



DEPARTMENT OF ENERGY
NATIONAL NUCLEAR SECURITY ADMINISTRATION
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WASHINGTON DC 20585-1000

NR:RR:NSPlate G#22-05444
November 22, 2022

Secretary, U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
ATTN: Rulemaking and Adjudications Staff

PROPOSED REVISION TO 10CFR71 AND REGULATORY GUIDE 7.9 - PACKAGING AND TRANSPORTATION OF RADIOACTIVE MATERIAL; COMMENTS ON

References: (a) Federal Register, Volume 87, Number 175, dated September 12, 2022

Background: Title 10, Code of Federal Regulations, Part 71 (10CFR71) contains requirements for packaging and transportation of radioactive material. In reference (a), the Nuclear Regulatory Commission (NRC) requested comments on a proposed revision to 10CFR71. The primary purpose for this proposed revision is to ensure harmonization with International Atomic Energy Agency (IAEA) regulations and to maintain consistent regulatory framework with U.S. Department of Transportation regulations. In addition, NRC requested comments on a proposed revision to Regulatory Guide (RG) 7.9 that provides guidance on the format and content of 10CFR71 applications and associated safety analysis reports.

Discussion: Enclosures (1) and (2) contain Naval Reactors (NR) comments on the proposed revisions to 10CFR71 and RG 7.9, respectively. These comments are a result of a collective review in the Naval Nuclear Propulsion Program (NNPP). Particular attention is directed to Issue 10 concerning proposed changes to the transitional arrangements ("grandfathering") of previously approved packages. If enacted as proposed, the transitional arrangements will have detrimental effects on the NNPP activities related to design, analysis, certification, and operation of Type B radioactive material packages. These effects will challenge the NNPP mission to refuel and defuel U.S. Navy's nuclear powered warships. The basis of this conclusion and suggested alternatives are provided in Enclosure (1). If the NRC concludes that transitional arrangements should be enacted as proposed, NR requests a meeting with the NRC to discuss specific technical issues, safety margins, shipment practices, and administrative actions that would support the unhindered fabrication and operation of previously approved NNPP packages, all of which have sound safety records.

NR Action: NR forwards, for NRC consideration, comments on proposed revisions to 10CFR71 and RG 7.9. Please contact me at 202-781-6034 if you need any clarification

or additional information or, if necessary, to arrange a meeting to discuss application of the proposed transitional arrangements to the NNPP.

N. S. Plate
Naval Reactors

Enclosures: (1) COMMENTS ON PROPOSED REVISION TO 10CFR71
(2) COMMENTS ON PROPOSED REVISION TO RG 7.9

NTK: PRNR-GEN, RPAL-GEN

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None

ENCLOSURE (1)

COMMENTS ON PROPOSED REVISION TO 10CFR71, PACKAGING AND TRANSPORTATION OF RADIOACTIVE MATERIAL

Comments are formatted in the same order and manner as discussed in Federal Register, Volume 87, Number 175, dated September 12, 2022.

Issue 1: Revision of Fissile Exemptions.

No comments.

Issue 2: Revision of Reduced External Pressure Test for Normal Conditions of Transport.

No comments.

Issue 3: Inclusion of Type C Package Standards.

No comments.

Issue 4.1: Revision of Units for Insolation for Normal Conditions of Transport.

Naval Reactors suggests that the heading of column two of the insolation data in 10CFR71.71(c) should be corrected as follows to be consistent with IAEA regulation SSR-6.

~~“Total Insolation for a 12 hours period~~ **per day** (W/m²)”

Issue 4.2: Inclusion of Insolation for Hypothetical Accident Conditions.

No comments.

Issue 5: Inclusion of Definition for Radiation Level.

No comments.

Issue 6: Deletion of Low Specific Activity-III Leaching Test.

No comments.

Issue 7: Inclusion of New Definition for Surface Contaminated Object.

No comments.

Issue 8: Revision of Uranium Hexafluoride Package Requirements.

No comments.

Issue 9: Inclusion of Evaluation of Aging Mechanisms and a Maintenance Program.

No comments.

Issue 10: Revision of Transitional Arrangements.

NRC states: "The purpose [of revision to the transitional arrangements] is to minimize the costs and impacts of implementing changes in the regulations, since package designs and special form sources that are compliant with the existing regulations do not become unsafe when the regulations are revised (unless a significant safety issue is corrected in the regulation)" and "While the NRC has not identified safety issues that necessitate the discontinuation of these older packages, they are no longer acceptable in jurisdictions that use the IAEA requirements. The NRC views that the advantages of consistent approval across jurisdictions outweigh the value of retaining the authorization for these packages. The approach being taken is consistent with the NRC's 2004 rulemaking. Given this experience, the NRC does not expect that certificate holders will have challenges showing compliance with the regulations in effect at the time the application is submitted for revision."

Naval Reactors agrees that previously approved packages do not become unsafe when regulations are revised (unless a significant safety issue is corrected in the regulation), and in this case, the proposed revision to 10CFR71 does not identify or correct any regulatory safety issue. Naval Reactors does not agree that consistent approvals across jurisdictions and the associated placement of restrictions on previously approved packages outweighs the value of retaining package authorizations. Naval Reactors maintains the position that any restriction on the operation or fabrication of previously approved packages to 10CFR71 should be dictated by technical issues related to package safety, and not regulation changes for consistency and alignment with other (IAEA) regulations. Naval Reactors provided this position in the comment period for the 2004 revision of 10CFR71 [G#00-10954 dated September 28, 2000 & G#02-4000 dated July 26, 2002; letters are available in the NRC ADAMS database].

The primary basis of the proposed transitional arrangements is to align 10CFR71 to IAEA regulations to streamline package certification and approval between regulatory jurisdictions. Naval Reactors acknowledges this intent but believes this regulation

alignment is overly burdensome (based on the discussions below) for certificate holders that do not and will not transport NRC approved packages into IAEA jurisdictions. Specifically, NRC states that previously approved packages are safe, yet places the burden on certificate holders to require package certification upgrades in order to continue to operate or fabricate these packages (depending on certification designation), regardless of certificate holder intent to transport packages between NRC and IAEA jurisdictions. On this basis and to relieve this burden, Naval Reactors believes an exemption is warranted in the proposed transitional arrangements to not restrict previously approved NRC packages if they are only shipped in NRC jurisdictions. Prior to transitional arrangement phase-out and fabrication restriction dates, certificate holders could propose and the NRC could approve a shipment restriction in the associated package certificate of compliance to only authorize package shipments in NRC jurisdictions. The exemption could then require a certification upgrade prior to any application to transport into IAEA jurisdictions. Alternatively, NRC could place the shipment restriction directly in 10CFR71 as part of an exemption.

Naval Reactors plans to use previously approved packages without the “-85” or “-96” designations past the proposed eight year operational phase-out and plans to fabricate packages with the “-96” designation past the proposed fabrication phase-out by 2029. When considering the operational tempo of packages without the “-85” or “-96” designations, it is not practicable to phase-out these NNPP packages prior to the late-2030’s and meet the national security needs to refuel and defuel U.S. Navy nuclear powered warships. Naval Reactors is also actively developing new package designs and modifications in accordance with current 10CFR71 regulations. Any investment to upgrade package certifications will pull resources from these on-going efforts. Since previously approved packages have been concluded to be safe, no package modifications or changes to safety conclusions are expected during any certification upgrades. Therefore, Naval Reactors concludes that the transitional arrangements as proposed will force undue safety analysis report revisions that provide no safety improvement. In addition, the transitional arrangements as proposed will result in undue delay to the deployment of new or modified package designs in accordance with current 10CFR71 regulations.

Based on Naval Reactors experience after the 2004 revision to 10CFR71, significant investment is required in some cases to revise and certify revisions to safety analysis reports to upgrade packages for compliance with later revisions of 10CFR71 and associated NRC regulatory guidance. This is driven by numerous factors including, but not limited to: (1) inability to easily edit and revise documentation generated prior to wide-spread use of commercial electronic document software, (2) additional efforts to revise older safety analysis reports that are not formatted or structured to current regulatory guidance, and (3) changes over the decades to the overall and expected safety analysis methodologies, models, and assumptions that may force additional analysis efforts. While certification upgrades of newer packages will require less investment due to application of modern analysis and safety analysis report

documentation methods, significant investment is expected to upgrade certification of older packages (i.e., B(U) and B(U)F designations) since these safety analysis reports were originally generated several decades ago.

Naval Reactors does not agree with the NRC rationale and conclusion that 8 years is sufficient time to design, certify, and fabricate new packages, if certification upgrades of older packages are not possible or pursued. The NRC estimates 2 to 4 years for design and safety analysis report development, 1 to 2 years for certification review and approval, and 1 to 2 years for package fabrication. Based on recent experience with M-290 spent fuel package development, 4 years for package design and safety analysis report development is not justified, especially when scale drop tests are developed, executed, and results evaluated to inform design decisions and justify safety analysis report conclusions. In addition, 2 years for package fabrication is not justified when considering long lead-times for large and complex fabrication efforts (e.g., thick-walled spent fuel packages) and multiple packages are likely needed to be fabricated to replace existing package fleet capacity to meet shipment needs. For example, Naval Reactors is currently fabricating M-290 packages. It takes approximately 6 years to procure material and fabricate a single package, and approximately 8 years to complete fabrication of a sufficient number of packages to support a single NIMITZ Class aircraft carrier refueling. On the other hand for smaller and less complex fabrications, it is likely that a much larger number of packages would need to be fabricated and result in a similar lead-time. For example, several hundred new fuel packages would need to be fabricated to replace existing capacity. Naval Reactors concludes that at least a 16 year phase-out period is required to achieve the intent of the proposed phase-out period of older packages.

Naval Reactors does not agree with setting a fixed date of December 31, 2028 to prohibit fabrication of packages with the “-96” certification. While consistent with IAEA regulations, the date does not have a technical basis. Maintaining this date will force near-term emergent efforts to upgrade package certifications. In addition, there is uncertainty when the final 10CFR71 revision will be enacted which may lead to insufficient time to execute certification upgrades. If the package fabrication prohibition is maintained without any allowance for exemption, the prohibition date should be tied to date that the final 10CFR71 revision is enacted. At least 4 years should be maintained between the package fabrication prohibition date and issuance of the final 10CFR71 revision.

Naval Reactors prefers to not eliminate the administrative practice of stating the “-XX” year-based designation in the package identification number. Inclusion of the year-based designation provides a direct tie to the regulatory revision to which a package has been approved and thus aids in certification management.

Accordingly, based on the discussion above, Naval Reactors provides the following comments for NRC consideration:

1. The proposed transitional arrangements should be revised to not phase-out packages without “-85” or “-96” designations or restrict package fabrication with “-96” designation since this regulatory action is not related to package safety.
2. If the proposed transitional arrangements with package restrictions are enacted to maintain consistency with IAEA regulations, provide an exemption to phase-out and fabrication restrictions, if previously approved packages are only transported in NRC jurisdictions.
3. Extend the phase-out timing requirements for packages without “-85” or “-96” designations based on design, analysis, and fabrication timespans (i.e., at least 16 years) needed to replace existing capacity.
4. Revise the fabrication restriction of packages with “-96” designations to a time frame subject to the date that the 10CFR71 revision is enacted, in order to ensure sufficient time is available for certification upgrades (i.e., at least 4 years from enacting 10CFR71 revision).
5. Revise the transitional arrangements to maintain a year-based designation in package identification numbers for package approvals moving forward, rather than eliminating them.

Issue 11: Inclusion of Head Space for Liquid Expansion.

No comments.

Issue 12: Revision of Quality Assurance Program Biennial Report Requirements.

NRC proposes adding a biennial reporting requirement to notify NRC on changes to an approved quality assurance program, even if no changes are made. Provisions in 10CFR71.106 allow changes to approved quality assurance programs without NRC approval that do not reduce commitments, such as those that involve administrative improvements and clarifications, spelling corrections, and non-substantive changes. NRC states that the basis for this change is to ensure NRC has current information on each approved quality assurance program that are subject to periodic inspection every 5 years or on an as-needed basis.

Naval Reactors suggests adding this reporting requirement to the existing 5-year periodic certificate of compliance renewal process in accordance with 10CFR71.38, in lieu of creating an additional written notification requirement for the purpose of NRC administration. This would prevent the added burden to certificate holders to generate additional written notifications to the NRC, while ensuring NRC has current information. In addition, this would align with Regulatory Guide 7.9 to document the quality assurance program in the safety analysis report and provide notification of changes as part of 10CFR71.38 renewal process.

Issue 13: Deletion of Type A Package Limitations in Fissile Material General Licenses.

No comments.

Issue 14: Deletion of 233U Restrictions in Fissile General License.

No comments.

Issue 15.1: Deletion of Duplicative Reporting Requirements.

No comments.

Issue 15.2: Revision of the Definition of Low Specific Activity.

No comments.

Issue 15.3: Revision of Tables Containing A1 and A2 Values and Exempt Material Activity and Consignment Limits.

No comments.

Issue 15.4: Revision to Agreement State Compatibility Categories.

No comments.

Issue 15.5: Deletion of Redundant Advance Notification Requirements for Shipment of Spent Nuclear Fuel.

No comments.

Question 1: IAEA Changes in SSR-6 (2018 Edition) Not in the Scope of This Proposed Rule.

Naval Reactors did not identify any additional changes to 10CFR71 with respect to alignment to IAEA changes in SSR-6 (2018 Edition).

Question 2: Removing Tables A-1 Through A-4 in Appendix A to 10CFR71.

Naval Reactors sees no benefit to maintain duplicative Tables A-1 through A-4 in both 10CFR71 and 49CFR Chapter I.

Question 3: Merits of Requiring a Biennial Report for No Changes to a QAP.

Please see Naval Reactors comment on Issue 12.

ENCLOSURE (2)

COMMENTS ON PROPOSED REVISION 3 TO REGULATORY GUIDE 7.9, STANDARD FORMAT AND CONTENT OF PART 71 APPLICATIONS FOR APPROVAL OF PACKAGES FOR RADIOACTIVE MATERIAL

Section 6.1.2: Summary Table of Criticality Evaluation

The last part of this section states “The maximum value of the effective neutron multiplication factor (k_{eff}), the bias, the Monte Carlo and bias uncertainties, and the number of packages evaluated in the arrays should be specified in the table.”

The inclusion of “Monte Carlo” presupposes that Monte Carlo calculations are used in criticality safety analyses; however, other criticality computational methods could be used. Naval Reactors suggests replacing “Monte Carlo” with “computational”.

Section 6.9: Burnup Credit for Spent Nuclear Fuel

This section references section 6.4.7 of NUREG-2216 which is applicable to commercial spent nuclear fuel.

It is unclear if section 6.9 applies only to commercial spent nuclear fuel or other types of spent nuclear fuel. Naval Reactors suggests clarifying the scope and applicability of section 6.9 to commercial spent nuclear fuel. NRC should further coordinate the requirements of Section 6.9 with Naval Reactors if this section is intended to apply to naval spent nuclear fuel.

Section 7: Materials Evaluation

Sections 7.4, 7.5, and 7.6 are redundant with sections 3.2, 5.3.2, and 6.3.2, respectively.

Naval Reactors suggests removing these sections (similar to how sections 2.2 and 2.3 (in revision 2) were moved to Chapter 7) to avoid unnecessary duplication of material information in safety analysis reports.

Section 7.11.2 (last paragraph) states to describe how damaged fuel is transported to ensure that subcriticality is maintained.

Naval Reactors suggests removing this direction from the material evaluation section and move it into section 2 and/or section 6 since this direction relates to structural and criticality evaluations.

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Cc: [Bernie White](#); [James Firth](#)
Subject: [External_Sender] Naval Reactors Comments on Proposed Revision to 10CFR71 and RG 7.9 [NRC-2016-0179]
Date: Wednesday, November 23, 2022 11:50:57 AM
Attachments: [G#22-05444 \(Comments on NRC-2016-0179\).pdf](#)

The attached letter to this email contains Naval Reactors comments on the proposed revision to 10CFR71 and RG 7.9 [NRC-2016-0179]. The letter does not contain any controlled or classified information.

I am available to discuss or provide any clarifications as needed.

Have a happy and safe Thanksgiving!

V/r,
Nick Plate

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