



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001**

February 28, 2019

The Honorable Kristine Svinicki  
Chairman  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**SUBJECT: NON-POWER PRODUCTION OR UTILIZATION FACILITIES  
PROPOSED LICENSE RENEWAL RULEMAKING**

Dear Chairman Svinicki:

During the 660<sup>th</sup> meeting of the Advisory Committee on Reactor Safeguards, February 6-8, 2019, we completed our review of the draft final Non-Power Production or Utilization Facilities Proposed License Renewal rulemaking. We had previously reviewed this topic during our 632<sup>nd</sup> meeting of the Committee and issued a letter report, dated March 15, 2016, on the proposed rule. The Research and Test Reactors Subcommittee also reviewed these matters at its meetings on February 3, 2016, and January 23, 2019. During our review, we had the benefit of discussions with representatives of the NRC staff. We also had the benefit of the referenced documents.

**RECOMMENDATION**

The staff should proceed with this rulemaking for license renewal of Non-Power Production or Utilization Facilities.

**BACKGROUND**

The Atomic Energy Act includes considerations for licensing research reactors and testing facilities, as well as considerations for licensing commercial nuclear power reactors. The Atomic Energy Act accords to research reactors and testing facilities special status and specifies that these reactors be subject to minimal regulation consistent with adequate protection of the public health and safety. The current regulatory process for these reactors permits renewable licenses of twenty-year duration. For a variety of reasons, a backlog in the processing of the license renewals has developed. The staff has undertaken a revision of the regulations to avoid recurrence of such a backlog and to improve the safety documentation for the research reactors and testing facilities.

Our original letter report dated March 15, 2016, provides an initial review of the proposed rulemaking prior to the public comment phase of the review process. In the draft proposed rule, the staff proposed nine changes to the regulations:

- Define “Non-power Production or Utilization Facilities” (NPUFs)
- Eliminate license terms for research reactors
- Consolidate license renewal requirements for testing facilities and medical isotope production facilities
- Require NPUF licensees to submit updated final safety analysis reports every five years
- Amend the timely license renewal provision under 10 CFR 2.109, “Effect of timely renewal application”
- Provide an accident dose criterion of 1 rem (0.01 Sievert [Sv]) for NPUFs other than test reactors
- Extend applicability of 10 CFR 50.59, “Changes, tests, and experiments,” to NPUFs regardless of the decommissioning status
- Clarify existing environmental reporting requirements
- Eliminate NPUF financial qualification information requirements for license renewal

We commented on the first seven of these proposed changes in our original letter report and deferred on the final two proposed changes as they are outside our charter and expertise. In that same letter report, we recommended that the staff should proceed with this proposed rulemaking for licensing of NPUFs. The staff has now received public and stakeholder comments on the proposed rule and is recommending material revisions to some of the originally proposed changes. This current letter report documents our review and recommendation on the staff changes to the draft final rule that now addresses the public and stakeholder comments. For completeness, we also discuss significant aspects of the proposed rule from our original letter report.

## **DISCUSSION**

The staff initially proposed to define NPUF as a term that encompasses:

- Research reactors with power of 10 MWt or less if there are no notable safety considerations, and 1 MWt or less if there are notable safety considerations<sup>1</sup>
- Testing facilities with power greater than 10 MWt, or greater than 1 MWt if there are notable safety considerations
- Commercial medical radioisotope irradiation and production facilities

Research reactors typically operate at low pressures and have low inventories of radionuclides. On the other hand, research reactors often have small exclusion area boundaries, and are often located in high population areas. The accident dose criterion found in 10 CFR Part 100 (25 rem (0.25 Sv) total effective dose equivalent (TEDE)) appears inappropriately large for these facilities. The radiation dose limit for individual

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<sup>1</sup>The term, “notable safety considerations,” refers to circulating loops through the reactor core used for fuel experiments, liquid fuel loading, and experimental volumes with cross-sections larger than 16 in<sup>2</sup> (103 cm<sup>2</sup>) in the core.

members of the public (0.1 rem (0.001 Sv) TEDE) established by 10 CFR Part 20 appears unduly restrictive as an accident dose criterion. The staff proposed to adopt the 1 rem (0.01 Sv) TEDE Protective Action Guide defined by the Environmental Protection Agency as an accident dose criterion for research reactors. Testing facilities will remain subject to the 10 CFR Part 100 accident dose criterion.

The staff received public comments on the definitions of “testing facility” and “research reactor.” The staff agreed that “testing facility” and “research reactor” as defined by a threshold of 10 MWt was arbitrary and overly restrictive. Instead, a risk-based approach to regulation of a testing facility would be more appropriate. The staff concluded that the accident dose criterion of 1 rem (0.01 Sv) TEDE be used in the draft final rule to define the threshold between a research reactor and testing facility. The technical basis associated with the 10 MWt threshold, while generally based on safety significance, is not documented. These prescriptive power thresholds do not take into account the safety features that are engineered into the facility design, and therefore, do not accurately represent the risk associated with a particular facility. For these reasons, the use of a calculated accident dose is a more risk-informed, performance-based approach than the power level of the reactor to distinguish between types of NPUFs. In the draft final rule, the staff revises the definitions of “testing facility” and “research reactor” to reflect this approach. We concur.

Upon reviewing public comments, the staff concluded that the draft proposed rule was too broad for defining production facilities that are NPUFs. Previously, the NPUF definition excluded fuel reprocessing plants, but did not address the additionally required exclusion for a production facility designed or used primarily for the formation of plutonium or uranium-233, or designed for the separation of the isotopes of plutonium. In the draft final rule, the staff revises the definition to exclude all production facilities as defined under paragraphs (1) and (2) of the definition of “production facility” in 10 CFR 50.2. We concur.

The staff proposed that research reactors be given licenses that do not expire, once they have renewed their licenses following the guidance provided in NUREG-1537. The NRC will continue to monitor and inspect these reactor facilities as they have in the past and the licensees will remain obligated to report any deviations from technical specifications. Licensees will be required to provide to the NRC, updates to their final safety analysis report every five years. Submission of updates to the final safety analysis report should assure adequate attention to configuration control of the research reactors and that licensees have adequate familiarity with the licensing bases of their facilities. This requirement for systematic and periodic reexamination provides added confidence that changes which may affect safety are identified and managed throughout the life of the facility.

The staff proposed that applications for license renewal be submitted at least two years prior to expiration of the license. This proposal is being made to allow sufficient time for the staff to review the renewal application without complications of license expiration during the review period.

In the draft proposed rule, a renewed license would have been effective 30 days after issuance. The staff has modified the draft proposed rule language, after public comments, to allow for potentially greater flexibility to the licensee regarding the date of issuance. The applicant for the renewed license can propose a schedule for implementation of the renewed license to the extent that additional time is needed to make any necessary and conforming changes to the facility processes and procedures required by the applicable conditions of the renewed license. We concur.

Current wording in the regulations makes 10 CFR 50.59 no longer applicable to NPUFs that have ceased operation and have returned their fuel to the Department of Energy. This has mandated that NRC consider license amendments and add license conditions for decommissioning facilities that are essentially identical to the requirements of 10 CFR 50.59. The staff proposed changes to the regulations that eliminate this additional administrative burden and make 10 CFR 50.59 applicable to NPUFs regardless of decommissioning status.

Licensing terms for testing facilities and for commercial or industrial facilities (e.g., medical radioisotope production facilities) will continue much as they have in the past. The staff proposed to consolidate the regulatory requirements for renewal of these licenses in a new section of the *Code of Federal Regulations*, 10 CFR 50.135.

## CONCLUSION

The staff has developed a practical revision to the licensing process for NPUFs that is well conceived and should serve to reduce administrative challenges that have arisen in the past while preserving the adequate protection of the health and safety of the public.

Sincerely,

**/RA/**

Peter C. Riccardella  
Chairman

## REFERENCES

1. U.S. Nuclear Regulatory Commission, Draft Final Rule, "Final Rulemaking: Non-Power Production and Utilization Facility License Renewal (RIN 3150-A196, NRC-2011-0087)", January 11, 2019 (ML19008A088).
2. U.S. Nuclear Regulatory Commission, Draft SECY Paper, "Proposed Rulemaking: Non-Power Production or Utilization Facility License Renewal (RIN 3150-A196)," February 25, 2016 (ML16055A134).
3. U.S. Environmental Protection Agency, EPA 400/R-17/001, "PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents," January 2017.

4. Advisory Committee on Reactor Safeguards, "Non-Power Production or Utilization Facilities Proposed License Renewal Rulemaking," March 15, 2016 (ML16075A306).
5. U.S. Nuclear Regulatory Commission, NUREG-1537, "Guidelines for Preparing and Reviewing Applications for the Licensing of Non-Power Reactors," February 1996 (ML12251A353).

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