



January 19, 2017
E-47399

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

Subject: Docket ID NRC-2016-0179, RIN 3150-AJ85
TN Americas LLC Responses to NRC-2016-0179-0004, titled Issues Paper on
Potential Revisions to Transportation Safety Requirements and Harmonization
with International Atomic Energy Agency Transportation

References: [1] Docket ID NRC-2016-0179, RIN 3150-AJ85
Revisions to Transportation Safety Requirements and Compatibility with
International Atomic Energy Agency Transportation Standards

[2] NRC-2016-0179-0004, Issues Paper on Potential Revisions to Transportation
Safety Requirements and Harmonization with International Atomic Energy
Agency Transportation

TN Americas LLC herein provides a response for each of the 14 issues discussed in Reference
2 above.

Should NRC staff have any questions, please contact Mr. Glenn Mathues by telephone at 410-
910-6538 or by e-mail at Glenn.Mathues@areva.com.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Don Shaw'.

Don Shaw
Licensing Manager
TN Americas LLC

cc: Peter Vescovi (TN Americas LLC)
Glenn Mathues (TN Americas LLC)

Enclosures:

1. TN Americas LLC Responses to NRC-2016-0179-0004

Enclosure 1 to E-47399

TN Americas LLC Responses to NRC-2016-0179-0004

Issue No. 1: Fissile Materials***Issue No. 1a: New Fissile Exceptions in IAEA SSR-6, Paragraph 417***

Paragraph 417(c) is intended to allow shipment of UF₆ samples based on historic practice. Note that consignment limits do not control the accumulation limits, and that accumulations exceeding a critical mass on a conveyance are a very low risk during the conduct of an international shipment from the U.S. to other countries. Such shipments, however, will need to consider the consignment limit. Any fissile exception mass limits should be the same as those limits specified in Paragraph 417 to avoid confusion for international shipments to other countries from the U.S. Not adopting the fissile exception limit in Paragraph 417(c) may increase the costs of shipping small quantities of uranium enriched in U-235 to a maximum of 5% by mass.

Shipments entering the U.S. from other countries will not be affected by the omission of a consignment limit. However, shippers need to be aware of consignment limits for international shipments. It should be noted that a 15 grams consignment limit was set in the International Atomic Energy Agency (IAEA) Regulations for fissile material in Paragraph 417(c), not for a technical or a safety reason, but for a practical reason (physical protection) (Reference SSG-26, Paragraph 517.2). The U.S. physical protection requirements in 10 CFR 73 have a similar 15-gram limit in the definition of special nuclear material (SNM) of low strategic significance (Section 73.2), and in-transit requirements that apply to SNM of low strategic significance (Section 73.67).

Issue No. 1b: Competent Authority-Approved Fissile Exception, SSR-6 Paragraph 417(f)

This provision is useful because of the variety of very low risk fissile materials that are produced when processing wastes. Experience has demonstrated that it is not possible to develop general specifications or requirements that can bound the diversity of low risk fissile materials.

The concentration limits in Section 71.15 (b),(c) are examples of specific exceptions allowed by the NRC as intended by Paragraph 417(f), but these concentration limits alone may not be general enough to provide for the diversity of materials generated from processing wastes. The increase in decommissioning activities and the disposition of legacy materials will continue to produce a variety of very low risk fissile material. Instead of relying on a rulemaking process to authorize additional fissile-exceptions, the concept of a process that allows approval of fissile exceptions using a review process similar to that used for the approval of packages and special form radioactive materials would be useful for licensees. The U.S. Department of Transportation (U.S. DOT) currently issues certificate of competent authority for special form radioactive materials in accordance with Paragraph 804 of the IAEA Regulations and Section 173.476 of Title 49 of the Code of Federal Regulations. A similar provision for approving approval of exemptions for fissile material beyond what is in Section 71.15 for domestic shipment would be of value to licensees.

Issue No. 1c: CSI-Controlled Fissile Material Packages, SSR-6 Paragraph 674

The limits in Sections 71.22 and 71.23 are appropriate as supported by assessments provided in NUREG/CR-5342. Likewise, the provisions in SSR-6 Paragraph 674 are supported by technical reasons to ensure the safety equivalent to that required for fissile material packages approved by competent authorities. The impact on international shipping of small quantities of fissile material using packaging that is not approved by a competent authority as allowed in Paragraph 674 depends on the interpretation of the U.S. DOT, under which international shipments, both into and from the U.S., are authorized under the international standards or regulations.

In the Rulemaking of HM-215M, (published January 8, 2015) U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA), incorporated by reference the 2012 IAEA SSR-6 regulations to replace the TS-R-1 (ST-1, Revised) 1996 Edition to allow shipments to be offered for transportation or transported under the most recent IAEA regulations. PHMSA added additional requirements to Section 171.23 to ensure domestic concerns were addressed. Paragraph (b)(11) of Section 171.23 prescribes these additional requirements for shipments of radioactive materials made under authorized international standards or regulations. PHMSA amended Section 171.23 to require that shipments of excepted fissile materials offered in accordance with the IAEA SSR-6 regulations also conform to the requirements of Section 173.453. However, the additional requirements added to Section 171.23 do not explicitly address packages containing fissile material that are authorized by the 2012 IAEA SSR-6 regulations in Paragraph 674.

The existing mass limits for the fissile material general licenses in Sections 71.22 and 71.23 are greater than the mass limits in Paragraph 674. However, the differences in allowed packaging types impose requirements on consignors that may increase the cost for shipments of small quantities of fissile material into the U.S. from other countries. Furthermore, consignors must also be a U.S. Nuclear Regulatory Commission (NRC) licensee in order to use the general licenses for transport into or within the U.S. Foreign consignors are not usually U.S. NRC licensees and they are not granted a general license.

It is not clear whether shipment of packages containing fissile material offered for shipment into or from the U.S. with contents as authorized by 2012 IAEA SSR-6 Paragraph 674 is allowed by Section 171.23 (b)(11). The NRC should either endorse the DOT's incorporation by reference of Paragraph 674 in Section 171.23, or incorporate the provisions of Paragraphs 674 and 570 in 10 CFR Part 71. This will benefit international shipments by allowing the import and export of small quantities of fissile material in packaging not approved for fissile material and using the criticality safety index (CSI) to control accumulation.

Issue No. 1d: Plutonium Shipments in Type A Packages, SSR-6 Paragraph 675

There is no existing or anticipated use of this exemption for the commercial fuel cycle transportation activities.

Issue No. 2: Consideration for Adopting a Change to the Reduced External Pressure

Design Requirement for Transportation Packages

The proposed change to Section 71.71(c)(3) to reduce the external pressure from “25 kPa (3.5 lbf/in²) absolute” to 60 kPa (8.7 psia) has no adverse impact on existing Safety Analysis Reports. This change provides increased design margins for packaging compared to using 3.5 psia value for external pressure.

Additional Comments on Fissile Material Exemptions

Section 71.15 (b) is a fissile exemption based on concentration of fissile material. The basis for this limit is supported by assessments provided in NUREG/CR-5342. The technical basis for the 15 grams fissile exemption limit assumes that the 1 gram of fissile is mixed within at least 200 grams non-fissile material. The presentation during the NRC Public Meeting on December 5, 2016, stated on that the non-fissile material does not include the packaging. Language should be added in Section 71.15 (b) to clarify whether the packaging material may be included in the non-fissile material.

Issue No. 3: Type C Package

There is no existing or anticipated use of Type C package for the commercial fuel cycle transportation activities.

Issue No. 4: Solar Insolation

Packages used for commercial fuel cycle transportation activities are typically involved in international shipments requiring multilateral approvals. Solar insolation is included in the thermal evaluations for existing package designs to meet the requirements for use in other countries. The NRC should add solar insolation as an initial condition to the fire test in Section 71.73(c)(4).

Changing the units in Section 71.71(c)(1) without due consideration to maintaining the same equivalent values could be burdensome to the certificate of compliance (CoC) holder. Keeping of the values, thus increasing the solar heat load by approximately 3% may seem insignificant. However, the increase could result in decreasing margins or exceeding thermal limits.

Additionally, NUREG 1536, Standard Review Plan for Spent Fuel Dry Storage Systems at a General License Facility, Revision 1, Section 4.5.3 refers to the use of the insolation values presented in 10 CFR Part 71 as acceptable for determining thermal loads and environmental conditions for 10 CFR Part 72 applications. Although the keeping of the same values increases the solar heat load by approximately 3% may not seem insignificant, this increase could have an impact to the thermal evaluations for Part 72 storage systems.

Issue No. 5: Replace Radiation Level with Dose Equivalent Rate.

Adding a definition of the term “radiation level” to Section 71.4 as defined in 49 CFR 173.403 would have less impact on existing licensee and regulatory documents. The term “radiation

level” in 49 CFR 173.403 includes “dose-equivalent rate” in the definition. A definition for the term “dose-equivalent rate” could also be added to both Section 71.4 and 49 CFR 173.403 without having to change the term “radiation level” throughout 10 CFR 71 and 49 CFR 173 to “dose-equivalent rate.”

Issue No. 6: Deletion of the Low Specific Activity-III Leaching Test

10 CFR Part 71 should be changed to remove the leaching test for LSA-III material as supported by the technical expert working group. The increase in decommissioning activities will generate increased volumes of consolidated wastes and activated metals that will be shipped to disposal sites as LSA-III. Elimination of any unnecessary tests to qualify waste materials will benefit the large volume of transport activities associated with planned nuclear power plant decommissioning activities.

Issue No. 7: Introduction of the Provisions for Large Solid Contaminated Objects (Surface Contaminated Object (SCO-III))

10 CFR Part 71 should be changed to add provisions for SCO-III. The increase in decommissioning activities will generate increased numbers of large radioactive objects. Provisions for SCO-III will benefit the large number of transport activities for large objects from planned nuclear power plant decommissioning activities.

Issue No. 8: UF₆ Packages

Existing packages for fissile material UF₆ may not have been tested or analyzed for drop tests in orientations that could potentially affect the plug. The plug component is not as susceptible to damage as the valve that extends from the surface of the 30B cylinder. Testing the package to demonstrate there is no contact with the valve can be extended to conclude that the same result can apply for the plug. In some cases, for multilateral approval, the regulators in other countries have required demonstration that the plug will not contact any other component of the packaging. Introducing this requirement would entail demonstration of the same performance criteria in order to maintain approval under the current regulations for packages approved under the 1996 edition of IAEA Regulations (-96). A change to 71.55(g)(1) to add the plug is not considered appropriate but, if made, should include a provision to allow continued use of packages approved prior to publishing a revision to include the plug.

Issue No. 9: Aging

This IAEA-proposed requirement to consider aging effects is appropriate for spent fuel storage casks and dry storage containers where the cask or container may remain in storage under 10 CFR 72 for decades with limited inspection during the storage period prior to transport under 10 CFR 71. The NRC division of Spent Fuel Management has drafted NUREG-XXXX (NRC ADAMS Accession Number ML16235A124), titled “Managing Aging Processes in Storage (MAPS),” which is currently scheduled to be issued for public comment in the Spring of 2017, and there is also NUREC 1927, “Standard Review Plan for Renewal of Specific Licenses and Certificates of Compliance for Dry Storage of Spent Nuclear Fuel,” Revision 1. The MAPS

Report provides a generic evaluation of the aging mechanisms that have the potential to challenge the ability of dry storage systems (DSS) SSCs to fulfill their important-to-safety functions. The MAPS Report also describes acceptable generic aging management programs (AMPs) that an applicant may use to maintain the approved design basis of its storage system. The Standard Review Plan (SRP) provides guidance for the review of general information, scoping evaluation information, and aging management information, included in a renewal application. The guidance provides information on review of time-limited aging analyses (TLAAs) and AMPs, including learning AMPs that consider and respond to operating experience. The guidance provides example AMPs for welded stainless steel canisters, reinforced concrete structures, and a high burnup fuel monitoring and assessment program. It also provides guidance on considerations for CoC renewals and the general license framework, including guidance on the implementation of AMPs by general licensees. For any proposal adding aging management considerations, 10 CFR Part 71 should give due consideration to 10 CFR Part 72 requirements that are evolving to monitor the effects of long-term interim storage.

Other packages used for commercial fuel cycle transport activities and used fuel transportation packages for dry storage canisters are not generally kept in long-term storage prior to transport. In the current NRC and DOT inspection requirements in S 71.87(b) and 49 CFR 173.475(b), licensees provide reasonable assurance that “the package is in unimpaired physical condition except for superficial defects such as marks or dents.” This determination should identify any degradation or aging effects on the packaging that would impair the intended function. Requirements included in Chapter 8, “Acceptance Test and Maintenance Program,” of 10 CFR Part 71 safety analysis reports specify tests and inspections for the continued use of the package, and specify a maintenance program that assures packaging performance during its service life. This is in following NUREG 1907, Standard Review Plan for Transportation Packages for Radioactive Material, and NUREG 1617, Standard Review Plan for Transportation Packages for Spent Nuclear Fuel.

The NRC proposal is appropriate to require aging management for packages that are to be used for transport after long-term storage. Imposing an aging management requirement on all transportation packages is not considered necessary, since there are already measures implemented through periodic maintenance and testing during the service life of the transportation package.

Issue No. 10: Transitional Arrangements

Limiting provisional use of packages to the last two major revisions (-85 and -96) is appropriate to recognize that the quality assurance programs prior to 1985 IAEA regulations were only established for the manufacturing of packaging. Recertifying packages approved under the 1973 edition of Safety Series No. 6 may require consideration of all aspects of using the package for transport, including testing, maintenance, inspections, and documentation for the packaging. Historically, the publication of revisions to make 10 CFR Part 71 compatible with the IAEA regulations has taken nearly 10 years for each new major edition of the IAEA regulations. The impact of this lag time has been to allow the use of packages in the U.S. that would otherwise be required to be re-certified or shipped via exemption for international transport into or through other countries. The NRC granting a time period after adoption of the final rule is

considered appropriate. A four-year period is appropriate to bring the package design and quality assurance for use of the package in compliance with the current requirements; however, designing, obtaining approval, and introducing the use of a replacement package design typically requires more than four years depending on the complexity of the package. A provision that would allow the NRC to review requests from the licensee to extend the period granted for phasing out packages would allow replacement of packages without impacting commercial commitments that may cover periods of greater than four years. Allowing requests to extend the use of expiring transportation packages, as was done in NRC RIS 2008-18 for packages approved under the 1967 edition of IAEA regulations, would be useful for licensees.

Issue No. 11: Adequate Space for Liquid Expansion Clarification

SSR-6 Paragraph 614 requires that materials of the packaging be physically compatible with the contents. One aspect of physical compatibility described in SSG-25 Paragraph 614.4 is sufficient ullage to avoid hydraulic failure. Adding a general packaging requirement to provide sufficient ullage is consistent with both DOT and IAEA regulations.

Issue No. 12: Quality Assurance Program Clarification

The language proposed for Section 71.106(b) is acceptable to clarify that a biennial report must be submitted to the NRC even if no changes are made to the quality assurance program during the reporting period.

Issue No. 13: Clarification of Type A Package Requirements in Section 71.22 – General License: Fissile Material, and Section 71.23 – General License: Plutonium-Beryllium Special Form Material

The concept of a general license for small quantities of fissile material in Sections 71.22 and 71.23 is similar to the new concept for fissile material packages introduced in the SSR6-6 2012 edition in Paragraph 674. SSG-26 Paragraph 674.1 notes the actual packaging (e.g., Type IP, Type A, Type B(U), Type B(M)) to be used is not specified, and these requirements need to be confirmed prior to shipment. The NRC should consider not specifying the actual packaging in Sections 71.22 and 71.23 and remove the requirement that the package contain no more than a Type A quantity of radioactive material (Sections 71.22 and 71.23 (c)(1)). The package requirement in Sections 71.22 and 71.23 (a) should be removed or replaced to require the use of packaging appropriate for the quantity and form of the radioactive material.

Issue No. 14: Clarification of U-233 Restriction in Section 71.22 – General License: Fissile Material

No comment.