Environmental Policy Act of 1969, as amended (NEPA), and the NRC's regulations in subpart A of 10 CFR part 51, the NRC staff has determined that this rule, if adopted, would not be a major Federal action significantly affecting the quality of the human environment. Therefore, the NRC staff has determined that preparation of an environmental impact statement (EIS) is not required. Based on the following EA, the NRC staff proposes to issue a FONSI.

ENVIRONMENTAL ASSESSMENT

Identification of the Proposed Action:

The NPUFs are relatively low-power facilities primarily used for research, training, and development. The proposed action would affect class 103 facilities (for facilities used for commercial or industrial purposes) and class 104a or c facilities (for medical therapy and research and development activities) as defined in the AEA. As part of its oversight of NPUFs, the NRC administers an initial licensing process, which includes license terms defined under

10 CFR 50.51(a), followed by a license renewal process for those that seek to continue operating beyond their initial license term. In 2008, the NRC identified a need to identify and implement efficiencies in the NPUF license renewal process to streamline the process while ensuring that adequate protection of public health and safety is maintained. This need for improvement in the reliability and efficiency of the process was primarily driven by four issues: 1) historic NRC staffing and emergent issues; 2) limited licensee resources; 3) inconsistent existing license infrastructure; and 4) regulatory requirements and the broad scope of the renewal process.

To avoid such a backlog from developing again, the NRC is proposing to streamline the license renewal process for NPUFs. To achieve this objective, the NRC proposes to take the following actions:

1. Establish a regulatory framework for the license renewal process for testing facilities licensed under § 50.21(c) and NPUFs licensed under 10 CFR 50.22.
2. Eliminate license terms for NPUFs, other than testing facilities, licensed under 10 CFR 50.21(a) or (c).
3. Require all NPUF licensees to submit updated FSARs at intervals not to exceed five years.
4. Extend the timely renewal provision from 30 days to two years for testing facilities licensed under § 50.21(c) and NPUFs licensed under 10 CFR 50.22.

To achieve these objectives, the proposed action would amend various sections of 10 CFR parts 2, 50, and 51, as follows:

- **10 CFR 2.109—Effect of timely renewal application**. The current process allows NPUF licensees to submit license renewal applications as late as 30 days before the expiration of the existing license. The proposed rule would require the submittal of license renewal applications at least two years prior to license expiration for testing facilities licensed under § 50.21(c) and NPUFs licensed under § 50.22.

- **10 CFR 50.2—Definitions**. The proposed rule would add a definition for the term "non-power production or utilization facility" to cover all non-power facilities licensed under § 50.21(a), § 50.21(c), or § 50.22, including medical radioisotope irradiation and processing facilities, research reactors, and testing facilities.
- **10 CFR 50.33—Contents of applications; general information.** Non-power production or utilization facility license renewal applicants would no longer be required to include the financial qualification information that is required in the initial license application.
- **10 CFR 50.34—Contents of applications; technical information.** The proposed rule would establish an accident dose criterion for NPUFs, other than testing facilities subject to 10 CFR part 100. Currently, the NRC uses part 20 for NPUF accident dose limits. The proposed rule would make a conforming change to § 50.34(a)(1)(ii)(D) to clarify sections applicable to power reactors only, and to renumber those sections that only apply to power reactors. Although the new accident dose criterion specified in proposed § 50.34(a)(1)(ii)(D)(2) is higher than the current dose limit to members of the public in 10 CFR 20.1301(a)(1), the proposed accident dose criterion aligns with the early phase protective action guides published by the Environmental Protection Agency and provides adequate protection of the public from unnecessary exposure to radiation. Further, based on its knowledge of NPUF operating experience, the NRC notes that all current NPUF licensees meet more stringent dose criteria than those that would be established in the proposed rule.
- **10 CFR 50.51—Continuation of license.** The proposed rule would modify § 50.51(a) to include an exception to license terms for eligible NPUFs and would add § 50.51(c) to eliminate license terms for eligible NPUFs.
- **10 CFR 50.59—Changes, tests, and experiments.** The proposed rule would modify the applicability of this section to include NPUFs that are in the process of

decommissioning and no longer have fuel (e.g., they have returned their fuel to the Department of Energy).

- **10 CFR 50.71—Maintenance of records, making of reports.** The proposed rule would require NPUFs to submit updated FSARs at intervals not to exceed five years. The proposed rule also would make conforming changes to § 50.71(e)(3) and (e)(4) to explicitly identify the applicability of existing requirements to power reactors.
- **10 CFR 50.82—Termination of license.** The proposed rule would make conforming changes to this section to modify current termination of license requirements so that they refer to "non-power production or utilization facility" licensees and not to "non-power reactor" licensees, and would make conforming changes to reflect non-expiring license terms for qualifying NPUFs (i.e., currently operating research reactors).
- **10 CFR 51.45—Environmental Report.** The proposed rule would modify § 51.45(a) to reference new § 51.56, described below.

The proposed action also would add a new section to part 50—§ 50.135—which would establish the license renewal process for testing facilities licensed under § 50.21(c) and NPUFs licensed under § 50.22. Proposed § 50.135 would not change the current license renewal application process, but would provide the NRC with a regulatory framework specific to the NPUF license renewal process. A framework specific to this process currently does not exist. A new section also would be added to part 51—§ 51.56—to specify environmental reporting requirements for NPUF licensees and applicants. Similar to proposed § 50.135, this new section would not change current requirements, but would instead clarify an applicant's existing requirements for the submittal of environmental reports. Environmental reports would include the information specified in § 51.45, but applicants pursuing license renewal who have previously submitted an environmental report to the NRC would be permitted to reference, update, or supplement the information previously submitted to reflect any significant environmental change due to operational experience, changes in operations, or proposed decommissioning activities.

The Need for the Proposed Action:

The purpose of the proposed regulatory action is to streamline the NPUF license renewal process and make it a less burdensome process for both license renewal applicants and the NRC staff, consistent with the minimum regulation standard established in Section 104 of the AEA, while continuing to protect public health and safety, promote common defense and security, and protect the environment. Additionally, the proposed action would prevent backlogs of NPUF license renewal applications, similar to the one that developed in late 2001.

In addition, more specific dose criteria in accident analyses for NPUFs, other than those NPUFs subject to part 100, are needed. Since January 1, 1994, for NPUF licensees (other than testing facilities) applying for initial or renewed licensees, the NRC applies the accident dose criterion by comparing the results from the initial or renewed license applicant's accident analyses with the standards in 10 CFR part 20.[1] Prior to that date, the NRC had generally found acceptable accident doses that were less than 0.5 rem (0.005 Sv) whole body and 3 rem (0.03 Sv) thyroid for members of the public. On January 1, 1994, the NRC amended 10 CFR part 20 to lower the dose limit to a member of the public to 0.1 rem (0.001 Sv) TEDE. The NRC has determined that the public dose limit of 0.1 rem (0.001 Sv) TEDE is unduly restrictive to be applied as accident dose criteria for NPUFs, other than those NPUFs subject to 10 CFR part 100.[2] However, the NRC considers the accident dose criteria in 10 CFR part 100 (25 rem whole body and 300 rem to the thyroid) applicable to accident consequences for power reactors, which have greater potential consequences resulting from an accident, to be too high for NPUFs other than testing facilities. For these reasons, the NRC is proposing to amend its regulations in § 50.34 to add accident dose criteria for NPUFs not subject to part 100.

Environmental Impacts of the Proposed Action:

[1] For testing facilities, accident dose criteria are found in part 100.
[2] The NRC Atomic Safety and Licensing Appeal Board stated that the standards in part 20 are unduly restrictive as accident dose criteria for research reactors. (Trustees of Columbia University in the City of New York, ALAB-50, 4 AEC 849, 854-855 (May 18, 1972)).

The NRC has evaluated the potential environmental and radiological impacts unique to each site for currently licensed NPUFs at the time of initial licensing and for at least one license renewal application, taking into account nearby facilities and residences, site safety evaluations, technical specifications of the reactors, and exposure limits. Through this process, the NRC staff has determined that the continued operation of existing licensed NPUFs does not pose a significant environmental impact. This proposed action would not alter the characteristics of any particular NPUF site, and therefore would not change the findings of previously conducted EAs and associated Findings of No Significant Impact. The proposed action also would not increase the likelihood of accidents or increase their impacts, in the very unlikely event that an accident should occur.

The proposed action would eliminate the license renewal process for NPUFs licensed under § 50.21(a) or (c), other than testing facilities. Therefore, the proposed action would eliminate the opportunity for the NRC to conduct an EA at the time of license renewal for NPUFs licensed under § 50.21(a) or (c), other than testing facilities, as there would be no agency action and hence, no requirement to conduct a NEPA analysis. The proposed action would not change the license renewal process for NPUFs licensed under § 50.22, or testing facilities.[3] The rule also would require updated FSAR submissions more frequently, which would provide the NRC with periodic, updated information about the safety conditions of each facility. The FSAR submissions would enhance the information currently available to the NRC, and may help parties identify safety issues sooner, thereby decreasing the potential for environmental impacts.

[3] While the AEA does not establish a fixed license term for testing facilities, these facilities are currently subject to additional requirements due to higher power levels (e.g., ACRS review, preparation of environmental impact statements). Therefore, the NRC is proposing to continue license renewal for testing facilities because of their higher environmental risk relative to other NPUFs licensed under § 50.21(a) or (c).

This EA considers the environmental impacts associated with the proposed changes affecting the following licensees: 1) NPUFs licensed under § 50.22 and testing facilities; and 2) NPUFs licensed under § 50.21(a) or (c) other than testing facilities.

1. Non-power production or utilization facilities licensed under 10 CFR 50.22 (class 103 NPUFs) and testing facilities licensed under § 50.21(c) (certain class 104(c) NPUFs): These NPUFs would experience no changes in the license renewal process. As a result, there would not be a change in environmental impacts from the proposed action. The proposed action would not eliminate the license renewal process for these facilities, and therefore, the NRC would still complete either an EA or an EIS before determining whether to approve a license renewal application for this type of facility. As described in the Notice of Proposed Rulemaking, the proposed action also would specify that applicants for new licenses or license renewals must submit certain information to the NRC in the form of an environmental report or a supplement to an environmental report as specified in proposed § 51.56.

2. Facilities licensed under 10 CFR 50.21(a) or (c) (class 104 NPUFs), other than testing facilities: Under the proposed action, these facilities would be eligible for non-expiring license terms, and therefore, the NRC would only perform an EA at the time of initial licensing (which has already been performed for existing licensees). After initial licensing, the NRC would only perform an environmental review for these NPUFs upon submittal of an application for a license amendment or a request for an exemption. The NRC would prepare an EA as required by § 51.21 and in accordance with the requirements of § 51.30, or the staff would document its determination that the requested change qualifies for a categorical exclusion under § 51.22. As discussed in this EA, the NRC staff has concluded that the indefinite extension of the license term would not pose significant environmental impacts for two reasons: 1) consequences of

accidents at NPUFs are not significant; and 2) aging-related issues do not pose a potential for environmental impacts.

The analysis and conclusions discussed below are based on Appendix 12.1 in NUREG-1537, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors," part 2, "Standard Review Plan and Acceptance Criteria" (ADAMS Accession No. ML042430048), which documents the environmental considerations associated with licensing low-power NPUFs. The EAs that have been performed since issuance of these environmental considerations (1996) indicate that there is no new information with respect to the environmental findings for operating NPUFs.

Consideration of Potential Environmental and Accident Consequences. The NPUFs licensed under § 50.21(a) or (c), other than testing facilities, operate at low power levels (as identified in Table 1), temperatures, and pressures, and have a small inventory of fission products in the fuel, as compared to power reactors, therefore presenting a lower potential radiological risk to the environment and the public.

Table 1. List of Non-power Production or Utilization Facilities with Operating Licenses Under 10 CFR 50.21(a) or (c), Other Than Testing Facilities

Facility Name	Power Level kW(t)	Last License Renewal or Issuance Date
Aerotest	250	7/2/1965
Armed Forces Radiobiology Research Institute	1,100	8/1/1984
Dow Chemical Company	300	6/18/2014
GE-Hitachi	100	4/21/2001
Idaho State University	0.005	8/14/2006
Kansas State University	250	3/19/2008
Massachusetts Institute of Technology	5,000	11/1/2010
Missouri University of Science and Technology	200	3/30/2009
North Carolina State University	1,000	4/30/1997
Ohio State University	500	6/18/2008
Oregon State University	1,100	9/10/2008
Pennsylvania State University	1,100	11/19/2009
Purdue University	1	8/8/1988

Facility Name	Power Level kW(t)	Last License Renewal or Issuance Date
Reed College	250	4/24/2012
Rensselaer Polytechnic Institute	0.1	6/27/2011
Rhode Island Atomic Energy Commission	2,000	7/23/1964
Texas A&M University (AGN)	0.005	8/26/1957
Texas A&M University (TRIGA)	1,000	10/1/2015
U.S. Geological Survey	1,000	2/24/1969
University of California/Davis	2,300	8/13/1998
University of California/Irvine	250	11/24/1969
University of Florida	100	8/30/1982
University of Maryland	250	8/7/1984
University of Massachusetts/Lowell	1,000	11/21/1985
University of Missouri/Columbia	10,000	10/11/1966
University of New Mexico	0.005	2/18/2011
University of Texas	1,100	1/17/1992
University of Utah	100	10/31/2011
University of Wisconsin	1,000	3/25/2011
Washington State University	1,000	9/30/2011

Twenty-seven[4] of the 31 currently licensed facilities' cores are submerged in a tank or pool of water. These volumes of water, ranging from 5,000 to more than 100,000 gallons, provide a built-in heat sink for decay heat. Twenty-five of these 27 licensed facilities are not required to have emergency core cooling systems (ECCS) as analysis has shown that air cooling is sufficient to remove decay heat if the water was not present. These NPUFs do not have significant decay heat, even after extended maximum licensed power operation, to be a risk for overheating, failure of a fission product barrier, or posing a threat to public health and safety even under a loss of coolant accident where water levels drop below the core. Additionally, many of the facilities monitor for leaks in the form of routine inspections, track and trend water inventory, and perform surveillances on installed pool level instrumentation and sensors. Licensees perform analyses for radioisotope identification of primary and, if applicable, secondary coolant, by sampling the water periodically. Many facilities sample weekly for gross radioactive material content which is also used to establish trends to quickly identify fuel or heat exchanger failure. Most of these licensees analyze, in their FSARs, pool and heat exchanger failures and the potential consequences for the safety of the reactor, workers, and public. In general, the radioisotope concentrations in pool or tank water at NPUFs are within the effluent concentration limits specified in Appendix B to 10 CFR part 20, and thus are not radiologically significant.

Only two of the NPUFs licensed under § 50.21(a) or (c), other than the one testing facility, are required by their safety analyses to have an ECCS. For these NPUFs,[5] the ECCS is only needed to direct flow into the top of the tank or pool to

[4] The three Aerojet-General Nucleonics (AGN) reactors (University of New Mexico (Docket No. 50-252), Idaho State University (Docket No. 50-284), and Texas A&M University (Docket No. 50-59)), each rated at 5-watts, and the University of Florida Argonaut reactor (Docket No. 50-83), rated at 100 kilowatts are not considered tank or pool reactors.

[5] The two facilities are Massachusetts Institute of Technology (MIT) (Docket No. 50-20) and the University of California-Davis (Docket No. 50-607).

provide cooling for a limited period of time after reactor shutdown. This period of time is dependent on the recent operational history of the reactor, which determines the decay heat present at reactor shutdown. After this relatively brief time, air cooling is adequate to remove decay heat even without the ECCS. Additionally, working order of the ECCS is ensured through required surveillance and testing on the system at these facilities. Operation is not permitted if the ECCS has not been verified operational prior to reactor startup or if the system is deemed non-operational during reactor operation. In the unlikely event that the ECCS is not available after an operational history that would require ECCS, core damage will not occur if the core is uncovered as long as a small amount of cooling flow is directed to the core, which is available from multiple sources.

Because of the inherent low risk posed by these NPUFs, the NRC staff has concluded that the proposed action to eliminate license terms for NPUFs licensed under § 50.21(a) or (c), other than testing facilities, would not increase the potential for environmental impacts.

Aging. NPUFs licensed under § 50.21(a) or (c), other than testing facilities, are simple in their design and operation and therefore, the scope of aging-related concerns is limited. The NRC staff has found no significant aging issues that need evaluation at the time of license renewal because the NRC currently imposes aging-related surveillance requirements on NPUFs via technical specifications. Specifically, over the past 60 years, the NRC staff has determined that for NPUFs there are two main areas related to aging that need surveillance because of potential safety concerns: 1) fuel cladding and 2) instrumentation and control features.

With regard to fuel cladding, the NRC currently requires NPUFs to perform periodic fuel inspections. Through years of operational experience, the NRC staff has found that fuel failures either do not occur or do not release significant amounts of fission products and are quickly detected by existing monitoring systems and surveillances. If

fuel failures are detected, licensees are able to take the facility out of service without delay and remove any failed assemblies from service.

With regard to instrumentation and control, the NRC staff has found that failures in this area result in automatic facility shutdown. Failures reveal themselves to the licensee and do not prevent safe shutdown. Over the past 60 years of operation of these facilities, the potential occurrence of age-related degradation has been successfully mitigated through inspection, surveillance, monitoring, trending, recordkeeping, replacement, and refurbishment. In addition, licensees are required to report preventive and corrective maintenance activities in their annual reports, which are reviewed by the NRC. This allows the NRC to identify new aging issues if they occur. Therefore, the NRC staff has concluded that existing requirements and facility design and operational features address concerns over aging-related issues during a non-expiring license term.

Additionally, the design bases of these facilities evolve slowly over time. The NRC receives approximately five license amendment requests from all NPUF licensees combined each year. Further, on average, each of these licensees only reports five § 50.59 evaluations per year for changes to its facility that do not require prior NRC approval. Lastly, changes to regulations that would impact the licensing bases of power reactor facility operations rarely apply to NPUFs. Therefore, the NRC staff has concluded that existing surveillance requirements and facility design and operational features eliminate concerns over aging-related environmental impacts during a non-expiring license term.

Although the proposed action would eliminate the opportunity to conduct an EA at the time of license renewal for NPUFs licensed under § 50.21(a) or (c), other than testing facilities, the NRC would be able to invoke § 51.41, “Requirement to submit environmental information,” if

an environmental concern develops that requires that the licensee request a license amendment.

The proposed action does not change the requirements for applicants for new licenses and therefore, any new NPUF license applications would be required to undergo a thorough environmental review culminating in the preparation of an EA or EIS, as appropriate. However, the proposed action would add § 51.56 to provide a regulatory basis for the NRC to require environmental information from NPUF applicants. Specifically, the section would clarify an applicant's existing requirements for meeting the provisions of § 51.45 for applicants seeking a license to construct or operate an NPUF, or seeking to renew an existing license (for NPUFs licensed under § 50.22). This change improves consistency throughout part 51 with respect to environmental report submissions required for applicants seeking licensing actions. The inclusion of clear and consistent regulatory requirements for applicants would help to ensure that the NRC effectively and efficiently meets its environmental review requirements consistent with NEPA and the NRC's regulations for implementing NEPA as codified in part 51. While proposed § 51.56 does not have any direct environmental impact, its requirements advance safety and keep relevant parties informed of changes.

In summary, the NRC staff has concluded that there would be no significant environmental impacts associated with implementation of the proposed action for the following reasons:

1) The proposed requirements to eliminate license terms for NPUFs, other than testing facilities, licensed under § 50.21(a) or (c) would result in no additional radiological or non-radiological impacts because of the existing surveillance, reporting, and oversight and the minimal accident consequences of these facilities.
2) The implementation of the proposed action would not affect the NEPA environmental review requirements for new facilities and facilities applying for and still subject to license renewal.

3) The proposed accident dose criterion for NPUFs, other than testing facilities subject to part 100, would result in no additional radiological or non-radiological impacts because the new accident dose criterion specified in proposed § 50.34(a)(1)(ii)(D)(2) aligns with the early phase protective action guides published by the Environmental Protection Agency and provides reasonable assurance of adequate protection of the public from unnecessary exposure to radiation.

The principal effect of this action would be to streamline the NPUF license renewal process and to require more frequent updates to FSARs. The proposed action also would establish an accident dose criterion for NPUFs and would clarify existing requirements consistent with the rulemaking objectives discussed previously. As none of the revisions would affect current occupational exposure requirements, the NRC staff has concluded that this action would have no incremental impact on occupational exposure.

The action would neither significantly increase the probability or consequences of accidents nor result in changes in the types of effluents that may be released offsite. As a result, there would be no changes in occupational or public radiation exposure.

Given that the proposed action does not involve any change in the operation of any NPUFs, and considering the minimal heat load they dissipate to the environment, the NRC staff concludes that the proposed action would not have a significant non-radiological impact on the environment.

Accordingly, the NRC staff concludes that there would be no significant environmental impact associated with the proposed action.

Alternatives to the Proposed Action:

The NRC considered four options to fulfill the need for action: a no-action alternative (Option 1), two rulemaking alternatives (Options 2 and 3), and a non-rulemaking alternative (Option 4). The NRC staff's preferred option is Option 3.

The no-action alternative would not change the existing license terms or renewal process as described in current regulations and guidance, and therefore, would not incorporate any lessons learned from previous license renewal application reviews and would fail to satisfy the NRC's objectives and Commission direction to "establish a more efficient, effective and focused regulatory framework."

Under Option 2, the NRC would undergo a rulemaking to require FSAR updates and to revise the timely renewal provision. This option would require a licensee to submit an updated FSAR every five years to ensure that a licensee's licensing basis is kept current. Option 2 would also extend the timely renewal provision to two years ahead of license expiration for facilities licensed under § 50.22 and testing facilities licensed under § 50.21(c), so that the NRC has an adequate amount of time to conduct a thorough acceptance review of the license renewal application. The current regulatory framework of 30 days is not sufficient for the NRC to complete a comprehensive acceptance review. Additional time would streamline the overall license renewal process by addressing the adequacy of an application prior to addressing the technical content of the application. However, Option 2 would maintain the current license renewal process for all NPUFs, which would continue to impose significant burden on licensees and the NRC.

Option 3 is a rulemaking to require FSAR updates, revise the timely renewal provision for testing facilities and NPUFs licensed under § 50.22, and eliminate license terms for NPUFs, other than testing facilities, licensed under § 50.21(a) or (c). All NPUFs would be required to submit FSAR updates every five years. Option 3 is expected to reduce the burden on NPUFs, other than testing facilities, licensed under § 50.21(a) or (c) by forgoing the license renewal process. Option 3 would address all of the NRC's regulatory objectives by streamlining the license renewal process.

Non-rulemaking alternatives, such as issuing a new regulatory guide and updating NUREG-1537, were considered under Option 4. However, non-rulemaking approaches would

not be responsive to the Commission's direction to "establish a more efficient, effective and focused regulatory framework." As a result, non-rulemaking alternatives cannot achieve the NRC's objectives.

Alternative Use of Resources:

The proposed action would not involve the use of any resources not previously considered by the NRC in past environmental documents, statements for issuance of operating licenses, or license renewals for the facilities that would be affected by this action. The NRC staff has determined that there are no irreversible commitments of resources associated with the proposed action.

Agencies and Persons Consulted:

The NRC developed the proposed rule and this EA. In accordance with its stated policy, the NRC provided a copy of the proposed rule to designated liaison officials for each state. No other agencies were consulted.

DRAFT FINDING OF NO SIGNIFICANT IMPACT

The NRC has prepared this draft EA as part of its review of the proposed action. On the basis of this draft EA, the NRC staff finds that there are no significant environmental impacts from implementation of the proposed action because the proposed action would not entail any changes in the operation of any NPUFs. This finding is based upon NPUF operating experience over the past 60 years and the NRC's experience reviewing license renewal applications over the past 40 years. Therefore, the NRC staff concludes that the proposed action would not have a significant effect on the quality of the human environment and that the preparation of an EIS is not warranted. Accordingly, the NRC staff has determined that this draft finding of no significant impact is appropriate. A final determination to prepare either an EIS or a final finding of no significant impact will be made after the proposed rule's public comment period expires.

Documents 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 20852. You may obtain publicly-available documents online in the ADAMS Public Documents collection at http://www.nrc.gov/reading-rm/adams.html.

Dated at Rockville, Maryland, this 30 th day of March, 2017.

For the Nuclear Regulatory Commission.

/RA/

Louise Lund, Director
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

SUBJECT: ENVIRONMENTAL ASSESSMENT SUPPORTING PROPOSED RULE:
NON-POWER PRODUCTION OR UTILIZATION FACILITY LICENSE RENEWAL
(RIN-3150-AI96, NRC-2011-0087)
DATED: March 30, 2017

ADAMS ACCESSION Nos.: Pkg: ML15323A048 EA: ML15323A060 WITS: 200900140 *Via E-Mail

OFFICE	NRR/DPR/PRMB: PM	NRR/DPR/PRLB: PM*	NRR/DPR/PRMB: RS*	NRR/DPR/PRMB: BC*	NRR/DPR/PRLB: BC*
NAME	RBeall	DHardesty	GLappert	TInverso	AAdams
DATE	12/03/15	12/08/15	12/03/15	12/03/15	12/07/15
OFFICE	NRR/DPR: DD*	NRR/DPR: D	NRR/DRA:D*	NRR/DLR:D*	NRR/DIRS:D*
NAME	MGavrilas	LKokajko	JGiitter	CMiller	SMorris (AHowe for)
DATE	12/28/15	01/11/2016	12/14/15	12/15/15	12/15/15
OFFICE	RES/DE: D*	NMSS/DUWP/RDB: BC*	ADM/DAS/RADB: BC*	OCIO/CSD/FPIB: BC*	OGC (NLO)*
NAME	BThomas	BWatson (TSmith for)	CBladey (DForder for)	KMorgan-Butler (KBenney for)	HBenowitz
DATE	02/01/16	01/29/16	02/17/16	01/28/16	03/04/16
OFFICE	NRR:D	EDO	NRR/DPR: D		
NAME	WDean	VMcCree (MJohnson for)	LLund		
DATE	04/01/16	04/06/16	3/30/2017		

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Regulatory Analysis and Backfit Considerations

Non-power Production or Utilization Facility License Renewal

U.S. Nuclear Regulatory Commission

March 2017

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Abbreviations

AEA	Atomic Energy Act of 1954, as amended
ADAMS	Agencywide Documents Access and Management System
BLS	Bureau of Labor Statistics
CFR	Code of Federal Regulations
CRGR	Committee to Review Generic Requirements
DOE	U.S. Department of Energy
FSAR	final safety analysis report
GE	General Electric
HEU	high-enriched uranium
ISG	Interim Staff Guidance
kW	kilowatt
LOE	level of effort
NEPA	National Environmental Policy Act
NIST	National Institute of Standards and Technology
NRC	U.S. Nuclear Regulatory Commission
NPUF	non-power production or utilization facility
PM	project manager
RAI	request for additional information
RTR	research and test reactor
SHINE	SHINE Medical Technologies, Inc.

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Executive Summary

The U.S. Nuclear Regulatory Commission (NRC) is proposing to amend its regulations in title 10 of the *Code of Federal Regulations* (10 CFR) that govern the license renewal process for non-power reactors, testing facilities, and other production or utilization facilities, licensed under the authority of Section 103, Section 104a, or Section 104c of the Atomic Energy Act of 1954, as amended (AEA), that are not nuclear power reactors. In this proposed rule, the NRC collectively refers to these facilities as non-power production or utilization facilities (NPUFs). The proposed rulemaking would amend 10 CFR parts 2, 50, and 51 to: 1) create a definition for "non-power production or utilization facility," or "NPUF"; 2) eliminate license terms for facilities, other than testing facilities, licensed under 10 CFR 50.21(a) or (c); 3) define the license renewal process for testing facilities licensed under § 50.21(c) and NPUFs licensed under 10 CFR 50.22; 4) require all NPUF licensees to submit final safety analysis report (FSAR) updates to the NRC every five years; 5) amend the current timely renewal provision under 10 CFR 2.109, allowing NPUFs to continue operating under an existing license past its expiration date if the facility submits a license renewal application at least two years before the current license expiration date; 6) provide an accident dose criterion of 1 rem (0.01 Sieverts (Sv)) total effective dose equivalent (TEDE) for NPUFs, other than testing facilities; 7) extend the applicability of 10 CFR 50.59 to NPUFs regardless of their decommissioning status; 8) clarify an applicant's requirements for meeting the existing provisions of 10 CFR 51.45; and 9) eliminate the requirement under 10 CFR 50.33(f)(2) to submit financial qualification information with NPUF license renewal applications.

The analysis presented in this document examines the benefits and costs of the proposed rulemaking and implementing guidance relative to the baseline case (i.e., the no action alternative).

The key findings are as follows:

- Proposed Rule Analysis – Costs. As a result of the proposed rule and implementing guidance, the NRC estimates that NPUFs would incur a total one-time implementation cost of $140,000, followed by total operations costs of $1.6 million over the 20-year analysis period ($1.2 million using a 3 percent discount rate or $0.9 million using a 7 percent discount rate).

  The proposed rule and implementing guidance would result in a total one-time cost to the NRC of $720,000 to complete the rulemaking (i.e., analyze public comments, hold public meeting(s), and develop the final rule and regulatory guidance) and oversee the implementation of the new NPUF license renewal requirements. This one-time cost would be followed by total operation costs of approximately $1.8 million over the 20-year analysis period ($1.4 million using a 3 percent discount rate or $1.0 million using a 7 percent discount rate).

  According to Executive Order 12866, Regulatory Planning and Overview (58 FR 190), an economically significant regulatory action is one that would have an annual effect on the economy of $100 million or more. From a cost perspective, this proposed rulemaking does not reach this threshold because the annualized cost of the proposed rule would be $230,000 using a 3 percent discount rate or $260,000 using a 7 percent discount rate.

- Benefits. In terms of the quantitative benefits associated with this proposed rulemaking, NPUFs and the NRC would receive incremental benefits from the elimination of license renewals for qualifying NPUFs (i.e., currently operating research reactors). For NPUFs, this proposed rulemaking in total would result in $5.5 million in cost savings over the 20-year period of analysis ($3.9 million using a 3 percent discount rate or $2.5 million using a 7 percent discount rate). For the NRC, this proposed rulemaking in total would result in $12 million in total cost savings over the 20-year period of analysis ($8.5 million using a 3 percent discount rate or $5.6 million using a 7 percent discount rate).

  Qualitatively, the proposed rulemaking would result in benefits associated with increased regulatory efficiency, as well as minimal benefits to public health and safety (see Section 3.4).

  From a benefits perspective, this proposed rulemaking does not reach the $100 million threshold of Executive Order 12866 because the annualized benefit of the proposed rule would be $830,000 using a 3 percent discount rate and $770,000 using a 7 percent discount rate.

  When compared to incremental costs, the proposed rulemaking would result in a total net benefit of $13 million ($8.9 million using a 3 percent discount rate or $5.3 million using a 7 percent discount rate) over the 20-year analysis period. Of the $13 million in net benefits, NPUFs are expected to receive $3.8 million ($2.5 million using a 3 percent discount rate or $1.5 million using a 7 percent discount rate) and the NRC is expected to receive $9.4 million ($6.4 million using a 3 percent discount rate or $3.8 million using a 7 percent discount rate).

- Decision Rationale. Relative to the no action baseline, the NRC concludes that the quantitative benefits justify the quantitative costs of this proposed rule and would address the inefficiencies and existing issues affecting the NPUF license renewal process.

- Backfit Considerations. The NRC's backfitting provisions for reactors are found in § 50.109. The NRC has determined that § 50.109 does not apply to NPUFs (see Appendix A). Because § 50.109 does not apply to NPUFs, and this proposed rule would apply to NPUFs, a backfit analysis was not prepared for this proposed rule.

1. Introduction

This document presents the regulatory analysis of the proposed rulemaking to streamline the NPUF license renewal process. This section is divided into two parts: Section 1.1 provides background information on the rulemaking; and Section 1.2 identifies the problems that the NRC seeks to address, as well as the objectives for the proposed rulemaking.

1.1 Background

The NRC regulates 36 NPUFs, of which 31 are currently operating. The other five regulated NPUFs are in the process of decommissioning, have possession-only licenses, or are permanently shut down. Sections 103 (for commercial or industrial purposes) and 104a and c (for medical therapy and research and development activities) of the AEA establish the NRC's authority to license NPUFs. The section of the AEA that provides licensing authority for the NRC corresponds directly to the class of license issued to a facility (i.e., Section 104a of the AEA authorizes the issuance of a class 104a license). Sections 104a and c of the AEA require that the Commission impose only the minimum amount of regulation needed to promote common defense and security, protect the health and safety of the public, and permit, under Section 104a, the widest amount of effective medical therapy possible and, under Section 104c, widespread and diverse research and development.

As part of its oversight of NPUFs, the NRC administers an initial licensing process, followed by a license renewal process for those NPUFs that seek to continue operating beyond their initial license term. In 2008, the NRC identified a need to identify and implement efficiencies in the NPUF license renewal process to streamline the process while ensuring that adequate protection of public health and safety is maintained. This need for improvement in the reliability and efficiency of the process was primarily driven by four issues:

1. Following the terrorist attacks of September 11, 2001, NRC staffing priorities were redirected from processing license renewal applications to addressing security initiatives identified following the attacks. In addition, the NRC was focused on implementing 10 CFR 50.64 to convert NPUF licensees to the use of low-enriched uranium.

2. Most NPUFs have limited staff and resources available to execute the steps of the license renewal process. The number of staff available to address the license renewal steps and requirements can range from only one part-time employee at small low-power NPUFs, to as many as four or five full-time employees at large high-power NPUFs. Because the NPUF staff that execute the licensing renewal steps do so in addition to their normal site responsibilities, there are often delays (particularly in responding to requests for additional information (RAI)) in the license renewal process.

3. Many NPUFs have inconsistent existing license infrastructure, which was reflected in license renewal applications. For many NPUFs, the decades between license renewals (and the accompanying FSAR submissions) result in license renewal applications that may be lacking in completeness and accuracy. The incompleteness and inaccuracy of NPUF applications often result in increased time and effort on the part of NRC and NPUF staff to address issues in applications, contributing to the backlog.

4. For power reactors, license renewal reviews have a defined scope, primarily focused on aging management, as described in 10 CFR part 54. For NPUFs, there are not explicit requirements on the content to be addressed during license renewal. Therefore, the scope of review for license renewal is the same as that for an original license. In addition, in response to Commission direction in the Staff Requirements Memorandum (SRM) to SECY-91-061, "Separation of Non-Reactor and Non-Power Reactor Licensing Activities from Power Reactor Licensing Activities in 10 CFR Part 50," the NRC developed licensing guidance for the first time since NPUF applicants were originally licensed (Ref. 1). In that guidance (NUREG-1537, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors" (Ref. 2)), the NRC provides detailed descriptions of the scope, content, and format of FSARs and the NRC's process for reviewing initial license applications and license renewal applications. However, at the time of the first license renewals using NUREG-1537, some licensees did not follow the guidance applicable to license renewal applications, nor did they propose an acceptable alternative to the guidance.

Once a backlog of NPUF license renewal applications developed and persisted, the NRC and other stakeholders voiced concerns not only about the backlog, but also about the burdensome nature of the license renewal process itself. The Commission issued SRM-M080317B in April 2008, which directed the NRC staff to examine the license renewal process for NPUFs and identify and implement efficiencies to streamline this process while ensuring adequate protection of the public (Ref. 3).

The NRC staff provided the Commission with plans to improve the review of NPUF license renewal applications in SECY-08-0161, "Review of Research and Test Reactor License Renewal Applications" in October 2008 (Ref. 4). In SECY-08-0161, the NRC staff discussed a public meeting held with stakeholders to gather feedback on the current process, ways it could be improved, and the options the NRC staff was considering for improving the review process. The Commission issued SRM-SECY-08-0161 in March 2009, which instructed the NRC staff to develop program initiatives to address the backlog of existing NPUF license renewal applications (Ref. 5). In addition, the Commission directed the NRC staff to submit a long-term plan for an enhanced NPUF license renewal process. The Commission requested that the plan include development of a basis for redefining the scope of the license renewal process as well as a recommendation regarding the need for rulemaking and guidance development.

The NRC staff issued SECY-09-0095 in June 2009 to provide the Commission with a long-term plan for enhancing the NPUF license renewal process (Ref. 6). In the long-term plan, the NRC staff proposed to develop a draft regulatory basis to support proceeding with rulemaking to streamline and enhance the NPUF license renewal process. The Commission issued SRM-M090811, "Staff Requirements Memorandum – Briefing on Research and Test Reactor (RTR) Challenges" in August 2009, which directed the NRC staff to accelerate the rulemaking to establish a more efficient, effective and focused regulatory framework for NPUF license renewal (Ref. 7).

The NRC staff completed the regulatory basis in August 2012 (Ref. 8). The regulatory basis analyzed the technical, legal, and policy issues; impacts on public health, safety, and security; impacts on licensees; impacts on the NRC; stakeholder feedback; as well as other considerations, and concluded that a rulemaking was warranted.

1.2 Statement of the Problem and Nuclear Regulatory Commission Objectives for the Rulemaking

The NRC has developed this proposed rulemaking in order to address gaps and issues in current regulations. With regard to NPUFs, the Commission directed the NRC staff to develop a streamlined license renewal process for NPUFs. Following the Commission's directive, the NRC staff identified four areas of concern regarding the current license renewal process, which need to be addressed in order to develop a streamlined process. These four areas are: (1) the current reliance on initial licensing regulations for license renewal; (2) the lack of periodic updates to the FSAR; (3) the constraints related to the current "timely renewal" provision in 10 CFR 2.109; and (4) other issues in the existing rule language. The proposed rulemaking would include the following provisions to address these areas of concern:

- Create a definition for "non-power production or utilization facility," or "NPUF." The NRC is proposing to add a specific definition for "non-power production or utilization facility" to 10 CFR 50.2 to establish a term that is flexible in order to capture all non-power facilities licensed under § 50.22 or § 50.21(a) or (c), including medical radioisotope irradiation and processing facilities and research reactors and testing facilities. While these licensees are currently subject to existing regulations, a more inclusive definition would alleviate any ambiguity surrounding applicability for new licensees. This administrative change would not impose any additional cost and is further discussed in Section 3.3. The proposed rule also would make conforming changes in other sections to refer to this new definition.

- Eliminate license terms for facilities, other than testing facilities, licensed under 10 CFR 50.21(a) or (c). By issuing non-expiring licenses for facilities, other than testing facilities, licensed under § 50.21(a) or (c), the NRC would reduce the burden on qualifying NPUFs (i.e., currently operating research reactors), while continuing to protect public health and safety, promote common defense and security, and protect the environment through regular, existing oversight activities, and the proposed addition of routine FSAR update submittals. The proposed rule also would make conforming changes to the termination of license requirements in § 50.82(b) and (c), where license expiration is used as a reference point. The NRC proposes to issue orders following the publication of the final rule to remove license terms from each license. In addition, the orders would establish when the respective licensee's initial FSAR update would be due to the NRC.

- Define the license renewal process for testing facilities and NPUFs licensed under 10 CFR 50.22. By defining a license renewal process in proposed § 50.135 specific to NPUFs with licenses issued under § 50.22 and testing facilities licensed under § 50.21(c), the NRC would consolidate existing requirements for current and future licensees in one section.

- Require all NPUF licensees to submit FSAR updates to the NRC every five years. By requiring periodic updates to the FSAR, the NRC anticipates that licensees would document changes in licensing bases as they occur, which would maintain the continuity of knowledge both for the licensee and the NRC and the understanding of changes and effects of changes on the facility. From a safety perspective, an updated FSAR is important for the NRC's inspection program and for effective licensee operator training

and examinations. The updated FSAR submittals also would enhance the NRC's continuous oversight of facilities during their operation while imposing a minimal amount of regulation needed to promote common defense and security, protect the health and safety of the public, and permit widespread and diverse research and development and the widest possible amount of effective medical therapy.

- Amend the current timely renewal provision under 10 CFR 2.109, allowing NPUF facilities to continue operating under an existing license past its expiration date if the facility submits a license renewal application at least two years before the current license expiration date. Under the proposed rule, if an NPUF subject to license renewal (i.e., licensed under § 50.22 or a testing facility licensed under § 50.21(c)) files a sufficient application for license renewal at least two years (rather than the current 30 days) before the expiration of the existing license, then the existing license would not be deemed to have expired until the application has been finally determined by the NRC. The proposed revision would ensure that the NRC has adequate time to review the sufficiency of NPUF license renewal applications while the facility continues to operate under the terms of its current license.

- Provide an accident dose criterion of 1 rem (0.01 Sv) TEDE for NPUFs other than testing facilities. Currently, the NRC applies the standards in 10 CFR part 20 to NPUFs, other than testing facilities, as the accident dose criteria. More specific dose criteria in accident analyses for NPUFs, other than those NPUFs subject to 10 CFR part 100, are needed. Because of NPUFs' low potential radiological risk to the environment and the public, the part 20 public dose limits are unnecessarily restrictive as applied to accident consequences, such as the maximum hypothetical accidents (MHAs), considered in NPUF license renewal applications.[1] The NRC is proposing to amend its regulations in § 50.34 to add accident dose criterion for NPUFs not subject to part 100. The addition of an accident dose criterion for NPUFs would not require any changes to current licensee practices and, therefore would not result in any incremental costs.

- Extend the applicability of 10 CFR 50.59 to NPUFs regardless of their decommissioning status. The proposed rule would revise the wording of § 50.59(b) which currently does not apply § 50.59 to NPUFs whose licenses have been amended to cease operations and no longer have fuel onsite (e.g., have returned all of their fuel to the U.S. Department of Energy [DOE]). For licensees that had fuel removed from their site, the NRC must add license conditions identical to those of § 50.59 to allow the licensee to make changes in their facility or changes in their procedures, that would not otherwise require obtaining a license amendment pursuant to § 50.90. The license amendment process imposes an administrative burden on the licensees and the NRC, which could be eliminated with the proposed regulatory change.

- Clarify an applicant's requirements for meeting the existing provisions of 10 CFR 51.45. This change would clarify an applicant's requirements for meeting the existing provisions of § 51.45 and improve consistency throughout 10 CFR part 51 with respect to environmental report submissions required by applicants for licensing actions. The proposed regulatory requirements would help to ensure that the NRC effectively and

[1] The NRC Atomic Safety and Licensing Appeal Board has suggested that the standards in part 20 are unduly restrictive as accident dose criteria for research reactors.

efficiently meets its environmental review requirements consistent with the National Environmental Policy Act (NEPA) and the NRC's regulations for implementing NEPA.

- Eliminate the requirement for NPUFs to submit financial qualification information with license renewal applications under 10 CFR 50.33(f)(2). The basis on which the NRC has relied to reduce or eliminate financial qualification requirements for power reactor licensees, supported by the NRC's NPUF inspection and enforcement programs, can similarly be applied as a basis for eliminating NPUF license renewal financial qualification requirements.

2. Identification and Preliminary Analysis of Alternative Approaches

In addition to the proposed rule (identified as Option 3), the NRC has identified three alternatives for consideration.

- Option 1: Take No Action [Not Selected].
- Option 2: Undertake Rulemaking to Require Final Safety Analysis Report Updates and Revise the Timely Renewal Provision [Not Selected].
- Option 3: Undertake Rulemaking to Require Final Safety Analysis Report Updates, Revise the Timely Renewal Provision, and Eliminate License Terms for Class 104a or c Licensees, Other than Testing Facilities [Selected – Proposed Rule].
- Option 4: No Rulemaking for License Renewal. Issue a New Regulatory Guide and Update NUREG-1537 (Ref. 2) to Incorporate a Streamlined License Renewal Process [Not Selected].

2.1 Option 1: Take No Action [Not Selected]

Under Option 1 (not selected), the NRC would not change existing license terms or the license renewal process, as described in current regulations and guidance. This alternative serves as the baseline against which the impacts of the other identified alternatives are measured.

This option would pose no incremental burden on licensees or on the NRC. However, under this option, the NRC staff would not be responsive to the Commission's direction in SRM-M080317B (Ref. 3). Stakeholders voiced opposition to the status quo during the December 19, 2011, public meeting because it would not incorporate lessons learned from the recent round of NPUF license renewal application reviews. As a result, this option would not achieve the NRC's objectives.

2.2 Option 2: Undertake Rulemaking to Require Final Safety Analysis Report Updates and Revise the Timely Renewal Provision [Not Selected]

Under Option 2 (not selected), the NRC would revise its regulations to require all NPUFs to submit (1) license renewal applications two years in advance of license expiration (rather than the current 30 days) and (2) updated FSARs to the NRC every five years.

The current timely renewal provision in 10 CFR 2.109(a) allows an NPUF licensee to continue operation as long as it has submitted its license renewal application prior to 30 days before the expiration of its existing license. Generally, the NRC has found that 30 days does not provide an adequate amount of time for a thorough acceptance review of the license renewal application. As a result, the license renewal process is prolonged because additional time is needed to address deficiencies in the application that could have been identified before accepting the application for official review. Under this option, § 2.109(a) would be modified to require NPUFs to submit their license renewal applications two years (rather than the current 30 days) before their license is set to expire. This would grant the NRC time to thoroughly review an application and address any issues regarding missing elements without having to prolong the full review of the license renewal application.

This option also would require licensees to submit updated FSARs to the NRC. Under current regulations, licensees are not required to submit updated FSARs on a periodic basis. During the most recent round of license renewal, the NRC found that some licensees lost their licensing bases because licensees had not reflected decades of changes to the facilities in their FSARs. As a result, licensees had to reconstitute their licensing bases through the license renewal process. The reconstitution of licensing bases added burden on both licensees and the NRC and prolonged the license renewal process. This option would require that licensees submit updates to their FSARs to the NRC every five years. This submittal would certify that licensees, over time, include any operational or design changes in their FSARs, ensuring that their licensing basis is kept current and that the NRC is kept aware of any modifications.

The NRC expects that this option would reduce the burden of the license renewal process on licensees and the NRC because of the following:

(1) The current regulatory framework of 30 days is not sufficient for the NRC to complete a comprehensive acceptance review. Additional time would streamline the overall license renewal process by addressing the adequacy of an application prior to addressing the technical content of the application. This would result in a decreased burden to the NRC and licensees and would create efficiencies in the license renewal process.

(2) Requiring licensees to submit an updated FSAR every five years would compel licensees to integrate any changes to their facility operations and design into their licensing basis as they occur, ensuring that their licensing basis remains up to date. Therefore, the burden on the NRC and licensees associated with reconstituting each licensee's licensing basis during license renewal could be avoided, resulting in decreased burden and increased efficiency for both parties.

Although this option would provide some streamlining to the license renewal process by allowing additional time for acceptance reviews and requiring more frequent submittals of FSAR

updates, all NPUF licensees would still have to go through a license renewal application process, which would continue to impose burden on these licensees. The costs imposed by this option are outlined in Section 3.3. Even though this option would result in some efficiencies, this option is not cost-beneficial.

2.3 Option 3: Undertake Rulemaking to Require Final Safety Analysis Report Updates, Revise the Timely Renewal Provision, and Eliminate License Terms for Class 104a or c Licensees, Other than Testing Facilities [Selected – Proposed Rule]

Under Option 3 (the proposed rule), the NRC would eliminate license terms for class 104a or c licensees (i.e., facilities licensed under 10 CFR 50.21(a) or (c)), other than testing facilities. As a result, these licensees would not be subject to a license renewal process. However, in order to ensure that these NPUFs continue to operate safely, this option would implement additional provisions for licensees and the NRC. Further, under this option, the NRC would define a license renewal process for class 103 licensees and testing facilities in proposed § 50.135, consolidating existing requirements for current and future licensees in one section.

For class 104a or c licensees, other than testing facilities, this option would eliminate license terms and require licensees to submit updated FSARs every five years. This requirement would certify that licensees reflect operational or design changes in their FSARs over time, ensuring that their licensing basis is kept current.

For class 103 licensees and testing facilities, this option would still require licensees to submit a license renewal application at the end of their license term to keep operating. But this option also would include the streamlining features described under Option 2 (not selected) (modify the timely renewal provision in 10 CFR 2.109 and require licensees to submit updated FSARs every five years).

This option would eliminate the burden associated with the license renewal process for all but one of the currently licensed NPUFs. This large reduction in burden would be slightly offset by the minimal burden associated with submitting FSARs to the NRC on an ongoing basis.

This option would establish an overall streamlined approach to license renewal that would result in a net burden reduction for both licensees and the NRC without sacrificing safety. Therefore, Option 3 would best address the NRC's regulatory objectives and is the proposed rule option.

2.4 Option 4: Non-rulemaking Alternatives [Not Selected]

The NRC considered other, non-rulemaking approaches, such as issuing a new regulatory guide and updating NUREG-1537 (Ref. 2) to include a streamlined license renewal process. Under Option 4 (not selected) the NRC would update NUREG-1537 to include lessons learned from the license renewal process, including lessons learned from application of the "Interim Staff Guidance on the Streamlined Review Process for License Renewal for Research Reactors" (ISG) (Ref. 10). Although this option would update NUREG-1537 to incorporate lessons learned from past license renewals, these changes would be made to guidance documents and would not have the force of a regulation. As a result, licensees would not have to comply with the changes, and there may be no ensuing benefit.

Although this option could result in increased efficiency for licensees and NRC due to the incorporation of lessons learned, this option does not fully address any of the issues that formed the basis of the Commission's direction and the NRC staff's objectives. Specifically, this option would not address the issue of the lack of regulations specific to the license renewal process for NPUFs. Further, this option would not address the issues associated with the current timely renewal provision. Moreover, because this option and other non-rulemaking approaches do not carry the force of a regulatory action and any provisions would, therefore, be voluntary, they would not achieve the broad applicability of a rulemaking.

3. Estimation and Evaluation of Benefits and Costs: Presentation of Results

This section details the NRC's approach to estimating the costs and benefits of the proposed rule, and presents the results of the analysis:

- Section 3.1 details the methodology, assumptions, and baseline used to evaluate the costs and benefits associated with the options considered in the regulatory analysis.
- Section 3.2 summarizes the costs and benefits associated with the options.
- Section 3.3 presents the details of the costs associated with the proposed rule.
- Section 3.4 discusses the benefits of the proposed rule.
- Section 3.5 provides a discussion of the disaggregated results.
- Section 3.6 discusses the uncertainty analysis.

3.1 Methodology and Assumptions

This section explains the process used to evaluate the costs and benefits associated with the rulemaking options, consistent with the guidance provided in NUREG/BR-0058, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission" (Ref. 11). The benefits include desirable changes in affected attributes (e.g., monetary savings, improved safety, reduced burden on licensees, streamlined process), while the costs include any undesirable changes in affected attributes (e.g., monetary costs).

The NRC estimated the costs and benefits of the proposed rule as incremental costs and benefits as compared to a "no action" baseline. The no action baseline includes the historical costs incurred by NPUFs and the NRC during the license renewal process. The NRC estimated all of the incremental costs and benefits resulting from the proposed requirements that would be incurred beginning in 2019, which is the year the final rule is assumed to come into effect. All costs and benefits presented in this analysis are in 2016 dollars.[2]

Affected Universe

The regulatory option under consideration would affect all NPUFs. The costs and benefits affecting individual facilities, however, differ depending on various characteristics (e.g., power level of the NPUF, type of staff employed, and date of last license renewal).

The NRC estimated the costs and benefits incurred by the 31 currently operating NPUFs. Incremental costs and benefits to the other five regulated NPUFs that are in the process of

[2] Where appropriate, values were scaled to 2016 dollars using projections of the consumer price index from Statista (available online at: http://www.statista.com/statistics/244993/projected-consumer-price-index-in-the-united-states/).

decommissioning, have possession-only licenses, or are permanently shut down are not considered in the regulatory analysis. Appendix B details the cost and savings buildup.

For the purposes of estimating the costs and benefits of the proposed rule, the 31 NPUFs included in the analysis are broken into three categories based on the power of the facility: Low (<100 kilowatt (kW)), Medium (≥100 and <1000 kW), and High (≥ 1000 kW). There are five facilities in the Low category, 11 in the Medium category, and 15 facilities in the High category. These divisions allow for the estimation of regulatory compliance costs and savings that differ based on the size and power level of the different facilities. Exhibit 3-1 lists the NPUFs included in the universe of affected entities under this analysis, by category.

Exhibit 3-1. List of NPUFs by Power Level

Low (<100 kW)	Medium (≥100 and <1000 kW)	High (≥ 1000 kW)
Idaho State University	Aerotest*	Armed Forces Radiobiology Research Institute
Purdue University	Dow Chemical Company	Massachusetts Institute of Technology
Rensselaer Polytechnic Institute	GE-Hitachi	National Institute of Standards and Technology (NIST)**
Texas A&M University (AGN)	Kansas State University	North Carolina State University
University of New Mexico	Missouri University of Science and Technology	Oregon State University
	Ohio State University	Pennsylvania State University
	Reed College	Rhode Island Atomic Energy Commission
	University of California (Irvine)	Texas A&M University (TRIGA)
	University of Florida	U.S. Geological Survey
	University of Maryland	University of California (Davis)
	University of Utah	University of Massachusetts (Lowell)
		University of Missouri (Columbia)
		University of Texas
		University of Wisconsin
		Washington State University
5 Facilities	**11 Facilities**	**15 Facilities**

Source: NRC Information Digest, 2015-2016 (NUREG-1350, Vol. 27) Appendix J: http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1350/

*Aerotest is currently shut down, but is included here only for purposes of the regulatory analysis. The Commission has made no determination whether the facility will continue operations by the effective date of the rule.

**NIST has specific requirements discussed in Section 3.2 below.

As described in the *Federal Register* notice, the 31 NPUFs are separated into different groups that will dictate when the licensee's initial FSAR update would be due to the NRC. These groupings also vary the time that different costs and benefits are incurred across the analysis period. Group 1 consists of licensees that completed the license renewal process using the ISG. Group 2 consists of licenses that last completed license renewal prior to the issuance of the ISG (i.e., license renewal was reviewed per NUREG-1537, Part 2). Group 3 would consist of the remaining NPUF licensees, each of which would need to submit a license renewal

application consistent with the format and content guidance in NUREG-1537, Part 1. The staff will review the application per NUREG-1537, Part 2 using the ISG. Exhibit 3-2 details the different groupings.

Exhibit 3-2. List of NPUFs by License Renewal Period

Group 1	Group 2	Group 3
Armed Forces Radiobiology Research Institute	Idaho State University	Aerotest*
Dow Chemical Company	Kansas State University	GE-Hitachi
Purdue University	Massachusetts Institute of Technology	North Carolina State University
Reed College	Missouri University of Science and Technology	University of California (Davis)
Rhode Island Atomic Energy Commission	NIST**	
Texas A&M University (AGN)	Ohio State University	
Texas A&M University (TRIGA)	Oregon State University	
U.S. Geological Survey	Pennsylvania State University	
University of California (Irvine)	Rensselaer Polytechnic Institute	
University of Florida	University of New Mexico	
University of Maryland	University of Utah	
University of Massachusetts (Lowell)	University of Wisconsin	
University of Missouri (Columbia)	Washington State University	
University of Texas		
14 Facilities	**13 Facilities**	**4 Facilities**

*Aerotest is currently shut down, but is included here only for the purposes of the regulatory analysis. The Commission has made no determination whether the facility will continue operations by the effective date of the rule.
**NIST has specific requirements discussed in Section 3.2 below.

Cost Estimation

In order to estimate the costs associated with the proposed rule, the NRC used a work breakdown approach to deconstruct the proposed rule requirements according to the required activities for each requirement. For each required activity, the NRC further subdivided the work across labor categories (i.e., Professor, Operator, Technician, Student, and Administrator). The NRC estimated the required level of effort (LOE) for each labor category and for each required activity in order to develop bottoms-up cost estimates.

The NRC gathered data from several sources and consulted licensees to develop LOE and unit cost estimates. Mean hourly wage rates for various labor categories were derived from Bureau of Labor Statistics (BLS) 2014 Occupational Employment and Wages data and scaled to 2016 dollars (see footnote 1 in Section 3.1). As per NUREG/CR-4627, "Generic Cost Estimates," direct wage rates are loaded using a multiplier of two to account for licensee and contractor labor and overhead (i.e., fringe, benefits, general administration, and profit) (Ref. 12). Exhibit 3-3 presents the mean wage rates, loaded wage factor, and loaded wage rates used throughout this analysis.

Exhibit 3-3. Wage Rate Estimates by Labor Category (2016$)

Labor Category	Mean Wage Rate	Loaded Wage Factor	Loaded Wage Rate
	A	B	C = A x B
Reactor Director, Engineering Professor	$49.81	2	$99.63
NPUF Operator, Assistant Director	$40.18		$80.36
Nuclear Technician	$37.10		$74.19
Graduate Teaching Assistant	$16.08		$32.16
Administrator Education, Post-Secondary	$49.77		$99.54
NRC Staff			$129.90

NOTE: The loaded wage factor was based on NUREG/CR-4627 (Ref. 12).
The mean wage rate for Engineering Professors (25-1031), Nuclear Power Reactor Operators (51-8011) henceforth NPUF Operator, Nuclear Technicians (19-4051), Graduate Teaching Assistants (25-1191), and Administrators (11-9033) were obtained from BLS data and then scaled to 2016 dollars.
The Nuclear Power Reactor Operator job category was used as a proxy for NPUF Operator based on direct licensee input.
The NRC staff loaded labor rates are estimated to be $128 per hour and are calculated based on actual labor and benefit costs from the prior fiscal year (2015) by office and grade and then scaled to 2016 dollars.

Cost Estimation Methods

The NRC applied several cost estimation methods in this analysis. The professional knowledge and judgment of the NRC staff were used to estimate many of the costs and benefits. Additionally, a build-up method, solicitation of licensee input, and extrapolation techniques were used to estimate costs and benefits.

To begin with, some activities were estimated using the engineering build-up method of cost estimation, which combined incremental costs of an activity from the bottom up to estimate a total cost. For this step, the NRC reviewed previous license applications and extracted the length of each section, in page numbers, and the NRC used these data to develop preliminary LOEs which could then be compared to licensee feedback.

The NRC consulted licensee experts within and outside of the agency to develop most of the LOE estimates used in the analysis. For example, for both cost savings and the costs of the proposed rule, the NRC consulted licensees when estimating the LOE required for the existing license application process. Additionally, the NRC staff contributed to the estimation of LOE required for inspection-related activities.

Extrapolation was used to estimate some cost activities, which relies on actual past or current costs to estimate the future cost of similar activities. For instance, to calculate the estimated costs of the existing license renewal process and the proposed rule, it was necessary for the NRC to extrapolate the labor categories responsible for the work based on limited licensee data. Where possible, the NRC relied directly on licensee input. In addition, the NRC used actual timekeeping data and contractor costs from the review of several NPUF license renewal applications and extrapolated these data to estimate the NRC cost savings per NPUF and the total averted costs. For steps in the current and proposed license renewal process with no data, however, the NRC determined the labor category and distribution of work between the labor categories based on similar steps in the process for which data are available.

To incorporate uncertainty into the model, the NRC employed Monte Carlo simulation, which is an approach to uncertainty analysis where values for input variables are expressed as

distributions defined by the analyst. The analysis was then run multiple (usually 1,000 or more) times and values were chosen at random from the distributions of the input variables. The result was a distribution of values for the output variable of interest. With Monte Carlo simulation, it is also possible to determine the input variables that have the greatest effect on the value of the output variable. See Section 3.6 for a detailed description of the Monte Carlo simulation methods and a presentation of the results.

Time Period of Analysis

To define the period of analysis covered by this regulatory analysis (i.e., the period over which costs and benefits would be incurred), the NRC decided on a 20-year time horizon based on the current, standard 20-year license renewal term for NPUFs. By defining the period of analysis as an increment of 20, the costs and benefits of the proposed rulemaking can be easily extended to include another full round of license renewals. The 20-year analysis period for this regulatory analysis runs from 2019 (the anticipated effective date of the final rule) through 2038.

Present Value Calculations

The NRC calculated the present value of the costs and benefits (in 2016 dollars) that NPUFs would incur over the analysis period. The rule is assumed to be finalized and become effective in 2019. One-time implementation costs for both the NRC and licensees would be incurred in 2019. Beginning in 2020, a once per five-year cost per licensee (to draft and submit a revised FSAR update) will be incurred by the licensee, as well as a cost incurred by the NRC to review the submittal. As discussed previously, licensees were separated into three distinct groupings according to their current license status (shown in Exhibit 3-2). These groups will have a staggered FSAR update submittal schedule to prevent a backlog of FSAR update submittals from occurring. These staggered updates highlight the importance of discounting on the resulting net benefit estimates, as costs and benefits in the near future are weighted higher than those that occur further in the future when a discount rate is applied. In accordance with guidance provided by the Office of Management and Budget in Circular A-4 (“Regulatory Analysis,” 2003), the NRC presents results at both 3 percent and 7 percent discount rates (Ref. 13).

3.2 Summary of Costs and Benefits of the Regulatory Options

This section presents the costs and benefits of the proposed rule with respect to three options: (1) take no action, (2) undertake a rulemaking to revise the timely renewal provision and require FSAR updates, and (3) undertake a rulemaking to revise the timely renewal provision, require FSAR updates, and eliminate license terms for class 104a or c licensees, other than testing facilities. The NRC considered a fourth option (i.e., Option 4) that would use non-rulemaking approaches, such as the issuance of a new regulatory guide and updating NUREG-1537 (Ref. 2), to address the objectives of the rulemaking (see Section 2.4). Option 4 was rejected and not included in the analysis of costs and benefits because this option would not fully address any of the Commission’s directions and the NRC staff’s objectives for the rulemaking. Where possible, the NRC monetizes the impacts of the regulatory options. Those impacts that cannot be monetized are instead described, to the extent possible, quantitatively or qualitatively. This section presents a summary of the total costs and benefits associated with each option. Sections 3.3 and 3.4 describe the costs and benefits of the proposed requirements in greater detail. Note that all costs and benefits presented in this analysis are rounded to two significant figures. The NRC used Monte Carlo simulation methods to account for uncertainty in the

estimated costs and benefits of the proposed rule. See Section 3.6 for a detailed discussion of the uncertainty analysis. Refer to Appendix B for a more detailed presentation of the cost data.

Option 1: Take No Action [Not Selected]

Under Option 1 (not selected), the NRC assumes that the rule would not be implemented; however, existing programs and regulatory efforts would still be in effect. There would be no incremental costs or benefits associated with this option over the 20-year analysis period, as shown in Exhibit 3-4.

Exhibit 3-4. Summary of Incremental Costs and Benefits for Option 1: No Action Baseline [Not Selected]

Incremental Costs	Incremental Benefits
NPUFs: $0 using a 3% discount rate $0 using a 7% discount rate	None.
NRC: $0 using a 3% discount rate $0 using a 7% discount rate	None.

Option 2: Undertake Rulemaking to Require Final Safety Analysis Report Updates and Revise the Timely Renewal Provision [Not Selected]

Under Option 2 (not selected), the NRC assumes that the current license renewal process would remain in place. In addition, the NRC would require submittal of FSAR updates every five years. This additional requirement would impose incremental costs (implementation and operational) to both NPUFs and NRC equal to the costs incurred under the proposed rule (Option 3) without any of the monetized cost savings (benefits).[3] Exhibit 3-5 displays the monetary costs and benefits of Option 2. Note that Total Costs (column B) in Exhibit 3-5 are equal to the Total Costs (column C) of the proposed rule (Option 3) in Exhibit 3-6. The total costs of Option 2 are estimated at $2.8 million (assuming 7 percent discounting) and $3.4 million (assuming 3 percent discounting) over the 20-year analysis period.

[3] While the requirement of licensees to keep FSARs up to date may result in a gain in efficiency during the license renewal process, estimating these efficiencies would be speculative and therefore the NRC does not attempt to quantify or monetize these increases.

Exhibit 3-5. Summary of Total Costs and Benefits for Option 2 [Not Selected] (2016$)

Year		Total Benefits	Total Costs	Net Benefits
		A	B	C = A – B
1	2019	$0	$870,000	($870,000)
2	2020	$0	$380,000	($380,000)
3	2021	$0	$340,000	($340,000)
4	2022	$0	$110,000	($110,000)
5	2023	$0	$0	$0
6	2024	$0	$0	$0
7	2025	$0	$380,000	($380,000)
8	2026	$0	$340,000	($340,000)
9	2027	$0	$110,000	($110,000)
10	2028	$0	$0	$0
11	2029	$0	$0	$0
12	2030	$0	$380,000	($380,000)
13	2031	$0	$340,000	($340,000)
14	2032	$0	$110,000	($110,000)
15	2033	$0	$0	$0
16	2034	$0	$0	$0
17	2035	$0	$380,000	($380,000)
18	2036	$0	$340,000	($340,000)
19	2037	$0	$110,000	($110,000)
20	2038	$0	$0	$0
Undiscounted 20-year total		$0	$4,200,000	($4,200,000)
20-year total with 3% discounting		$0	$3,400,000	($3,400,000)
20-year total with 7% discounting		$0	$2,800,000	($2,800,000)
20-year undiscounted average		$0	$210,000	($210,000)
Annualized with 3% discounting*		$0	$230,000	($230,000)
Annualized with 7% discounting*		$0	$260,000	($260,000)

*The following formula was used to calculate discounted annualized costs and benefits (where r is the discount rate and n is the number of years [20]): $Annualized\ Cost = Present\ Value\ Cost \cdot \frac{r \cdot (1+r)^n}{(1+r)^n - 1}$.

Note that the annualized cost estimates at 3 percent and 7 percent are higher than the undiscounted yearly average cost estimate because the annualized cost formula described above accounts for both the number of periods (20 years) and the discount rate, which together in this formula serve as a growth rate.
Totals may not add due to rounding.

Option 3: Undertake Rulemaking to Require Final Safety Analysis Report Updates, Revise the Timely Renewal Provision, and Eliminate License Terms for Class 104a or c Licensees, Other than Testing Facilities [Selected – Proposed Rule]

Under Option 3 (the proposed rule), the NRC would undertake the proposed rulemaking to alter the existing license renewal process in favor of non-expiring licenses for qualifying facilities. The NRC estimates the costs and benefits of Option 3 relative to a no action baseline (i.e., Option 1). Option 3 would result in incremental costs of $2.8 million (using a 7 percent discount

rate) or $3.4 million (using a 3 percent discount rate) over the 20-year analysis period. Exhibit 3-6 presents the breakdown of total costs.

Exhibit 3-6. Summary of Total Costs for Option 3 [Selected – Proposed Rule] (2016$)

Year		NPUF Cost	NRC Cost	Total Costs
		A	B	C = A + B
1	2019	$140,000	$720,000	$870,000
2	2020	$180,000	$200,000	$380,000
3	2021	$160,000	$180,000	$340,000
4	2022	$53,000	$61,000	$110,000
5	2023	$0	$0	$0
6	2024	$0	$0	$0
7	2025	$180,000	$200,000	$380,000
8	2026	$160,000	$180,000	$340,000
9	2027	$53,000	$61,000	$110,000
10	2028	$0	$0	$0
11	2029	$0	$0	$0
12	2030	$180,000	$200,000	$380,000
13	2031	$160,000	$180,000	$340,000
14	2032	$53,000	$61,000	$110,000
15	2033	$0	$0	$0
16	2034	$0	$0	$0
17	2035	$180,000	$200,000	$380,000
18	2036	$160,000	$180,000	$340,000
19	2037	$53,000	$61,000	$110,000
20	2038	$0	$0	$0
Undiscounted 20-year total		$1,700,000	$2,500,000	$4,200,000
20-year total with 3% discounting		$1,300,000	$2,100,000	$3,400,000
20-year total with 7% discounting		$1,000,000	$1,700,000	$2,800,000
20-year undiscounted average		$85,000	$130,000	$210,000
Annualized with 3% discounting*		$90,000	$140,000	$230,000
Annualized with 7% discounting*		$98,000	$170,000	$260,000

*The following formula was used to calculate discounted annualized costs and benefits (where r is the discount rate and n is the number of years [20]): $Annualized\ Cost = Present\ Value\ Cost \cdot \frac{r \cdot (1+r)^n}{(1+r)^n - 1}$.

Note that the annualized cost estimates at 3 percent and 7 percent are higher than the undiscounted yearly average cost estimate because the annualized cost formula described above accounts for both the number of periods (20 years) and the discount rate, which together in this formula serve as a growth rate.
Totals may not add due to rounding.

By implementing Option 3, a number of cost savings to both the NRC and NPUFs would be realized, as the license renewal process would be retired in favor of non-expiring licenses for qualifying facilities. The NRC estimates the benefits of Option 3 (in terms of averted costs) by estimating the cost of the current license renewal process. By moving to non-expiring licenses, Option 3 would result in incremental benefits of $8.1 million (using a 7 percent discount rate) or

$12.0 million (using a 3 percent discount rate) over the 20-year analysis period. Exhibit 3-7 presents the breakdown of total benefits.

Exhibit 3-7. Summary of Total Benefits for Option 3, the Proposed Rule (2016$)

Year		NPUF Benefits	NRC Benefits	Total Benefits
		A	B	C = A + B
1	2019	$0	$0	$0
2	2020	$0	$0	$0
3	2021	$120,000	$220,000	$340,000
4	2022	$0	$0	$0
5	2023	$0	$0	$0
6	2024	$0	$0	$0
7	2025	$0	$0	$0
8	2026	$260,000	$670,000	$930,000
9	2027	$0	$0	$0
10	2028	$1,200,000	$2,600,000	$3,700,000
11	2029	$1,200,000	$2,600,000	$3,700,000
12	2030	$150,000	$450,000	$590,000
13	2031	$920,000	$2,100,000	$3,000,000
14	2032	$250,000	$480,000	$740,000
15	2033	$250,000	$480,000	$740,000
16	2034	$150,000	$450,000	$590,000
17	2035	$250,000	$480,000	$740,000
18	2036	$250,000	$480,000	$740,000
19	2037	$250,000	$480,000	$740,000
20	2038	$250,000	$480,000	$740,000
Undiscounted 20-year total		$5,500,000	$12,000,000	$17,000,000
20-year total with 3% discounting		$3,900,000	$8,500,000	$12,000,000
20-year total with 7% discounting		$2,500,000	$5,600,000	$8,100,000
20-year undiscounted average		$270,000	$600,000	$870,000
Annualized with 3% discounting		$260,000	$570,000	$830,000
Annualized with 7% discounting		$240,000	$530,000	$770,000

*The following formula was used to calculate discounted annualized costs and benefits (where r is the discount rate and n is the number of years [20]): $Annualized\ Cost = Present\ Value\ Cost \cdot \frac{r \cdot (1+r)^n}{(1+r)^n - 1}$.
Totals may not add due to rounding.

The proposed rulemaking would ease the burden on licensees by creating non-expiring licenses which will result in considerable time and cost savings as compared to Options 1 and 2. Exhibit 3-8 summarizes the incremental costs and benefits of the proposed rule under Option 3. Option 3 would result in net benefits of $5.3 million (using a 7 percent discount rate) or $8.9 million (using a 3 percent discount rate) over the 20-year analysis period.

Exhibit 3-8. Summary of Incremental Costs and Benefits for Option 3 [Selected – Proposed Rule] (2016$)

Year		Total Benefits	Total Costs	Net Benefits
		A	B	C = A - B
1	2019	$0	$870,000	($870,000)
2	2020	$0	$380,000	($380,000)
3	2021	$340,000	$340,000	$980
4	2022	$0	$110,000	($110,000)
5	2023	$0	$0	$0
6	2024	$0	$0	$0
7	2025	$0	$380,000	($380,000)
8	2026	$930,000	$340,000	$590,000
9	2027	$0	$110,000	($110,000)
10	2028	$3,700,000	$0	$3,700,000
11	2029	$3,700,000	$0	$3,700,000
12	2030	$590,000	$380,000	$210,000
13	2031	$3,000,000	$340,000	$2,700,000
14	2032	$740,000	$110,000	$620,000
15	2033	$740,000	$0	$740,000
16	2034	$590,000	$0	$590,000
17	2035	$740,000	$380,000	$360,000
18	2036	$740,000	$340,000	$400,000
19	2037	$740,000	$110,000	$620,000
20	2038	$740,000	$0	$740,000
Undiscounted 20-year total		$17,000,000	$4,200,000	$13,000,000
20-year total with 3% discounting		$12,000,000	$3,400,000	$8,900,000
20-year total with 7% discounting		$8,100,000	$2,800,000	$5,300,000
20-year undiscounted average		$870,000	$210,000	$660,000
Annualized with 3% discounting*		$830,000	$230,000	$600,000
Annualized with 7% discounting*		$770,000	$260,000	$500,000

*The following formula was used to calculate discounted annualized costs and benefits (where r is the discount rate and n is the number of years [20]): $Annualized\ Cost = Present\ Value\ Cost \cdot \frac{r \cdot (1+r)^n}{(1+r)^n - 1}$.

Note that the annualized cost estimates at 3 percent and 7 percent are higher than the undiscounted yearly average cost estimate because the annualized cost formula described above accounts for both the number of periods (20 years) and the discount rate, which together in this formula serve as a growth rate.
Totals may not add due to rounding.

The only currently licensed testing facility, NIST, has specific requirements. The proposed rule would require that NIST continue to be subject to the license renewal process and, additionally, NIST will be tasked with submitting updated FSARs. These requirements result in the full costs of the proposed rule, without any of the averted costs (as the full NPUF license renewal application process will continue). The total 20-year undiscounted cost of the proposed rule to NIST is estimated at $77,000 with an incremental operation cost estimated at $18,000 per

FSAR update. At the time of the drafting of this report, NIST is the only NPUF which would not be eligible for a non-expiring license term.

3.3 Costs of the Proposed Rule

This section details the estimated costs and benefits (i.e., cost savings) of the proposed rule. Under the proposed rule, the following proposed change to 10 CFR part 50 would result in costs:

- Proposed 10 CFR 50.71(e) would require each NPUF licensee to submit an updated FSAR to the NRC every five years.

The following proposed rule change would result in cost savings (see Section 3.4 for detailed discussion of cost savings):

- Proposed § 50.51 would eliminate fixed license terms for NPUFs licensed under § 50.21(a) or (c), other than testing facilities. This rule change would result in cost savings since the affected NPUFs would no longer be required to go through the license renewal application process.

In addition, the proposed rule also would include the following proposed changes, which are not analyzed in this regulatory analysis:

- Proposed changes in 10 CFR 2.109 would require certain NPUF licensees to file an application for license renewal at least two years (rather than the current 30 days) before the expiration of the existing license. This proposed rule provision would not impose any incremental costs on the NPUFs that would continue to be subject to license renewal, as this activity occurs in the baseline, albeit at a different time (30 days before expiration of the existing license). In addition, the NRC expects this proposed rule change to provide cost savings due to efficiency gains during the license renewal process. While this proposed requirement would result in gains in efficiency during the license renewal process, estimating these efficiencies would be speculative and, therefore, the NRC did not attempt to quantify or monetize these increases.

- Proposed changes in § 50.2 would define an NPUF as a non-power reactor, testing facility, or other production or utilization facility, licensed under § 50.21(a), 50.21(c), or 50.22, other than a power reactor. This provision is an administrative change to ensure that all variations of NPUFs would be covered under the proposed rulemaking.

- Proposed changes in § 50.33(f)(2) would eliminate the requirement that NPUF applicants need to submit financial information in their license renewal applications that is equivalent to financial information included at the time of initial licensing. While this proposed requirement would result in cost savings during the license renewal process, estimating these cost savings would be speculative and, therefore, the NRC did not attempt to quantify or monetize these increases.

- Proposed changes in § 50.34 would establish an accident dose criterion for NPUFs. Existing licensees would not need to change any existing practices. Therefore, this proposed provision would not impose incremental costs on licensees.

- Proposed changes in § 50.59(b) would extend the applicability of § 50.59 to NPUFs that have permanently ceased operations and returned fuel to the DOE. For the purposes of this analysis, the NRC does not anticipate existing NPUF licensees to permanently cease operations and return fuel to the DOE during the 20-year period of analysis. Therefore, this administrative change would not result in any costs savings during the 20-year period of analysis.

- Proposed changes in § 50.82 would make conforming changes to existing requirements to align terminology and existing requirements to the terminology and non-expiring license terms in the proposed rule. These administrative changes would not result in incremental costs.

- Proposed § 50.135 would define a license renewal process specific to NPUFs with licenses issued under § 50.22 and testing facilities licensed under § 50.21(c), consolidating existing requirements for current and future licensees in one section. The proposed rule would not change the license renewal process from current requirements. Therefore, the analysis does not include incremental costs for these requirements.

- Proposed changes in 10 CFR 51.45 would cite a new § 51.56 in the list of sections that would require each applicant or petitioner to submit an environmental report. This would be an administrative change that would not impose incremental costs on licensees or the NRC.

- Proposed § 51.56 would clarify the existing requirements for each applicant for an NPUF license or license renewal to submit an environmental report. The NRC currently requires licensees to submit equivalent environmental information in the baseline. This section would establish the regulatory framework, which currently does not exist. Therefore, the proposed provision would not result in any incremental costs.

3.3.1. Affected Entity Implementation

The proposed rule would impose implementation costs on 31 NPUFs. These incremental implementation costs include: reviewing the finalized rule, reviewing the NRC-issued guidance documents, reviewing and updating facility procedures, and allowing the facility's safety review board to review the rule and guidance. One-time NPUF implementation costs are assumed to accrue in 2019 (the expected effective date of the rule).

Exhibit 3-9 presents a breakdown of the NPUF implementation costs by the varying categories of NPUFs (Low, Medium, and High). These costs include: reviewing the finalized rule, reviewing NRC-issued guidance documents, reviewing and updating procedures, and the providing review by the safety review board. The NRC estimates the implementation costs to range from $4,300 for each NPUF in the Low category to $4,900 for each NPUF in the High category.

Exhibit 3-10 details the NPUF's implementation costs, which amount to total costs per category of $22,000 for the Low category, $48,000 for the Medium category, and $73,000 for the High category NPUFs. These per-category costs amount to a total one-time NPUF implementation cost of $140,000 over the 20-year analysis period.

Exhibit 3-9. Breakdown of Affected Entity Implementation Costs per NPUF (2016$)

One-time NPUF Implementation Costs	Low	Medium	High
Reviewing Finalized Rule	$1,000	$1,000	$1,100
Reviewing NRC-Issued Guidance Documents	$1,000	$1,000	$1,100
Reviewing and Updating Procedures	$1,600	$1,600	$2,000
Safety Review Board	$700	$700	$700
Total One-time NPUF Implementation Costs	**$4,300**	**$4,300**	**$4,900**

NOTE: Totals may not add due to rounding.
Totals represent per-NPUF costs.

Exhibit 3-10. Total Present Value Affected Entity Implementation Costs (2016$)

		Low	Medium	High
One-time NPUF Implementation Costs	**A**	$4,300	$4,300	$4,900
Number of NPUFs	**B**	5	11	15
Cost per Category	**C = A x B**	$22,000	$48,000	$73,000
Total Present Value Implementation Cost	**D = ∑ (C)**	**$140,000**		

NOTE: The Cost per Category is equal to the One-time NPUF Implementation Costs multiplied by the Number of NPUFs per category (see Exhibit 3-1). The Present Value Total Implementation Cost is equal to the summation of the Cost per Category. Because all of the implementation costs are assumed to incur during the first year of the rule, discounting at 3 and 7 percent results in the same present value.
Totals may not add due to rounding.

3.3.2. Affected Entity Operation

The proposed rule would impose operational costs on the 31 NPUFs. These incremental operational costs include routine and recurring activities under the proposed rule, such as preparing and submitting an updated FSAR, preparing for and participating in review-related inspection activities, and participating in a lengthened inspection exit meeting. Inspection-related activities resulting from the proposed rule would *not* require new inspections. Instead, any inspection-related activities are add-on activities to inspections happening in the baseline (e.g., the routine inspection program for NPUFs).

Recurring operation costs are assumed to begin in 2020 (one year after the effective date of the rule) for Group 1, 2021 for Group 2, and 2022 for Group 3 (see Exhibit 3-2 for NPUF groupings), based on an NRC-determined phase-in of FSAR submittals. These operational costs are assumed to occur every five years, aligning with the required FSAR updates for each group.

Exhibit 3-11 presents the breakdown of the NPUF operational costs by category. These costs include: preparing the updated FSAR, preparing for the review-related inspection, participating in review-related inspection activities, and participating in a lengthened exit meeting. The NRC estimates the operational cost to be $5,400 per Low category, $8,300 per Medium category, and $18,000 per High category NPUF per FSAR update.

Exhibit 3-11. Breakdown of Affected Entity Operational Costs (2016$)

NPUF Operational Costs	Low	Medium	High
Preparing Updated FSAR	$5,000	$7,500	$17,000
Preparing for Review-Related Inspection	$260	$590	$1,200
Participating in Review-Related Inspection	$130	$130	$250
Participating in Exit Meeting*	$0	$0	$0
Total NPUF Operational Cost per FSAR Update	**$5,400**	**$8,300**	**$18,000**

* Value represents the average from the uncertainty analysis. See Section 3.6 and Appendix B for more information.
NOTE: Totals may not add due to rounding.
Total Costs are per NPUF per FSAR update.

Exhibit 3-12 presents the total NPUF operational costs. Over the course of the 20-year analysis period, there will be four FSAR updates (one every five years). Therefore, the Undiscounted Total Operating Cost (row D) is equal to the Cost per FSAR Update (row C) multiplied by four (for four updates in 20 years). These costs per category amount to a total NPUF operation cost of $1.6 million undiscounted ($900,000 using a 7 percent discount rate and $1,200,000 using a 3 percent discount rate) over the 20-year analysis period.

Exhibit 3-12. Total Present Value Affected Entity Operational Costs (2016$)

		Low	Medium	High
NPUF Operational Cost per FSAR Update	**A**	$5,400	$8,300	$18,000
Number of Licensees	**B**	5	11	15
Operational Cost per Category per FSAR Update	**C = A x B**	$27,000	$91,000	$270,000
Undiscounted Total Present Value Operational Cost	**D = ∑ (C) x 4**	$1,600,000		
Total Present Value NPUF Operational Cost at 3% discounting		$1,200,000		
Total Present Value NPUF Operational Cost at 7% discounting		$900,000		

NOTE: The Operation Cost per Category per FSAR Update (C) is equal to the NPUF Operation Cost per FSAR update (A) multiplied by the number of NPUFs per category (B, see Exhibit 3-1). The Undiscounted Total NPUF Operating Cost (D) is equal to the Operation Cost per Category per FSAR Update (C) multiplied by four (the number of FSAR updates required per NPUF over the 20 year time period of the analysis).
Totals may not add due to rounding.

3.3.3. NRC Implementation

The proposed rule also would impose implementation costs on the NRC. These incremental implementation costs include procedural and administrative activities such as finalizing the rulemaking, developing guidance on the revised license renewal process, issuing orders to remove license terms and trigger FSAR update submittals, training NRC staff, and updating the project manager (PM) qualification program. These one-time costs are assumed to be incurred in 2019.

Exhibit 3-13 presents the NRC's total implementation costs which amount to a one-time cost of $720,000 over the 20-year analysis period. The NRC's implementation costs are not reliant on the number or category of the licensees.

Exhibit 3-13. Breakdown of NRC Implementation Costs (2016$)

NRC One-time Licensee Implementation Costs	Low	Medium	High
Finalizing Rulemaking		$680,000	
Developing Guidance on Revised License Renewal Process		$19,000	
Issue Orders to Remove License Terms		$10,000	
Training NRC Staff		$15,000	
Updating Project Manager Qualification Program		$1,600	
Total Present Value NRC Implementation Cost		**$720,000**	

NOTE: Totals may not add due to rounding.

3.3.4. NRC Operation

The proposed rule also would impose operational costs on the NRC. These incremental operational costs include the recurring activities under the proposed rule such as the review of the updated FSARs, and the preparation and completion of review-related inspection activities. Recurring operation costs are assumed to begin in 2020 (one year after the effective date of the rule) for Group 1, 2021 for Group 2, and 2022 for Group 3.

Exhibit 3-14 details the NRC's operational costs, which amount to $7,800 per Low category licensee, $13,000 per Medium category licensee, and $18,000 per High category licensee. These values amount to the cost of reviewing one round of FSAR updates.

Exhibit 3-15 presents the total NRC operational costs over the analysis period. Over the course of the 20-year analysis period, there will be four updates (one every five years) and, consequently, four reviews. Therefore, these per-category costs amount to total NPUF operational costs of $1.8 million undiscounted ($1,000,000 using a 7 percent discount rate and $1,400,000 using a 3 percent discount rate) over the 20-year analysis period.

Exhibit 3-14. Breakdown of NRC Operational Costs (2016$)

NRC Operational Costs	Low	Medium	High
Reviewing Updated FSAR	$7,800	$10,000	$13,000
Preparing for Review-Related Inspection Activities	$0	$780	$1,600
Completing Review-Related Inspection	$0	$780	$1,600
Closing Review-Related Inspection Activities	$0	$780	$1,600
Total NRC Operational Cost per FSAR Update	**$7,800**	**$13,000**	**$18,000**

NOTE: Totals may not add due to rounding.
Total NRC operation costs are costs per FSAR Update per NPUF.

Exhibit 3-15. Present Value of NRC Operational Costs (2016$)

		Low	Medium	High
NRC Operational Costs per FSAR Update	**A**	$7,800	$13,000	$18,000
Number of Licensees	**B**	5	11	15
Operational Costs per Category per FSAR Update	**C = A x B**	$39,000	$140,000	$260,000
Undiscounted Total Present Value Operational Cost	**D = ∑ (C) x 4**	$1,800,000		
Total Present Value NRC Operational Cost at 3% discounting		$1,400,000		
Total Present Value NRC Operational Cost at 7% discounting		$1,000,000		

NOTE: The NRC Operation Cost per Category per FSAR Update (C) is equal to the NRC Operation Cost per FSAR update (A) multiplied by the number of NPUFs per category (B, see Exhibit 3-1). The Undiscounted Total NRC Operating Cost (D) is equal to the Operation Cost per Category per FSAR Update (C) multiplied by four (the number of FSAR updates required per NPUF over the 20 year time period of the analysis.
Totals may not add due to rounding.

3.4 Benefits of the Proposed Rule

Relative to the no action baseline, the incremental benefits from the options under consideration are as follows:

- Option 1 (not selected): No action alternative. This option would not result in any incremental benefits.

- Option 2 (not selected): Undertake rulemaking to require FSAR updates and revise the timely renewal provision. This option would result in improvements in the following attributes: Public Health and Safety (Accident), Occupational Health (Accident), Offsite Property, Onsite Property, Environmental Considerations, and Regulatory Efficiency.

- Option 3 (the proposed rule): Undertake rulemaking to require FSAR updates, revise the timely renewal provision, and eliminate license terms for Class 104a or c licensees, other than testing facilities (among other changes described in Section 3.3). This option, which is the proposed option, would result in operation cost savings, improvements to Public Health and Safety, as well as substantial improvements associated with Regulatory Efficiency (as discussed below).

3.4.1 Benefits Associated with Affected Entities and NRC Operation

This section details the estimated benefits (i.e., cost savings) of the proposed rule for both affected entities and the NRC. The monetized benefits of the proposed rule are averted operational costs. The averted operational costs for NPUFs are presented in Exhibit 3-16. These averted costs stem from the savings in time and money created by discontinuing the existing license renewal process for qualifying NPUFs (i.e., currently operating research reactors). The NPUF averted operational cost represents the cost savings per NPUF by switching to non-expiring licenses. The total averaged cost per category is determined by multiplying the averted costs by the number of licensees (row B). Note that the number of licensees differs from Exhibit 3-1 as NIST, Aerotest, and General Electric (GE) are assumed to not have averted costs. These licensees either continue to go through the existing license renewal process (NIST) or have their renewals under the existing process due outside of the time horizon of this analysis. Under this analysis, these licensees (GE and Aerotest), therefore, do not realize any cost savings as a result of the proposed rule. If the analysis time period were

extended, GE and Aerotest would realize cost savings from the proposed rule similar to the savings realized by other licensees.

The NRC conservatively estimates that the proposed rule would result in total cost savings in the form of averted operational costs to affected entities of $5.5 million undiscounted ($2.5 million using a 7 percent discount rate and $3.9 million using a 3 percent discount rate) over the 20-year analysis period.

Exhibit 3-16. Present Value Averted Operational Costs for Affected Entities (2016$)

		Low	Medium	High
NPUF Averted Operational Cost	**A**	$120,000	$150,000	$250,000
Number of Licensees	**B**	5	9	14
Averted Operational Cost per Category	**C = A x B**	$580,000	$1,300,000	$3,600,000
Undiscounted Total Present Value Averted Operational Cost	**D = ∑ (C)**	$5,500,000		
Total Present Value NPUF Averted Operational Cost at 3% discounting		$3,900,000		
Total Present Value NPUF Averted Operational Cost at 7% discounting		$2,500,000		

NOTE: The number of licensees differs from Exhibit 3-1 as NIST, Aerotest, and GE are assumed to not realize any averted costs.
Totals may not add due to rounding.

The averted operational costs realized by the NRC are presented in Exhibit 3-17. These averted operational costs stem from the savings in time and resources from the review of submitted NPUF license renewal applications that would no longer be required under non-expiring license terms.

The NRC's averted operational cost represents the cost savings per NPUF by switching to non-expiring licenses. The total averaged cost per category is determined by multiplying the averted costs by the number of licensees (row B). Note that the number of licensees differs from Exhibit 3-1 as discussed above.

The NRC conservatively estimates that the proposed rule would result in total averted costs to the agency of $12 million undiscounted ($5.6 million using a 7 percent discount rate and $8.5 million using a 3 percent discount rate) over the 20-year analysis period.

Exhibit 3-17. Present Value Averted Operational Costs for NRC (2016$)

		Low	Medium	High
NRC Averted Operational Costs	**A**	$220,000	$450,000	$480,000
Number of Licensees	**B**	5	9	14
Averted Operational Costs per Category	**C = A x B**	$1,100,000	$4,000,000	$6,800,000
Undiscounted Total Present Value Averted Operational Cost	**D = ∑ (C)**	$12,000,000		
Total Present Value NRC Averted Operational Cost at 3% discounting		$8,500,000		
Total Present Value NRC Averted Operational Cost at 7% discounting		$5,600,000		

NOTE: The number of licensees differs from Exhibit 3-1 as NIST, Aerotest, and GE are assumed to not have averted costs.
Totals may not add due to rounding.

It is important to note that these averted costs represent conservative estimates for the total benefits of the proposed rule. The NRC relied on input from licensees to estimate the averted costs. This input varied widely. As a conservatism, the NRC used the lowest LOE estimates provided by the licensees. Therefore, the resulting cost savings values are likely underestimated. Because the proposed rule already results in a net benefit (cost savings), the potential underestimation of averted costs does not affect the cost-beneficial nature of the proposed rule. The potential underestimation of averted costs only means that implementation of the proposed rule could result in higher savings to both licensees and the NRC than are presented in this analysis.

3.4.2 Benefits Associated with Public Health (Accident), Occupational Health (Accident), Offsite Property, Onsite Property, and Environmental Considerations

Because NPUFs operate at a low power level and are recognized as having no major impact on the environment or public health and safety, both the safety risks, public health, occupational health, and environmental benefits associated with the rule are very small.

Under Option 3 (the proposed rule), to qualify for non-expiring license terms, all eligible NPUF licensees would be required to undergo license renewal per NUREG-1537 to ensure that each facility's licensing basis has been adequately re-constituted.[4] The re-constitution of the licensing basis would ensure that all site issues, technical specifications, and FSAR chapters are correct, up-to-date, and consistent with the guidance in NUREG-1537. Because all design and safety feature information must be current and must pass regulatory standards, a reconstituted licensing basis would provide reasonable assurance that licensees operate their facilities safely and consequently that public health and safety are protected.

This proposed rule would add new requirements such as periodic FSAR updates, which would help ensure that a licensee does not lose its reconstituted licensing basis over time. Specifically, because the rule would require that updates to the FSAR occur at much shorter intervals, the NRC and licensees would benefit from greater knowledge management and

[4] By the time the rule would be effective, the NRC will have reconstituted the licensing bases for all but four NPUFs. These four NPUFs would be subject to license renewal prior to being granted a non-expiring license.

information transfer. Moreover, the FSAR updates would allow NRC PMs to monitor and address facility changes or issues far sooner than the current license renewal process allows. This enhanced oversight would provide a safety benefit, because the NRC would be able to more efficiently and effectively identify and address safety concerns.

3.4.3 Benefits Associated with Regulatory Efficiency

Under Option 3 (the proposed rule), the NRC anticipates that the license renewal streamlining requirements would result in benefits to regulatory efficiency. By consolidating existing regulation language regarding the license renewal process, and by revising the timely renewal provision for class 103 licensees and testing facilities, the NRC anticipates a more efficient license renewal process.

The benefit associated with regulatory efficiency for this rulemaking stems from the clarity and consolidation of the regulatory requirements related to license renewal for class 103 licensees and testing facilities in proposed 10 CFR 50.135. Currently, NPUF license renewal requirements are not clearly delineated in title 10 of the CFR. This lack of a regulatory framework causes confusion and difficulty for licensees trying to navigate the license renewal process. By clearly defining the license renewal processes for these facilities, the NRC anticipates a reduction in burden and an increase in regulatory efficiency.

3.5 Disaggregation

The proposed rule (Option 3) imposes additional costs on regulated entities by requiring each NPUF licensee to submit an updated FSAR to the NRC every five years. The one provision of the proposed rule that would impose additional costs on licensees is disaggregated as Option 2 (not selected). Section 3.3 and Appendix B present the disaggregated costs of Option 2 (i.e., costs associated with submitting an updated FSAR) and demonstrate their impact on licensees. The NRC has determined that this provision is necessary to meet the rulemaking objective to streamline the license renewal process while achieving the same reasonable assurance to protect public health and safety and the environment and ensure common defense and security.

3.6 Uncertainty Analysis

To determine the robustness of the costs and net benefits of the proposed rule, the NRC examined how NPUF and the NRC costs change due to uncertainties associated with the NRC's analytical assumptions and input data. As mentioned in Section 3.1, the NRC used Monte Carlo simulation to examine the impact of uncertainty on the estimated net benefits of the proposed rule. These Monte Carlo simulations were performed using the @Risk software package by Palisade Corporation.[5]

Monte Carlo simulations involve introducing uncertainty into the analysis by replacing the point estimates of the variables used to estimate costs and benefits with probability distributions. By defining input variables as probability distributions as opposed to point estimates, the effect of uncertainty on the results of the analysis (i.e., the net benefits) can be effectively modeled.

The Monte Carlo simulations were performed by repeatedly running the analysis, up to 5,000 times. For each iteration of the analysis, a value was chosen randomly from the probability

[5] Information about this software is available online at www.palisade.com.

distributions that define the input variables. The value of the output variable (the net benefits) was recorded for each iteration, and all of the resulting values for the output variable were used to define a distribution for the results.

3.6.1. Uncertainty Model Inputs

In this analysis, the NRC assigned probability distributions to the LOEs, workload percentages, and existing NRC costs to account for uncertainty, and the NRC assigned probability distributions to these inputs for Low, Medium, and High category facilities. The LOEs for both the NPUFs and the NRC for the current license renewal process and the proposed rule are uncertain and, therefore, the NRC assigned distributions to these variables. The NRC also assigned probability distributions to the workload percentages, or the amount of work performed by each labor category. Finally, the NRC relied upon NRC timekeeping data and NRC contractor cost data to develop estimates for the cost of the existing license renewal process to the NRC. The NRC assigned probability distributions informed by these data to the NRC costs.

The probability distributions chosen to represent the different variables in the analysis were bounded by the range of LOE and labor category workloads provided by licensee input and the NRC staff's professional judgment. These distributions have mean values equal to the average LOE or workload per NPUF category (Low, Medium, and High). These mean values appear in the Exhibits in Section 3.2, Section 3.3, and Appendix B.

When defining the probability distributions for use in the Monte Carlo simulation, other summary statistics besides the mean value were needed to characterize the distributions. These other summary statistics include the standard deviation of a distribution with a normal shape, or the minimum and maximum of a triangular distribution. For the LOE distributions, the NRC used input from licensees to set the minimum and maximum values of the triangular distributions. For the workloads by labor category, the NRC used a standard deviation of 10 percent of the mean, which allows the distribution to range by 10 percent of the mean value above and below the mean.

In particular cases, such as for process steps involving review-related inspection activities, the NRC used a discrete distribution. This type of distribution was used when the desired range of the LOE had a high probability of zero and the remaining probability distributed in a range above zero. For example, the NRC used a discrete distribution to model the potential LOE for revising an NPUF license renewal application. The NRC assumes that, for 50 percent of licensees, no revisions are necessary, and, therefore, the LOE would be equal to zero. For the other licensees that would be revising license renewal applications, the NRC estimates that the LOE may be as high as 2,000 hours.

As an example of the variables and distributions used in the Monte Carlo simulations, Exhibit 3-18 displays the inputs for the analysis runs for Medium category facilities (see Exhibit 3-1). The NRC constructed these distributions differently for Low, Medium, and High category facilities. Appendix B contains a more complete list of the variables included in the uncertainty analysis.

Exhibit 3-18. Example Variables and Distributions Used in the Monte Carlo Analysis (Medium Category)

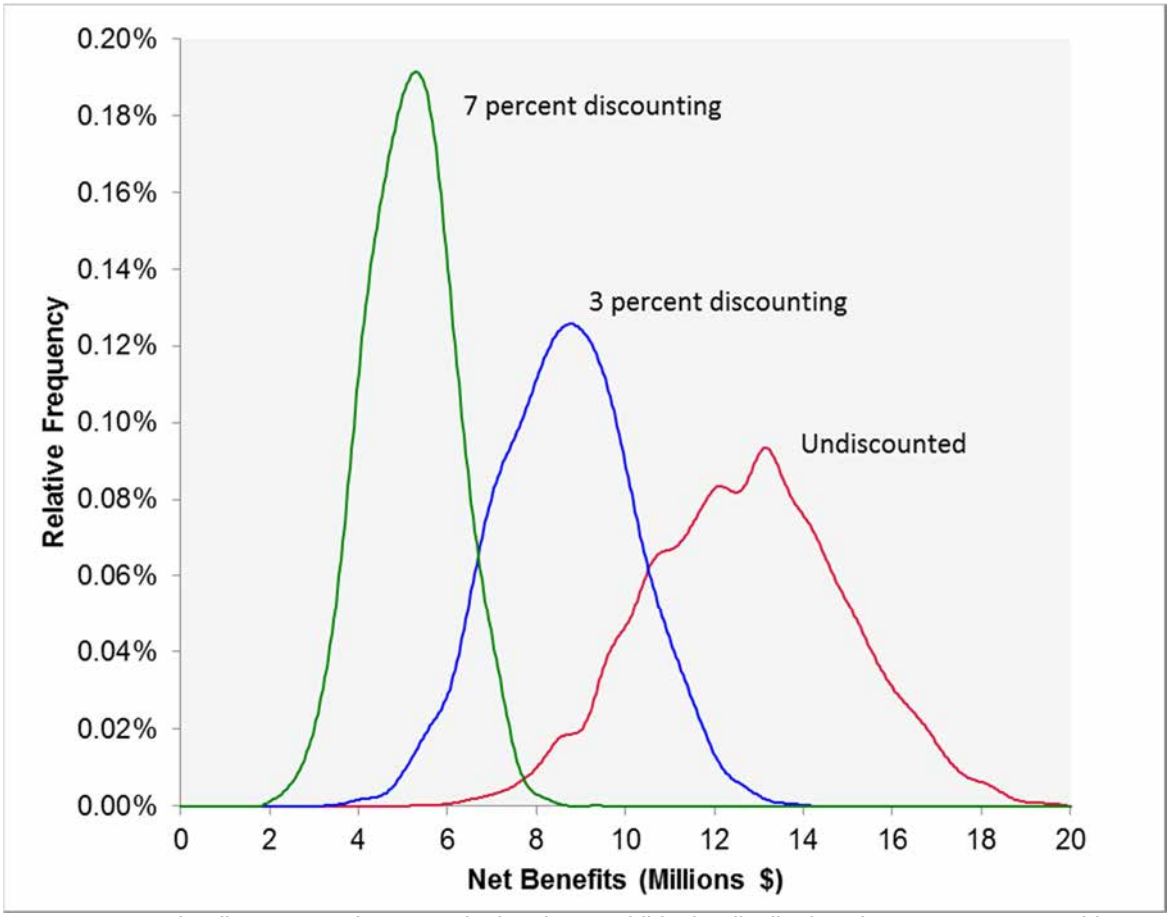
Variable	Description	Distribution	Mean	Standard Deviation	Minimum	Maximum
Responding to RAI Set # 1	NPUF Pre Rule LOE*	Triangular	125 hours		50 hours	200 hours
Preparing Updated FSAR	NPUF Post Rule LOE	Triangular	127.5 hours		110 hours	145 hours
Preparing Updated FSAR	NPUF Post Rule Graduate Student Workload	Triangular	60%	10%		
Revising License Renewal Application	NPUF Pre Rule LOE	Discrete	1000 hours	50%, 0 hours 10%, 1000 hours 10%, 1250 hours 10%, 1500 hours 10%, 1750 hours 10%, 2000 hours		
Training NRC Staff	NRC Post Rule LOE	Triangular	116 hours	10%		

*Costs described as "Pre Rule LOE" are costs assumed not to be incurred by licensees after the effective date of the rule (i.e., averted costs or cost savings).

3.6.2. Uncertainty Model Results

Exhibit 3-19 presents a summary of the distribution of the undiscounted net benefits (red), and the results discounted at 3 (blue) and 7 percent (green). The exhibits below present the results and include all categories of facilities (Low, Medium, and High). As can be seen below, regardless of discount rate, the proposed rule has a positive net benefit (100 percent of the distributions are above zero).

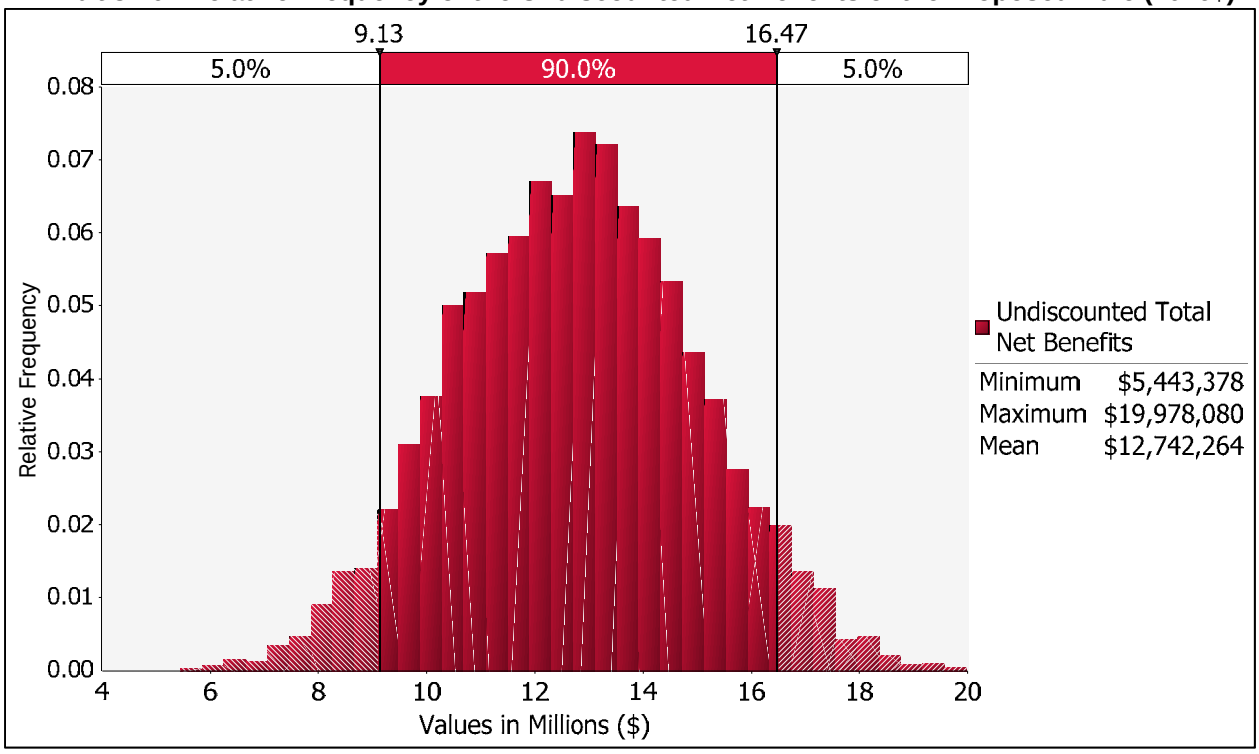
Exhibit 3-19. Relative Frequency of the Net Benefits of the Proposed Rule (2016$)



NOTE: As the discount rate increases in the above exhibit, the distributions become narrower. This narrowing is a result of the decreasing range of present value net benefits as discount rates increase. Larger discount rates result in smaller costs and benefit values in later years in the analysis period, resulting in a smaller range and a narrower distribution.

Exhibit 3-20 displays the results of the uncertainty analysis for the net benefits (benefits minus costs) of the proposed rule. By allowing uncertain assumptions and inputs to range across a distribution the results are no longer static and instead spread across a range with varying degrees of certainty. In this particular simulation, the analysis indicates that 90 percent of the times the model was run (out of 5,000 times) the proposed rule resulted in a benefit of $9.1 million to $16 million. In some iterations, the model did result in a net benefit as low as $5.4 million and as high as $20 million, with an average of $13 million.

Exhibit 3-20. Relative Frequency of the Undiscounted Net Benefits of the Proposed Rule (2016$)



Similarly, the net benefits with 7 and 3 percent discounting can be seen in Exhibit 3-21 and Exhibit 3-22. When using 7 percent discounting, 90 percent of the times the model was run the proposed rule resulted in a benefit of $3.5 million to $6.9 million. In some iterations the model did result in a net benefit as low as $1.8 million and as high as $8.5 million, with an average of $5.2 million.

When using 3 percent discounting, 90 percent of the times the model was run, the proposed rule resulted in a benefit of $6.1 million to $11 million. In some iterations, the model did result in a net benefit as low as $3.5 million and as high as $14 million, with an average of $8.7 million.

Exhibit 3-21. Relative Frequency of the Net Benefits of the Proposed Rule at 7 Percent Discounting (2016$)

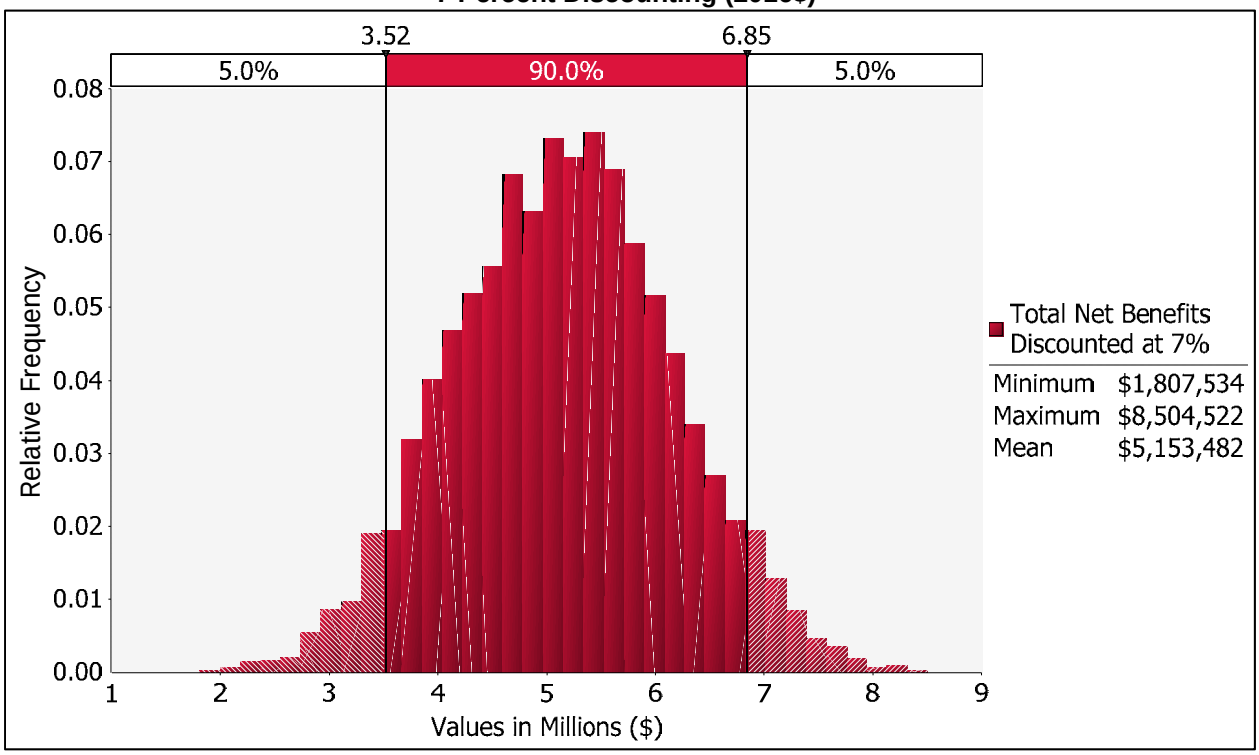
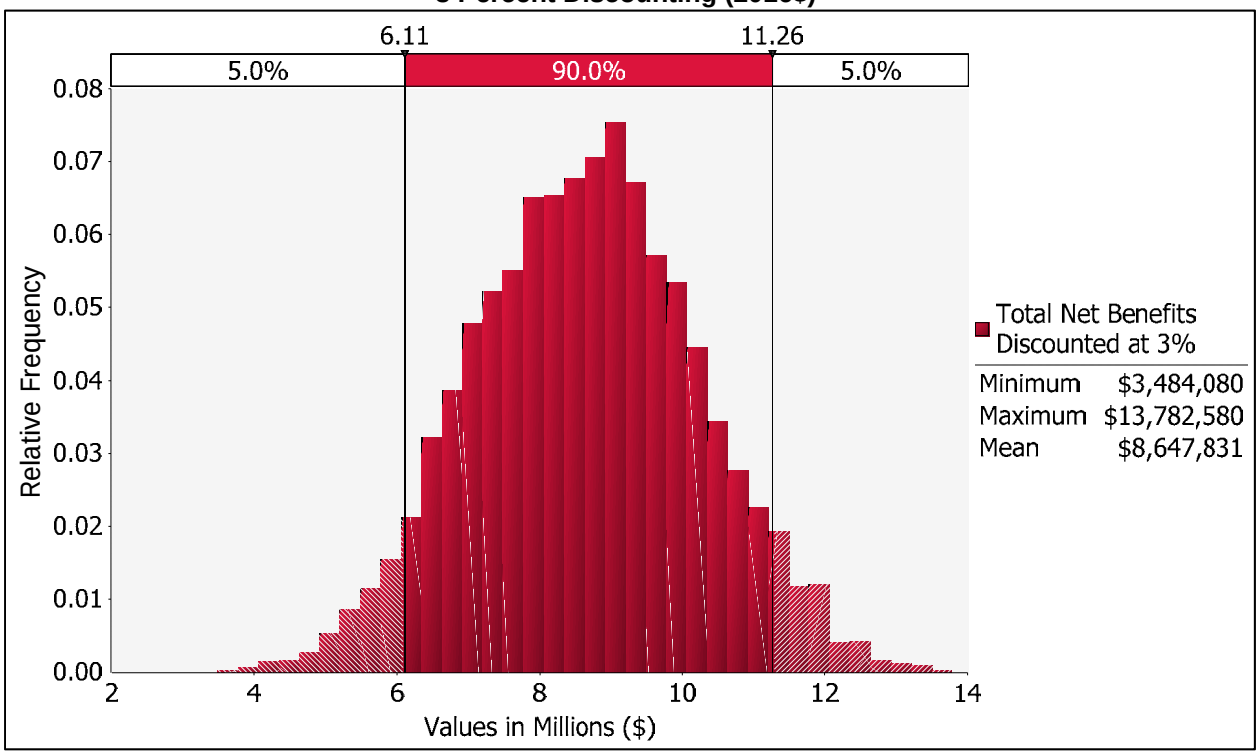


Exhibit 3-22. Relative Frequency of the Net Benefits of the Proposed Rule at 3 Percent Discounting (2016$)



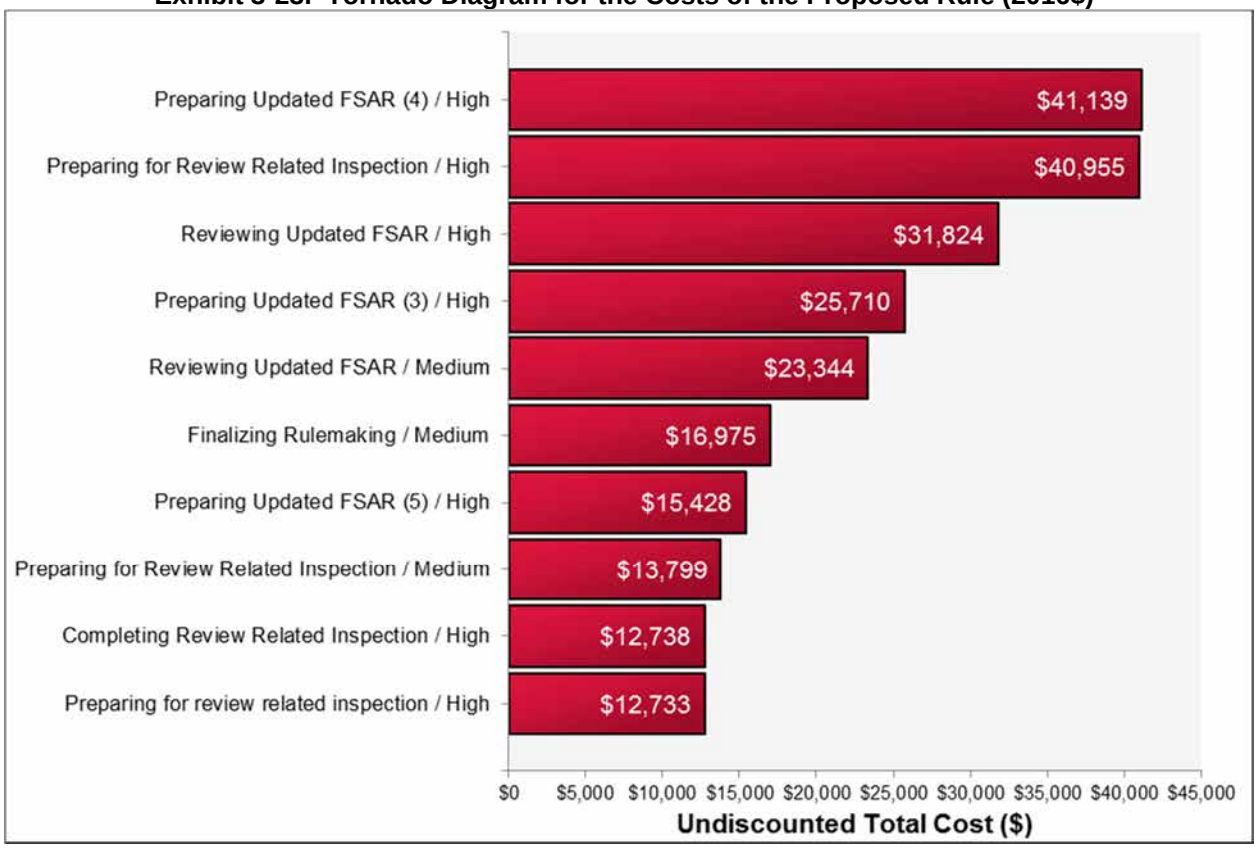
Examining the range of the resulting distributions of net benefits, it is possible to more confidently discuss the potential costs and benefits of the proposed rule. As mentioned above, the exhibits display a 90 percent confidence interval, meaning that the net benefits would fall between the ranges mentioned above for 90 percent of all of the iterations run as part of the Monte Carlo simulations. In all cases, regardless of the discount rate used, the benefits of the proposed rule (in terms of averted costs) would outweigh the implementation costs of the proposed rule that would be incurred by licensees and the NRC. This result is demonstrated by the fact that the resulting distributions of net benefits, whether undiscounted or at 3 or 7 percent discount rates, are always above zero.

3.6.3. Sensitivity Analysis

In addition to estimating the probability distributions for the net benefits of the proposed rule, Monte Carlo simulation was used to conduct a sensitivity analysis to determine the variables with greatest impact on the resulting net benefits. Variables shown to have a large effect on the resulting net benefits may deserve more attention and scrutiny than variables shown to have a small or minimal effect.

To estimate the effect of each variable on the net benefits, a regression was performed with the net benefits as the dependent variable and the inputs as the independent variables. The result of this regression is called a “tornado diagram,” and it presents in vertical order the variables with the greatest influence on net benefits. The tornado diagram also displays the resulting regression coefficient for each of the input variables. Exhibit 3-23 presents a tornado diagram for the total costs of the proposed rule. Similarly, Exhibit 3-24 presents the tornado diagram for the net benefits of the proposed rule.

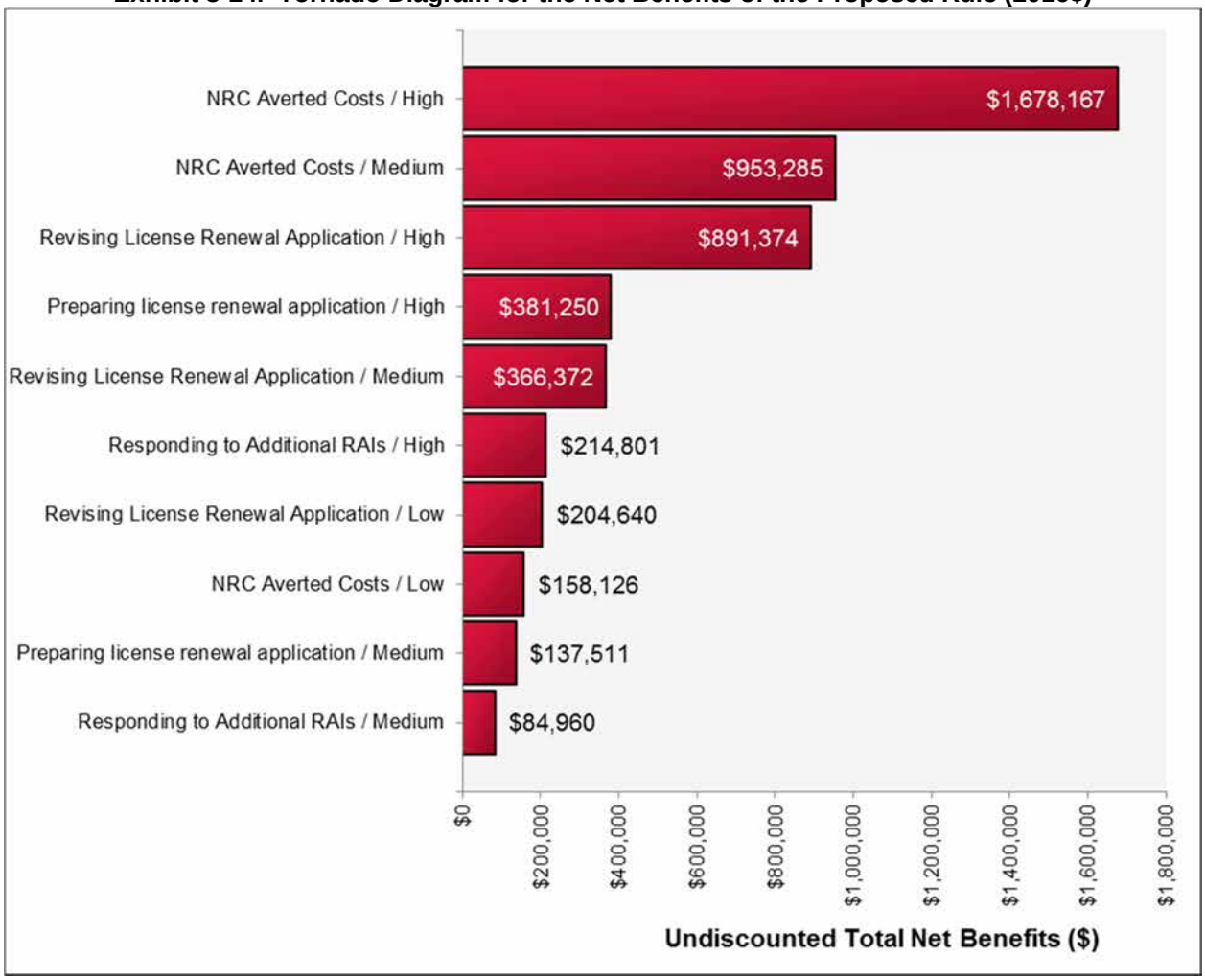
Exhibit 3-23. Tornado Diagram for the Costs of the Proposed Rule (2016$)[1]



[1] Some of the process steps, such as Preparing Updated FSARs, have multiple substeps. Exhibit B-1 and B-2 in Appendix B detail these substeps.

The Y-axis is displayed as Process Step / Category. Therefore, Row 1 shows that the largest driving cost is the cost of preparing the FSAR for the High category facilities.

Exhibit 3-24. Tornado Diagram for the Net Benefits of the Proposed Rule (2016$)



The Y-axis is displayed as Process Step / Category. Therefore, Row 1 shows that the largest net benefit is the NRC averted costs for High category facilities.

Examining the tornado diagrams provides insight into which of the current and new licensing steps have the largest impacts on the results of this analysis. From Exhibit 3-23, the parameters having the greatest influence on the total costs of the proposed rule are the costs for preparing the updated FSARs, preparing for the review related inspections, and reviewing the updated FSARs for the High category facilities. The influence of a variable on the output is not only a function of the value of the variable, but also on the spread of its distribution.

When examining Exhibit 3-24, it is important to note that the values are net benefits and, therefore, are a savings brought about by the proposed rule. The parameters having the greatest influence on the net benefits of the proposed rule are the averted costs, or savings from the proposed rule, for the NRC's review of High and Medium category facilities under the current licensing process.

4. Decision Rationale for Selection of Proposed Action

4.1 Safety Goal Evaluation

Safety goal evaluations are applicable only to regulatory initiatives considered to be generic safety enhancement backfits subject to the substantial additional protection standard at 10 CFR 50.109(a)(3). The NRC has determined that the backfit provision in § 50.109 does not apply to NPUFs (see Appendix A). Because § 50.109 does not apply to NPUFs, a safety goal evaluation is not needed.

4.2 Committee to Review Generic Requirements (CRGR)

Review by the CRGR is not needed because the proposed requirements do not qualify as backfits (see Appendix A).

References

1. U.S. Nuclear Regulatory Commission (NRC), SRM-SECY-91-061, "Separation of Non-Reactor and Non-Power Reactor Licensing Activities from Power Reactor Licensing Activities in 10 CFR Part 50," Washington, DC, April 2, 1991. (Agencywide Document Access and Management System [ADAMS] Accession No. ML010050021)

2. NRC, NUREG-1537, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors," Washington, DC, February 1996.

3. NRC, SRM-M080317B, "Staff Requirements—Briefing on the State of NRC Technical Programs," Washington, DC, April 3, 2008. (ADAMS Accession No. ML080940439)

4. NRC, SECY-08-0161, "Review of Research and Test Reactor License Renewal Applications," Washington, DC, October 24, 2008. (ADAMS Accession No. ML082550140)

5. NRC, SRM-SECY-08-0161, "Staff Requirements-SECY-08-0161-Review of Research and Test Reactor License Renewal Applications," Washington, DC, March 26, 2009. (ADAMS Accession No. ML090850159)

6. NRC, "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," SECY-09-0095, Washington, DC, June 24, 2009. (ADAMS Accession No. ML091410581)

7. NRC, SRM-M090811, "Staff Requirements Memorandum – Briefing on Research and Test Reactor (RTR) Challenges," Washington, DC, August 26, 2009. (ADAMS Accession No. ML092380046)

8. NRC, "Non-Power Reactor (NPR) License Renewal Rulemaking-Regulatory Basis Document," Washington, DC, August 27, 2012. (ADAMS Accession No. ML12240A677)

9. NRC, 79 Fed. Reg. 62329, "Definition of a Utilization Facility," Washington, DC, October 17, 2014.

10. NRC, "Interim Staff Guidance on the Streamlined Review Process for License Renewal for Research Reactors," Washington, DC, October 2009. (ADAMS Accession No. ML092240244)

11. NRC, NUREG/BR-0058, Rev. 4, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," Washington, DC, September 2004. (ADAMS Accession No. ML042820192)

12. NRC, NUREG/CR-4627, Rev. 2, "Generic Cost Estimates," Washington, DC, January 1992. (ADAMS Accession No. ML13137A259)

13. Office of Management and Budget, Circular A-4, "Regulatory Analysis," Washington, DC, September 17, 2003.

Appendix A: Backfitting and Issue Finality

The NRC's backfitting provisions for reactors are found in 10 CFR 50.109. The regulatory basis for § 50.109 was expressed solely in terms of nuclear power reactors. For example, the NRC's Advanced Notice of Proposed Rulemaking, Policy Statement, Proposed Rule, and Final Rule for § 50.109 each had the same title: "Revision of Backfitting Process for Power Reactors" (48 Fed. Reg. 44217 (Sept. 28, 1983), 48 Fed. Reg. 44173 (Sept. 28, 1983), 49 Fed. Reg. 47034 (Nov. 30, 1984), and 50 Fed. Reg. 38097 (Sept. 20, 1985), respectively). As a result, the NRC has not applied § 50.109 to research reactors, testing facilities, and other non-power facilities licensed under part 50 (e.g., "Final Rule; Limiting the Use of Highly Enriched Uranium in Domestically Licensed Research and Test Reactors," 51 Fed. Reg. 6514 (Mar. 27, 1986); "Final Rule; Clarification of Physical Protection Requirements at Fixed Sites," 58 Fed. Reg. 13699 (Mar. 15, 1993)). In a 2012 final rule concerning non-power reactors, the NRC stated, "The NRC has determined that the backfit provisions in § 50.109 do not apply to test, research, or training reactors because the rulemaking record for § 50.109 indicates that the Commission intended to apply this provision to only power reactors, and NRC practice has been consistent with this rulemaking record" ("Final Rule; Requirements for Fingerprint-Based Criminal History Records Checks for Individuals Seeking Unescorted Access to Non-Power Reactors," 77 Fed. Reg. 27561, 27572 (May 11, 2012)).

Under proposed § 50.2, "NPUFs" would include non-power reactors, testing facilities, or other non-power production or utilization facilities licensed in accordance with §§ 50.21(a) or (c) (Section 104a or c of the AEA) or § 50.22 (Section 103 of the AEA). Because the term "NPUF" would include licensees that are excluded from the scope of § 50.109, NPUFs would not fall within the scope of § 50.109. Because § 50.109 does not apply to NPUFs, and this proposed rule would apply to NPUFs, the NRC did not apply § 50.109 to this proposed rule.

Although NPUF licensees are not protected by § 50.109, for those NPUFs licensed under the authority of Section 104 of the AEA, the Commission is directed to impose the minimum amount of regulation on the licensee consistent with its obligations under the AEA to promote the common defense and security, protect the health and safety of the public, and permit the conduct of widespread and diverse research and development and the widest amount of effective medical therapy possible.

Appendix B: Detailed Cost and Cost Savings Build-up

This section presents the inputs used in the estimation process. The assumptions section provides an explanation of the assumptions used in the estimation process. The exhibits below detail the implementation and operation costs and the benefits of the proposed rule. It is important to note that the hours and workload percentages in the exhibits below are the expected values of the assigned distributions. For this reason, the estimates in the exhibits are rounded to the nearest digit and not beyond. This leads to input estimates which could be misinterpreted as highly specific (i.e., the NRC estimates that process step 1 took 33 hours for a Low category facility). Instead, the values should be read as the means of the distributions applied to the process steps.

Assumptions:

1. Of the 31 existing NPUFs, 30 would be subject to non-expiring licenses. One NPUF would continue to undergo license renewal, but would incur costs for updating and submitting FSARs every five years (see Assumption 12).
2. These facilities fall into different categories (Low, Medium, and High) based on their power levels. See Exhibit 3-1.
3. Fourteen facilities fall into Group 1, 13 facilities fall into Group 2, and 4 facilities fall into Group 3. See Exhibit 3-2.
4. Implementation costs would be incurred in 2019 and operational costs would be incurred beginning in 2020.
5. Group 1 facilities are assumed to begin incurring operational costs in 2020, Group 2 in 2021, and Group 3 in 2022.
6. Each facility would incur a one-time implementation cost (which vary based on category) to develop and implement actions based on the proposed rule.
7. The NRC would incur a one-time implementation cost to implement the rule and train staff.
8. Each facility would incur ongoing operational costs derived from the proposed rule requirement to submit updated FSARs. The cost of the FSAR updates varies by category.
9. Facility operational costs (FSAR updates) would be incurred every five years. The timing of FSAR submittals depends on the group to which the facility belongs (See Assumption (5)).
10. The NRC would incur operational costs to review licensee-submitted FSAR updates in the year of submission. The NRC operational costs begin in 2020 and mirror facility operational costs (every five years and staggered by group).
11. Estimates of LOE are based on the NRC staff's professional judgment and licensee input.
12. The NIST facility would continue to go through the existing license renewal process as well as be tasked with submitting updated FSARs. This assumption results in no averted costs for this facility.
13. The Aerotest facility is currently not operational, but is included here only for the purposes of the regulatory analysis. The Commission has made no determination whether the facility will begin operations in time for the implementation of the rule (by 2019).
14. Both GE and Aerotest are assumed to not have averted costs of the rule because the license renewal process for these facilities would not come due during the time period of this analysis. Therefore, the averted costs for these facilities is zero.

Exhibit B-1. Description of Existing NPUF License Renewal Process Substeps

Existing Process Steps	Substep	Description of Substep
Preparing License Renewal Application	**1**	Collect information for narrative components of license renewal application
	2	Draft narrative chapters of license renewal application
	3	Collect information for technical components of license renewal application
	4	Draft technical chapters of license renewal application
	5	Review by management
Responding to RAI Set #1	**1**	Review RAIs
	2	Collect information
	3	Draft RAI responses
	4	Review by management
Responding to Additional RAIs	**1**	Review RAIs, collect information, draft responses, and review by management
Revising License Renewal Application	**1**	Review, collect information, and conduct additional analyses
	2	Revise license renewal application
	3	Review by management

Exhibit B-2. Description of Post-Rule FSAR Process Substeps

Post-Rule Process Steps	Substep	Description of Substep
NPUFs		
Preparing Updated FSAR	**1**	Collect and review recent annual reports
	2	Collect and review other information regarding updates to facility (e.g., license amendments, Section 50.59 analyses)
	3	Draft updates to narrative chapters
	4	Draft updates to technical chapters
	5	Review by management and submittal
Preparing 2nd Updated FSAR	**1**	Collect and review recent annual reports
	2	Collect and review other information regarding updates to facility (e.g., license amendments, 50.59 analyses)
	3	Draft updates to narrative chapters
	4	Draft updates to technical chapters
	5	Review by management and submittal
NRC		
Reviewing Updated FSAR	**1**	Conduct initial review
	2	Review narrative sections
	3	Review technical sections
	4	Review by management
Reviewing 2nd Updated FSAR	**1**	Conduct initial review
	2	Review narrative sections
	3	Review technical sections
	4	Review by management

Exhibit B-3a. NPUF Averted Costs of the Proposed Rule

Existing Process Steps	Sub step	Cost Inputs								Cost per Category		
		Labor Category or Input	Hours per Category			Rate	Workload			Low	Medium	High
			Low	Medium	High		Low	Medium	High			
NPUF Averted Costs												
Preparing License Renewal Application	**1**	Reactor Director / Professor	33	63	65	$49.81	10%	10%	80%	$324	$623	$5,181
		NPUF Operator / Asst. Dir.				$40.18	0%	0%	10%	$0	$0	$522
		Nuclear Technician				$37.10	0%	0%	10%	$0	$0	$482
		Graduate Student				$16.08	90%	90%	0%	$941	$1,809	$0
		Institution Administrator				$49.77	0%	0%	0%	$0	$0	$0
	2	Reactor Director / Professor	228	438	455	$49.81	15%	15%	80%	$3,400	$6,538	$36,265
		NPUF Operator / Asst. Dir.				$40.18	0%	0%	10%	$0	$0	$3,656
		Nuclear Technician				$37.10	0%	0%	10%	$0	$0	$3,376
		Graduate Student				$16.08	85%	85%	0%	$6,220	$11,961	$0
		Institution Administrator				$49.77	0%	0%	0%	$0	$0	$0
	3	Reactor Director / Professor	33	63	65	$49.81	10%	10%	80%	$324	$623	$5,181
		NPUF Operator / Asst. Dir.				$40.18	0%	0%	10%	$0	$0	$522
		Nuclear Technician				$37.10	0%	0%	10%	$0	$0	$482
		Graduate Student				$16.08	90%	90%	0%	$941	$1,809	$0
		Institution Administrator				$49.77	0%	0%	0%	$0	$0	$0

Existing Process Steps	Sub step	Cost Inputs								Cost per Category		
		Labor Category or Input	Hours per Category			Rate	Workload			Low	Medium	High
			Low	Medium	High		Low	Medium	High			
NPUF Averted Costs												
	4	Reactor Director / Professor	325	625	650	$49.81	30%	30%	80%	$9,714	$18,680	$51,807
		NPUF Operator / Asst. Dir.				$40.18	0%	0%	10%	$0	$0	$5,223
		Nuclear Technician				$37.10	0%	0%	10%	$0	$0	$4,823
		Graduate Student				$16.08	70%	70%	0%	$7,317	$14,072	$0
		Institution Administrator				$49.77	0%	0%	0%	$0	$0	$0
	5	Reactor Director / Professor	33	63	65	$49.81	25%	25%	25%	$809	$1,557	$1,619
		NPUF Operator / Asst. Dir.				$40.18	0%	0%	0%	$0	$0	$0
		Nuclear Technician				$37.10	0%	0%	0%	$0	$0	$0
		Graduate Student				$16.08	0%	0%	0%	$0	$0	$0
		Institution Administrator				$49.77	75%	75%	75%	$2,426	$4,666	$4,853
Responding to RAI Set #1	**1**	Reactor Director / Professor	13	13	10	$49.81	25%	25%	10%	$311	$311	$103
		NPUF Operator / Asst. Dir.				$40.18	0%	0%	45%	$0	$0	$372
		Nuclear Technician				$37.10	0%	0%	45%	$0	$0	$344
		Graduate Student				$16.08	75%	75%	0%	$302	$302	$0
		Institution Administrator				$49.77	0%	0%	0%	$0	$0	$0
	2	Reactor Director / Professor	38	38	31	$49.81	25%	25%	10%	$934	$934	$308

Existing Process Steps	Sub step	Cost Inputs								Cost per Category		
		Labor Category or Input	Hours per Category			Rate	Workload			Low	Medium	High
			Low	Medium	High		Low	Medium	High			
NPUF Averted Costs												
		NPUF Operator / Asst. Dir.				$40.18	0%	0%	45%	$0	$0	$1,117
		Nuclear Technician				$37.10	0%	0%	45%	$0	$0	$1,032
		Graduate Student				$16.08	75%	75%	0%	$905	$905	$0
		Institution Administrator				$49.77	0%	0%	0%	$0	$0	$0
	3	Reactor Director / Professor	50	50	41	$49.81	25%	25%	10%	$1,245	$1,245	$410
		NPUF Operator / Asst. Dir.				$40.18	0%	0%	45%	$0	$0	$1,490
		Nuclear Technician				$37.10	0%	0%	45%	$0	$0	$1,376
		Graduate Student				$16.08	75%	75%	0%	$1,206	$1,206	$0
		Institution Administrator				$49.77	0%	0%	0%	$0	$0	$0
	4	Reactor Director / Professor	25	25	21	$49.81	25%	25%	10%	$623	$623	$205
		NPUF Operator / Asst. Dir.				$40.18	0%	0%	45%	$0	$0	$745
		Nuclear Technician				$37.10	0%	0%	45%	$0	$0	$688
		Graduate Student				$16.08	75%	75%	0%	$603	$603	$0
		Institution Administrator				$49.77	0%	0%	0%	$0	$0	$0
Responding to Additional RAIs	**1**	Reactor Director / Professor	528	528	528	$49.81	25%	25%	10%	$13,138	$13,138	$5,255
		NPUF Operator / Asst. Dir.				$40.18	0%	0%	45%	$0	$0	$19,075

Existing Process Steps	Sub step	Cost Inputs								Cost per Category		
		Labor Category or Input	Hours per Category			Rate	Workload			Low	Medium	High
			Low	Medium	High		Low	Medium	High			
NPUF Averted Costs												
		Nuclear Technician				$37.10	0%	0%	45%	$0	$0	$17,612
		Graduate Student				$16.08	75%	75%	0%	$12,725	$12,725	$0
		Institution Administrator				$49.77	0%	0%	0%	$0	$0	$0
Revising License Renewal Application	**1**	Reactor Director / Professor	100	100	100	$49.81	25%	25%	10%	$2,491	$2,491	$996
		NPUF Operator / Asst. Dir.				$40.18	0%	0%	45%	$0	$0	$3,616
		Nuclear Technician				$37.10	0%	0%	45%	$0	$0	$3,339
		Graduate Student				$16.08	75%	75%	0%	$2,412	$2,412	$0
		Institution Administrator				$49.77	0%	0%	0%	$0	$0	$0
	2	Reactor Director / Professor	850	850	850	$49.81	25%	25%	10%	$21,171	$21,171	$8,468
		NPUF Operator / Asst. Dir.				$40.18	0%	0%	45%	$0	$0	$30,736
		Nuclear Technician				$37.10	0%	0%	45%	$0	$0	$28,379
		Graduate Student				$16.08	75%	75%	0%	$20,505	$20,505	$0
		Institution Administrator				$49.77	0%	0%	0%	$0	$0	$0
	3	Reactor Director / Professor	50	50	50	$49.81	25%	25%	25%	$1,245	$1,245	$1,245
		NPUF Operator / Asst. Dir.				$40.18	0%	0%	0%	$0	$0	$0
		Nuclear Technician				$37.10	0%	0%	0%	$0	$0	$0

Existing Process Steps	Sub step	Cost Inputs								Cost per Category		
		Labor Category or Input	Hours per Category			Rate	Workload			Low	Medium	High
			Low	Medium	High		Low	Medium	High			
NPUF Averted Costs												
		Graduate Student				$16.08	0%	0%	0%	$0	$0	$0
		Institution Administrator				$49.77	75%	75%	75%	$3,733	$3,733	$3,733
Total NPUF Operation Cost (Per NPUF)										$115,965	$145,887	$254,635
Number of NPUFs										5	9	14
Total NPUF Cost per Category										$579,823	$1,312,980	$3,564,896
Total NPUF Averted Cost										$5,457,699		

NOTE: NIST, Aerotest, and GE are assumed to not have averted costs. Therefore, the number of licensees is not 5, 11, and 15 as per Exhibit 3-1.

Exhibit B-3b. Averted Costs of the Proposed Rule

Existing License Renewal Costs	Cost Inputs		
	Cost per Category		
	Low	Medium	High
NRC Averted Costs			
Minimum Cost Per NPUF	$145,490	$176,912	$187,122
Maximum Cost Per NPUF	$300,072	$693,708	$774,225
Average Cost Per NPUF	$222,781	$447,355	$482,933
Number of NPUFs	5	9	14
Total Cost per Category	**$1,113,905**	**$4,026,192**	**$6,761,060**
Total NRC Averted Cost	**$11,901,156**		

NOTE: NIST, Aerotest, and GE are assumed to not have averted costs. Therefore, the number of licensees is not 5, 11, and 15 as per Exhibit 3-1.

Exhibit B-4a. NPUF Implementation Costs of the Proposed Rule

Post-Rule Process Steps	Cost Inputs								Cost per Category		
	Labor Category or Input	Hours per Category			Rate	Workload			Low	Medium	High
		Low	Medium	High		Low	Medium	High			
NPUF Implementation (One-Time) Costs											
Reviewing Finalized Rule	Reactor Director / Professor	12	12	12	$49.81	80%	80%	50%	$956	$956	$598
	NPUF Operator / Asst. Dir.				$40.18	0%	0%	25%	$0	$0	$241
	Nuclear Technician				$37.10	0%	0%	25%	$0	$0	$223
	Graduate Student				$16.08	20%	20%	0%	$77	$77	$0
	Institution Administrator				$49.77	0%	0%	0%	$0	$0	$0

Post-Rule Process Steps	Cost Inputs								Cost per Category		
	Labor Category or Input	Hours per Category			Rate	Workload			Low	Medium	High
		Low	Medium	High		Low	Medium	High			
NPUF Implementation (One-Time) Costs											
Reviewing NRC Issued Guidance Documents	Reactor Director / Professor	12	12	12	$49.81	80%	80%	50%	$956	$956	$598
	NPUF Operator / Asst. Dir.				$40.18	0%	0%	25%	$0	$0	$241
	Nuclear Technician				$37.10	0%	0%	25%	$0	$0	$223
	Graduate Student				$16.08	20%	20%	0%	$77	$77	$0
	Institution Administrator				$49.77	0%	0%	0%	$0	$0	$0
Reviewing and Updating Procedures	Reactor Director / Professor	24	24	24	$49.81	50%	50%	33%	$1,196	$1,196	$796
	NPUF Operator / Asst. Dir.				$40.18	0%	0%	33%	$0	$0	$643
	Nuclear Technician				$37.10	0%	0%	33%	$0	$0	$594
	Graduate Student				$16.08	50%	50%	0%	$386	$386	$0
	Institution Administrator				$49.77	0%	0%	0%	$0	$0	$0
Safety Review Board	Reactor Director / Professor	7	7	7	$49.81	50%	50%	50%	$349	$349	$349
	NPUF Operator / Asst. Dir.				$40.18	0%	0%	0%	$0	$0	$0
	Nuclear Technician				$37.10	0%	0%	0%	$0	$0	$0
	Graduate Student				$16.08	0%	0%	0%	$0	$0	$0
	Institution Administrator				$49.77	50%	50%	50%	$348	$348	$348
Total NPUF One-Time Cost (per NPUF)									$4,346	$4,346	$4,853
Number of NPUFs									5	11	15

Post-Rule Process Steps	Cost Inputs								Cost per Category		
	Labor Category or Input	Hours per Category			Rate	Workload			Low	Medium	High
		Low	Medium	High		Low	Medium	High			
NPUF Implementation (One-Time) Costs											
Total NPUF One-Time Cost									$21,729	$47,804	$72,798
									$142,331		

Exhibit B-4b. NPUF Operation Costs of the Proposed Rule

Post-Rule Process Steps	Cost Inputs								Cost per Category		
	Labor Category or Input	Hours per Category			Rate	Workload			Low	Medium	High
		Low	Medium	High		Low	Medium	High			
NPUF Operation (Ongoing) Costs											
Preparing Updated FSAR	Reactor Director / Professor	85	127.5	197.5	$49.81	25%	25%	15%	$2,117	$3,176	$2,951
	NPUF Operator / Asst. Dir.				$40.18	0%	0%	35%	$0	$0	$5,555
	Nuclear Technician				$37.10	0%	0%	35%	$0	$0	$5,129
	Graduate Student				$16.08	60%	60%	0%	$1,640	$2,461	$0
	Institution Administrator				$49.77	15%	15%	15%	$1,269	$1,904	$2,949
Preparing for Review Related Inspection	Reactor Director / Professor	4	9	14	$49.81	50%	50%	33%	$199	$448	$460
	NPUF Operator / Asst. Dir.				$40.18	0%	0%	34%	$0	$0	$377
	Nuclear Technician				$37.10	0%	0%	34%	$0	$0	$348
	Graduate Student				$16.08	50%	50%	0%	$64	$145	$0

Post-Rule Process Steps	Cost Inputs								Cost per Category		
	Labor Category or Input	Hours per Category			Rate	Workload			Low	Medium	High
		Low	Medium	High		Low	Medium	High			
NPUF Operation (Ongoing) Costs											
	Institution Administrator				$49.77	0%	0%	0%	$0	$0	$0
Participating in Review Related Inspection	Reactor Director / Professor	2	2	3	$49.81	50%	50%	33%	$100	$100	$99
	NPUF Operator / Asst. Dir.				$40.18	0%	0%	34%	$0	$0	$81
	Nuclear Technician				$37.10	0%	0%	34%	$0	$0	$75
	Graduate Student				$16.08	50%	50%	0%	$32	$32	$0
	Institution Administrator				$49.77	0%	0%	0%	$0	$0	$0
Participating in Exit Meeting	Reactor Director / Professor	0	0	0	$49.81	50%	50%	33%	$0	$0	$0
	NPUF Operator / Asst. Dir.				$40.18	0%	0%	34%	$0	$0	$0
	Nuclear Technician				$37.10	0%	0%	34%	$0	$0	$0
	Graduate Student				$16.08	50%	50%	0%	$0	$0	$0
	Institution Administrator				$49.77	0%	0%	0%	$0	$0	$0
Total NPUF Operation Cost (Per NPUF)									$5,422	$8,265	$18,023
Number of NPUFs									5	11	15
Total NPUF Operation Cost per FSAR Update (Every 4 Years)									$27,110	$90,912	$270,341
									$388,363		
Total NPUF Operations Cost in analysis period (20 years)									$1,553,453		

Exhibit B-4c. NRC Implementation Costs of the Proposed Rule

Post-Rule Process Steps	Cost Inputs						Cost per Category		
	Labor Category or Input	Hours per Category			Rate	Workload	Low	Medium	High
		Low	Medium	High					
NRC Implementation (One-Time) Costs									
Finalizing Rulemaking	FY17 FOL				1.5	100%	$678,000		
	FY17 ($k)				$405,000	100%			
	NRC Annual Wage Rate				$182,000	100%			
Developing Guidance on revised License Renewal Process	NRC Staff	150			$130/hr	100%	$19,485		
Issue Orders to Remove License Terms	NRC Staff	80			$130/hr	100%	$10,392		
Training NRC Staff	NRC Staff	116			$130/hr	100%	$15,069		
Updating Project Manager Qualification Program	NRC Staff	12			$130/hr	100%	$1,559		
Total NRC Implementation Cost							$724,505		

Exhibit B-4d. NRC Operation Costs of the Proposed Rule

Post-Rule Process Steps	Cost Inputs						Cost per Category		
	Labor Category or Input	Hours per Category			Rate	Workload	Low	Medium	High
		Low	Medium	High					
NRC Operations (per FSAR Update) Costs									
Reviewing Updated FSAR	NRC Staff	6	8	10	$130/hr	100%	$779	$1,039	$1,299
	NRC Staff	18	24	30	$130/hr	100%	$2,338	$3,118	$3,897
	NRC Staff	24	32	40	$130/hr	100%	$3,118	$4,157	$5,196

Post-Rule Process Steps	Cost Inputs						Cost per Category		
	Labor Category or Input	Hours per Category			Rate	Workload	Low	Medium	High
		Low	Medium	High					
NRC Operations (per FSAR Update) Costs									
	NRC Staff	12	16	20	$130/hr	100%	$1,559	$2,078	$2,598
Preparing for Review Related Inspection Activities	NRC Staff	0	6	12	$130/hr	100%	$0	$779	$1,559
Completing Review Related Inspection	NRC Staff	0	6	12	$130/hr	100%	$0	$779	$1,559
Closing Review Related Inspection Activities	NRC Staff	0	6	12	$130/hr	100%	$0	$779	$1,559
Total NRC Operations Cost (per FSAR Update)							$7,794	$12,730	$17,667
Number of NPUFs							5	11	15
Rounds of FSAR Updates							4		
Total NRC Operations Cost in analysis period (20 years)							$1,776,012		

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REGULATORY RESEARCH

March 2017
Division 2

DRAFT REGULATORY GUIDE

Technical Lead
Duane Hardesty

DRAFT REGULATORY GUIDE DG-2006

(Proposed New Regulatory Guide)

PREPARATION OF UPDATED FINAL SAFETY ANALYSIS REPORTS FOR NON-POWER PRODUCTION OR UTILIZATION FACILITIES

A. INTRODUCTION

Purpose

This regulatory guide (RG) provides licensees of non-power production or utilization facilities (NPUFs) with a method that the staff of the U.S. Nuclear Regulatory Commission (NRC) considers acceptable for use in updating facility final safety analysis reports (FSARs).

Applicability

This RG applies to NPUFs licensed under the authority of Section 103, Section 104a, or Section 104c of the Atomic Energy Act of 1954, as amended (AEA), and sections 50.22, 50.21(a), or 50.21(c) of part 50, "Domestic Licensing of Production and Utilization Facilities," of Title 10 of the *Code of Federal Regulations* (10 CFR) (Ref. 1).

Applicable Regulations

- 10 CFR part 50, "Domestic Licensing of Production and Utilization Facilities"
    - Section 50.71(e)(3)(iv) states, "For non-power production or utilization facility licenses issued after [EFFECTIVE DATE OF FINAL RULE], a revision of the original FSAR must be filed within 5 years of the date of issuance of the operating license. The revision must bring the FSAR up to date as of a maximum of 6 months prior to the date of filing the revision."
    - Section 50.71(e)(4)(ii) states, "Non-power production or utilization facility licensees shall file subsequent FSAR updates at intervals not to exceed 5 years. Each update must

This regulatory guide is being issued in draft form to involve the public in the development of regulatory guidance in this area. It has not received final staff review or approval and does not represent an NRC final staff position. Public comments are being solicited on this draft guide and its associated regulatory analysis. Comments should be accompanied by appropriate supporting data. Comments may be submitted through the Federal-rulemaking Web site, http://www.regulations.gov, by searching for Docket ID NRC-2011-0087. Alternatively, comments may be submitted to the Rules, Announcements, and Directives Branch, Office of Administration, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Comments must be submitted by the date indicated in the *Federal Register* notice.

Electronic copies of this draft regulatory guide, previous versions of this guide, and other recently issued guides are available through the NRC's public Web site under the Regulatory Guides document collection of the NRC Library at http://www.nrc.gov/reading-rm/doc-collections/reg-guides/. The draft regulatory guide is also available through the NRC's Agencywide Documents Access and Management System (ADAMS) at http://www.nrc.gov/reading-rm/adams.html, under Accession No. ML17068A041. The regulatory analysis may be found in ADAMS under Accession No. ML17068A038.

reflect all changes made to the FSAR up to a maximum of 6 months prior to the date of filing the update."

Related Guidance

- NUREG-1537, Part 1, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors: Format and Content" (Ref. 2), provides guidance for applicants preparing license applications for NPUFs.

- NUREG-1537, Part 2, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors: Standard Review Plan and Acceptance Criteria" (Ref. 3), provides guidance on the NRC's review of license applications.

Purpose of Regulatory Guides

The NRC issues RGs to describe to the public methods that the staff considers acceptable for use in implementing specific parts of the agency's regulations, to explain techniques that the staff uses in evaluating specific problems or postulated events, and to provide guidance to applicants. Regulatory guides are not substitutes for regulations, and compliance with them is not required. Methods and solutions that differ from those set forth in RGs will be deemed acceptable if they provide a basis for the findings required for the issuance or continuance of a permit or license by the Commission.

Paperwork Reduction Act

This RG contains and references information collections covered by 10 CFR part 50 that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). These information collections were approved by the Office of Management and Budget (OMB), control number 3150-0011.

Public Protection Notification

The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid OMB control number.

B. DISCUSSION

Reason for Issuance

This RG provides implementing guidance for a rulemaking that established a requirement for NPUF licensees to submit an updated FSAR every five years. Periodic updates to FSARs provide a mechanism for incorporating design and operational changes into the licensing basis as they occur. As a result, NPUF licensees will routinely update their licensing bases, and NRC staff will be made aware of changes to the licensing bases more frequently than prior to the rulemaking.

Background

This RG describes the information that should be included in submittals of FSAR revisions for NPUFs to comply with the applicable parts of 10 CFR 50.71(e). Each submittal serves to reflect changes and the effects of changes to the design basis and to assure that the information included in the FSAR contains the latest information developed by the licensee. The FSAR (as updated) helps both the NPUF licensee and the NRC ensure that the facility design and licensing bases are current. This also helps provide reasonable assurance that a facility will continue to operate without undue risk to public health and safety or the environment.

Role of the FSAR (as updated)

Once the NRC issues a license for a nuclear facility, the licensee must operate the facility in compliance with its license. Because the facility's design and operation are not static, certain changes may be necessary over the course of facility life. Licensees are required to follow NRC regulations to justify and implement any changes and the effects of changes to the design basis and licensing basis. The FSAR (as updated) provides the NRC with current design and licensing bases for a facility that is needed by the NRC in its regulatory oversight of NPUF licensees, including its use as a reference for evaluating license amendment requests and in preparation for and conduct of inspection and operator examination activities.

The NRC licensee has primary responsibility for operating its facility safely and in compliance with its license. This responsibility includes maintaining an up to date facility design basis and facility licensing basis. The FSAR (as updated) also serves to provide the general public a description of the facility and its operation.

Harmonization with International Standards

The International Atomic Energy Agency (IAEA) has established a series of specific safety guides (SSG) and Technical Documents (TECDOC) promoting a high level of safety for protecting people and the environment. These documents present international good practices and increasingly reflect best practices to help users striving to achieve high levels of safety. With respect to this RG, IAEA Specific Safety Guide, No. SSG-10, "Aging Management for Research Reactors" (Ref. 4), addresses aging considerations in different stages of the lifetime of a research reactor. The IAEA TECDOC-792, "Management of Research Reactor Aging" (Ref. 5), provides to research reactor operators a guide to understanding the behavior and influence of aging mechanisms on reactor structures, systems and components; how to detect and assess the effects of aging; and preventive and corrective measures to mitigate these effects. While the NRC has an interest in facilitating the harmonization of standards used domestically and internationally, the agency does not specifically endorse SSG-10 or TECDOC-792 and is only acknowledging that these documents may be a useful reference for general information. The NRC

could consider the use of international standards in a licensing action following adequate justification by a licensee or applicant and technical review by the NRC.

C. STAFF REGULATORY GUIDANCE

1. Content of the FSAR (as updated)

   a. The scope of information provided through the update process should be guided by requirements for establishing the original safety analysis report in 10 CFR 50.34 and submitting periodic updates to the FSAR in 10 CFR 50.71, as augmented by the guidance of NUREG-1537, Part 1. The updated information should include all the changes necessary to reflect information and analyses prepared by the licensee since submittal of the original FSAR or, as appropriate, the last update to the FSAR. This includes any information provided in the special reports and annual reports to the NRC that requires changes to the FSAR and any information and analysis that support a licensing action (e.g., a license amendment) during the 5-year period between FSARs (as updated), such as:

      i. Changes to the facility or facility operations resulting from new or amended regulatory requirements.

      ii. Changes and the effects of changes to the facility or procedures and new experiments to assure the information included in the FSAR (as updated) contains the latest information developed. NPUF licensees are required by Technical Specification to make operating reports (annually) and special reports (as required). These reports should be reviewed by the licensee to determine what information should be included in the FSAR revisions submitted to the NRC to meet the requirements of 10 CFR 50.71(e). Examples include:

         1. Licensee evaluations performed under 10 CFR 50.59, "Changes, tests, and experiments," which result in changes to the FSAR. For example:

            a. Evaluation of major preventive or corrective maintenance operations to safety-related items that may have required facility modifications (e.g., replacing a safety-related analog meter with a digital readout; replacing a safety-related pump with one with increased flow when the flow is an analyzed condition in the FSAR; or changes to electrical and instrumentation and control drawings in the FSAR); or

            b. Evaluation of changes in the facility and procedures, new tests or classes of experiments not previously analyzed or described in the FSAR.

         2. Licensee evaluations performed under 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit."

         3. Licensee responses to NRC requests for additional information (RAI) which result in changes to the FSAR (e.g., during license renewal, relicensing or the amendment process).

         4. Evaluations of significant changes in the nature and amount of radioactive effluents released or discharged beyond the effective control of the licensee that effect the conclusions in the NRC's Environmental Impact Statement (EIS) or Environmental Assessment (EA) for the facility.

         5. Evaluations of environmental surveys performed outside the facility for significant trends that affect the conclusions in the NRC's EIS or EA for the facility.

6. Evaluations of potential facility aging to safety-related items and any aging management actions taken (e.g., repair of pool liner leakage, abandonment of underground piping).

7. Evaluations of changes in the facility site environs (e.g., new industrial, transportation or residential facilities near the facility site or changes in the population potentially exposed to facility releases).

8. Any licensee regulatory commitment made in licensee special reports that requires changes to the FSAR.

b. Licensees are generally not expected to update historical information unless the licensee becomes aware of significant changes in the facility site environs. Historical information includes such material as data obtained to support or develop the original facility design basis related to natural phenomena such as geography, meteorology, geology, and seismology.

c. As part of the FSAR update process, licensees should remove obsolete information from the FSAR, such as structures, systems and components that are no longer installed in the facility and evaluations or other descriptions that no longer apply to the facility as described in the FSAR. The information removed from the FSAR as part of the update process should be identified and reported to the NRC with a basis for the licensee's determination that such information should be removed.

d. Pending licensing actions (e.g., approval of a license amendment request) need not be included if the licensing action requested has not been completed within 6 months of the date the FSAR (as updated) is required to be filed.

e. The NRC staff will review the updates to the FSAR in accordance with the criteria contained in NUREG-1537, Part 2.

2. Format of the FSAR (as updated)

a. The format of the FSAR (as updated) is at the discretion of the licensee and should generally follow the format guidance in NUREG-1537, Part 1.

b. The FSAR (as updated) should highlight the changed portion on each page, including the contents page. A summary of changes should accompany the FSAR (as updated).

3. Submittal of the FSAR (as updated)

   a. The FSAR (as updated) shall be submitted in accordance with 10 CFR 50.71(e)(2) which requires that the submitted FSAR include: (1) a certification by a duly authorized officer of the licensee that either the information accurately presents changes made since the previous submittal, necessary to reflect information and analyses submitted to the Commission or prepared pursuant to Commission requirement, or that no such changes were made; and (2) an identification of changes made under the provisions of Section 50.59 but not previously submitted to the Commission.

   b. The FSAR (as updated) must be submitted in accordance with 10 CFR 50.4, "Written communications." Where practicable, licensees should electronically submit the entire document, for example via Electronic Information Exchange, e-mail, or CD-ROM. As specified in paragraph (a), "General requirements," of 10 CFR 50.4, "Electronic submissions must be made in a manner that enables the NRC to receive, read, authenticate, distribute, and archive the submission, and process and retrieve it a single page at a time. Detailed guidance on making electronic submissions can be obtained by visiting the NRC's Web site at http://www.nrc.gov/site-help/e-submittals.html; by e-mail to MSHD.Resource@nrc.gov; or by writing the Office of the Chief Information Officer, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001. The guidance discusses, among other topics, the formats the NRC can accept, the use of electronic signatures, and the treatment of nonpublic information."

   c. Information included in the FSAR (as updated) that is considered sensitive or proprietary, that the licensee seeks to have withheld from the public, must be marked in accordance with 10 CFR 2.390, "Public inspections, exemptions, requests for withholding" (Ref. 6). Any information related to security must be submitted in accordance with 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements" (Ref. 7).

D. IMPLEMENTATION

The purpose of this section is to provide information on how applicants and licensees may use this guide and information regarding the NRC's plans for using this RG.

Applicants and licensees may use the guidance in this document to demonstrate compliance with the underlying NRC regulations. Methods or solutions that differ from those described in this RG may be deemed acceptable if they provide sufficient basis and information for the NRC staff to verify that the proposed alternative demonstrates compliance with the appropriate NRC regulations. Current licensees may continue to use guidance that the NRC has found acceptable for complying with the identified regulations as long as their current licensing basis remains unchanged**.**

Licensees may use the information in this RG for actions that do not require NRC review and approval. Licensees may use the information in this RG or applicable parts to resolve regulatory or inspection issues.

The NPUF licensees are not protected by the backfitting provisions in 10 CFR 50.109. The NRC staff may discuss with licensees various actions consistent with staff positions in this RG, as one acceptable means of meeting the underlying NRC regulatory requirement. However, unless this RG is part of the licensing basis for a facility, the NRC staff may not represent to the licensee that the licensee's failure to comply with the positions in this RG constitutes a violation.

GLOSSARY

Notwithstanding the definitions in 10 CFR Chapter I, for the purposes of this guide, the following definitions (derived from the referenced documents) apply:

aging Aging is the general process in which characteristics of structures, systems or components (SSC) change with use or time which eventually leads to degradation of materials subjected to normal service conditions, including normal operation and transient conditions under which the SSC is required to operate (derived from Ref. 5).

aging management Aging management is engineering, operations, and maintenance actions to control, within acceptable limits, aging degradation and wear of SSCs, including timely detection and mitigation (derived from Ref. 4).

change Change means a modification or addition to, or removal from the facility or procedures, that affects a design function, method of performing or controlling the function, or an evaluation that demonstrates that intended functions will be accomplished (derived from Ref. 8).

design bases Design bases means that information which identifies the specific functions to be performed by a structure, system, or component of a facility, and the specific values or ranges of values chosen for controlling parameters as reference bounds for design. These values may be (1) restraints derived from generally accepted "state of the art" practices for achieving functional goals, or (2) requirements derived from analysis (based on calculation and/or experiments) of the effects of a postulated accident for which a structure, system, or component must meet its functional goals (derived from Ref. 9).

effects of changes Effects of changes include appropriate revisions of descriptions in the final safety analysis report (FSAR) such that the FSAR (as updated) is complete and accurate (derived from Ref. 10).

facility Facility as described in the FSAR (as updated) means:
(i) The SSCs that are described in the FSAR (as updated);
(ii) The design and performance requirements for such SSCs described in the FSAR (as updated); and
(iii) The evaluations or methods of evaluation included in the FSAR (as updated) for such SSCs which demonstrate that their intended function(s) will be accomplished (derived from Ref. 11).

FSAR (as updated) FSAR (as updated) means the final safety analysis report (or Final Hazards Summary Report) submitted in accordance with 10 CFR 50.34, as amended and supplemented, and as updated per the requirements of Section 50.71(e) (derived from Ref. 12).

historical information Historical information is the information that was accurate at the time the licensee facility was originally licensed that is not expected to be updated for the life of the facility; information that is not affected by changes to the licensee facility or its operation; or information that does not change with time (derived from Ref. 13).

licensing basis The licensing basis for a facility is comprised of selected information exchanged between a licensee and the NRC relating to design features, equipment descriptions, operating practices, site characteristics, programs and procedures, and other factors that describe a facility's design, construction, maintenance and operation. Licensing basis information is contained in a variety of document types (e.g., final safety

	analysis report, license amendments). Each licensing basis document has certain characteristics in terms of change control mechanisms, reporting of changes to the NRC, dealing with discrepancies, and possible involvement of the public (derived from Ref. 14).
non-power production or utilization facility	A non-power production or utilization facility (NPUF) means a non-power reactor, testing facility, or other production or utilization facility, licensed under 10 CFR 50.21(a), 50.21(c) or 50.22 that is not a nuclear power reactor.
obsolete information	Obsolete information is information about safety-related items that has been removed from the licensee facility; programs or procedures which are no longer in effect; or design information, evaluations and FSAR descriptions that no longer apply to the facility (derived from Ref. 12).
safety-related items	Safety-related items are those physical SSCs whose intended functions are to prevent accidents that could cause undue risk to health and safety of workers and the public; and to control or mitigate the consequences of such accidents (derived from Ref. 15).

REFERENCES[1]

1. *U.S. Code of Federal Regulations (CFR),* "Domestic Licensing of Production and Utilization Facilities," part 50, Chapter I, Title 10, "Energy."

2. U.S. Nuclear Regulatory Commission (NRC), "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors: Format and Content," NUREG-1537, Part 1, February 1996, Agencywide Document Access and Management System (ADAMS) accession number ML042430055.

3. NRC, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors: Standard Review Plan and Acceptance Criteria," NUREG-1537, Part 2, February 1996, ADAMS accession number ML042430048.

4. International Atomic Energy Agency (IAEA), "Aging Management for Research Reactors," Specific Safety Guide No. SSG-10, Vienna, Austria, 2010.[2]

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6. *CFR*, "Agency Rules of Practice," part 2, Chapter 1, Title 10, "Energy," Section 2.390, "Public inspections, exemptions, requests for withholding."

7. *CFR*, "Physical Protection of Plants and Materials," part 73, Chapter 1, Title 10, "Energy," Section 73.21, "Protection of Safeguards Information: Performance Requirements."

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9. *CFR,* "Domestic Licensing of Production and Utilization Facilities," part 50, Chapter 1, Title 10, "Energy," Section 50.2, "Definitions."

10. *CFR,* "Domestic Licensing of Production and Utilization Facilities," part 50, Chapter 1, Title 10, Energy, Section 50.71, "Maintenance of records, making of reports," Footnote 1.

11. *CFR,* "Domestic Licensing of Production and Utilization Facilities," part 50, Chapter 1, Title 10, "Energy," Section 50.59(a)(3).

12. *CFR,* "Domestic Licensing of Production and Utilization Facilities," part 50, Chapter 1, Title 10, "Energy," Section 50.59(a)(4).

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[1] Publicly available NRC documents are available electronically through the NRC Library on the NRC's public Web site at http://www.nrc.gov/reading-rm/doc-collections/ and through the NRC's Agencywide Documents Access and Management System (ADAMS) at http://www.nrc.gov/reading-rm/adams.html. The documents can also be viewed online or printed for a fee in the NRC's Public Document Room (PDR) at 11555 Rockville Pike, Rockville, MD. For problems with ADAMS, contact the PDR staff at 301-415-4737 or (800) 397-4209; fax (301) 415-3548; or e-mail pdr.resource@nrc.gov.

[2] Copies of International Atomic Energy Agency (IAEA) documents may be obtained through their Web site: www.IAEA.org/ or by writing the International Atomic Energy Agency, P.O. Box 100 Wagramer Strasse 5, A-1400 Vienna, Austria.

13. Electric Power Research Institute (EPRI) Nuclear Energy Institute (NEI) EPRI/NEI Report No. 98-03, Rev. 1, "Guidance for Updating Final Safety Analysis Reports," Palo Alto, CA, June 1999.[3]

14. EPRI/NEI Report No. 07-06, "Nuclear Regulatory Process," Palo Alto, CA, March 2007.

15. American Nuclear Society, "Quality Assurance Program Requirements for Research Reactors," ANSI/ANS 15.8–1995, LaGrange Park, IL.[4]

[3] Copies of Electric Power Research Institute (EPRI) standards and reports may be purchased from EPRI, 3420 Hillview Ave., Palo Alto, CA 94304; telephone (800) 313-3774; fax (925) 609-1310.

[4] Copies of American National Standards (ANS) may be purchased from the American National Standards Institute (ANSI), 1819 L Street, NW, 6th floor, Washington, DC 20036; telephone: (202) 293-8020). Purchase information is available through the ASCE Web site at http://webstore.ansi.org/ansidocstore/.