NRC FORM 618
(8-2000)
10 CFR 71

U.S. NUCLEAR REGULATORY COMMISSION

CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES

1 a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
9196	32	71-9196	USA/9196/B(U)F-96	1 OF	4

2. PREAMBLE

a. This certificate is issued to certify that the package (packaging and contents) described in Item 5 below meets the applicable safety standards set forth in Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material."

b. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. THIS CERTIFICATE IS ISSUED ON THE BASIS OF A SAFETY ANALYSIS REPORT OF THE PACKAGE DESIGN OR APPLICATION

a. ISSUED TO *(Name and Address)*

TN Americas, LLC
7160 Riverwood Drive, Suite 200
Columbia, MD 21046

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION

TN Americas, LLC, application dated June 28, 2024.

4. CONDITIONS

This certificate is conditional upon fulfilling the requirements of 10 CFR Part 71, as applicable, and the conditions specified below.

5.

(a) Packaging

(1) Model No.: UX-30

(2) Description

Overpack for 30-inch uranium hexafluoride (UF_6) cylinders. The overpack is a right circular cylinder constructed of two stainless steel shells with the volume between the shells filled with 6-inch thick foam (7.8 - 9.8 PCF). A stepped and gasketed horizontal joint permits the top half of the overpack to be removed from the base. The package "halves" are secured with ten indexed, cross-locking "ball lock" pins. The overpack is 43.5" in diameter by 96" long. The maximum gross weight of the package is 8270 lbs.

Two types of 30 inch uranium hexafluoride cylinders may be carried in the UX-30 overpack. These are (1) an ANSI N14.1 Standard 30B cylinder, or (2) an ANSI N14.1 Standard 30C cylinder.

The ANSI N14.1 Standard 30C cylinder is essentially a 30B cylinder equipped with a Valve Protective Cover (VPC) that bolts over and protects the cylinder valve during transport. The VPC is a special design feature that provides additional assurance against the inleakage of water to the containment system and is an enclosure that retains any leakage.

(a) Packaging (continued)

(3) Drawings

The Model No. UX-30 packaging is fabricated in accordance with Orano TN Drawing No. C-110-B-57922-0001, sheets 1 through 3, Rev. 5, in submittal dated June 28, 2024.

(b) Contents

(1) Type and form of material

A. Unirradiated uranium, in the form of UF_6, with a U-235 mass percentage not to exceed 5 weight percent.

B. Reprocessed uranium, in the form of UF_6, with a U-235 mass percentage not to exceed 5 weight percent. The fission product gamma activity shall not exceed 4.4×10^5 MeV Bq/kgU. The alpha activity from neptunium and plutonium shall be less than 3.3×10^3 Bq/kgU.

(2) Maximum quantity of material per package

5,020 pounds UF_6 contained in an ANSI Standard N14.1 30B or 30C cylinder.
The maximum H/U atomic ratio for the UF_6 is 0.088.
The total activity in the package may not exceed 10^5 A_2.

(c) Criticality Safety Index (CSI)

Criticality safety index for the UX-30 overpack containing a standard ANSI N14.1 30B cylinder 5.0

Criticality safety index for the UX-30 overpack containing a standard ANSI N14.1 30C cylinder 0.0

Criticality safety index for the UX-30 overpack is not applicable to non-fissile or fissile-excepted contents.

6. When the optional 4 lid lifting clips are used instead of the top lugs, the top lid (cover) must be lifted with a spreader bar (saddle).

7. In addition to the requirements of Subpart G of 10 CFR Part 71:

   (a) Prior to each shipment, the weather/dust seal gasket between the upper and lower shells must be inspected and must be replaced if inspection shows excessive wear or any defects to the gasket.

   (b) Each packaging must meet the Acceptance Tests and Maintenance Program of Chapter 8 of the application.

   (c) The package shall be prepared for shipment and operated in accordance with the Operating Procedures of Chapter 7 of the application.

   (d) Prior to each shipment, the stainless steel components of the packaging, which include the ball-lock pins, must be visually inspected. Packagings in which stainless steel components show pitting, corrosion, cracking, or pinholes are not authorized for transport.

8. The 30-inch diameter UF_6 cylinder valve and plug threads may be tinned with ASTM B32, alloy 50A or Sn50 solder material, or a mixture of alloy 50A or Sn50 with alloy 40A or Sn40A material, provided the mixture has a minimum tin content of 45 percent.

9. Transport by air is not authorized.

10. Packagings must be marked with Package Identification Number USA/9196/B(U)F-96.

11. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.

12. Revision No. 30 of this certificate may be used until December 31, 2024. Revision 31 of this certificate may be used until July 31, 2025.

13. Expiration date: September 30, 2028.

REFERENCES

TN Americas, LLC Application dated: June 28, 2024.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

YOIRA DIAZ-SANABRIA

Digitally signed by YOIRA DIAZ-SANABRIA
Date: 2024.07.09 09:41:19 -04'00'

Yoira K. Diaz-Sanabria, Chief
Storage and Transportation Licensing Branch
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

Date: July 9, 2024

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

SAFETY EVALUATION REPORT

Docket No. 71-9196
Model No. UX-30
Certificate of Compliance No. 9196
Revision No. 32

SUMMARY

By application dated June 6, 2024 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML24157A369), as supplemented on June 13, 2024 (ML24164A287), and June 28, 2024 (ML 24180A061), TN Americas, LLC (TN or the applicant) requested an amendment to Certificate of Compliance (CoC) No. 9196, for the Model No. UX-30.

The applicant submitted consolidated Safety Analysis Reports (SARs) for the Model No. UX-30 package in support of the proposed amendment. These changes include authorized use of an additional material and updates and changes in how TN incorporates American Nationals Standards Institute (ANSI) N14.1, "American National Standard for Nuclear Materials- Uranium Hexafluoride - Packagings for Transport," ANSI N14.5 "American National Standard for Radioactive Materials - Leakage Tests on Packages for Shipment," and International Organization for Standardization (ISO) 7195, "Nuclear Energy — Packagings for the Transport of Uranium Hexafluoride (UF_6)," are referenced in the CoC. TN holds a quality assurance program, approved by the Commission, which satisfies the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 71, Subpart H, "Quality Assurance."

EVALUATION

The application included a request for consideration of NUREG-1886, "Joint Canada–United States Guide for Approval of Type B(U) and Fissile Material Transportation Packages." The Canadian endorsement for the UX-30 is CDN/E2150/-96, Rev 23.

Containment Evaluation

The staff reviewed the changes described in the SAR that are related to containment to verify that the UX-30 transportation package containment design is adequately described and evaluated under normal conditions of transport and hypothetical accident conditions, as required per 10 CFR Part 71.

The 30B and 30C cylinders that are specified by the ANSI N14.1, (used in the United States in association with 10 CFR Part 71), or ANSI N14.1 and ISO 7195, (used in association with the International Atomic Energy Agency (IAEA) Specific Safety Requirements No. SSR-6, "Regulations for the Safe Transport of Radioactive Material" and IAEA requirements) are the containment boundary and the 30B and 30C cylinders have been previously approved in the SAR. The ANSI N14.1 30B and 30C cylinders are shown in figures 1.2-2 and 1.2-3 of the SAR, respectively.

The SAR references for ANSI N14.1 and ISO 7195 in chapters 1, 2, 4, 7, and 8 have been added or updated to the years 2023 and 2020, respectively. The staff confirmed that both years are the latest issuance of each of the standards.

Section 2.3.1 of the SAR states that the 30B and 30C cylinders shall be fabricated as specified in ANSI N14.1-2023 or ANSI N14.1-2023 and ISO 7195-2020. Section 8.1 of the SAR further describes use of an earlier version in effect at the time of fabrication. The staff reviewed a summary of changes in ANSI N14.1-2023 as compared to ANSI N14.1-2012 and did not find the changes to be significant. For the 30B and 30C cylinders that will be fabricated, the staff finds it to be acceptable to fabricate to ANSI N14.1-2023. Existing cylinders must have been manufactured in compliance with an earlier version of this standard in effect at the time of fabrication. Similarly, section 2.3.2 of the SAR states that the 30B and 30C cylinders shall have acceptance tests in accordance with ANSI N14.1-2023 or ANSI N14.1-2023 and ISO 7195-2020, or an earlier version of each standard at the time of examination. For the 30B and 30C cylinders that will be examined, the staff finds it acceptable to perform acceptance tests to ANSI N14.1-2023. The staff did not review any changes for ISO 7195-2020 as compared to ISO 7195-2005 and cannot determine the acceptability of that reference. Further, ISO 7195-2020 is not used in association with 10 CFR Part 71 for domestic shipment.

ANSI N14.1-2023 section 5.1 continues to describe that cylinder designs shall be in accordance with Section VIII, Division I of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (B&PVC) (or “the Code”). ANSI N14.1-2023 section 5.2.1 describes that pressure vessels shall be fabricated in accordance with the Code, and pertinent to this SAR, the 30B and 30C cylinders shall be stamped with the official Code Symbol shown in the Code and be National Board registered, as specified in table 2 of ANSI N14.1-2023. Code stamp (ASME-U) is required for the 30B and 30C cylinders. The inclusion of these statements in ANSI N14.1-2023, which is referenced in chapters 7 and 8 of the SAR and included in the CoC allows for the portion of CoC Condition No. 6 associated with the ASME Code and Code stamping to be removed.

Section 4.1 of the SAR states that the fill valve and drain plug closure devices shall be installed using 200 to 400 ft-lbs of torque, the valve shall have 7 – 12 threads engaged, and the plug shall have 5 – 8 threads engaged. The staff verified these values are within the table 7 installation torques and insertions of the valve and hex head plugs of both ANSI N14.1-2023 and ISO 7195-2020. Additional information on the valve and hex head plug installation torques and insertions can be found in sections 7.2 and 7.2.1 of ANSI N14.1-2023.

Regulatory Guide 7.4, “Leakage Tests on Packages for Shipment of Radioactive Material,” endorses ANSI N14.5-2014. There are no significant changes between the ANSI N14.5-2014 and ANSI N14.5-2022 standards. The staff confirmed that 2022 is the latest issuance of the standard. The staff finds it to be acceptable for the applicant to add or update the ANSI N14.5 standard reference in chapters 4, 7, and 8 of the SAR to the latest issuance, ANSI N14.5-2022.

Based on review of the statements and representations in the application, the NRC staff concludes that the package has been adequately described and evaluated to demonstrate that it satisfies the containment requirements of 10 CFR Part 71.

Materials Evaluation

The staff reviewed the material properties for the alternate materials added to the UX-30 transportation package to determine whether the package is adequately described and

evaluated under normal conditions of transport and hypothetical accident conditions, as required per 10 CFR Part 71. The applicant revised UX-30 license Drawing C-110-B-57922-0001 to allow the use of ASTM International (ASTM) A479 Type 304 stainless steel for the shear lug. The applicant included an additional note to the drawing stating that ASTM A479 material may be used when ASTM A240 is specified. Consistent with the changes to the drawing, the applicant updated UX-30 SAR Table 2.2-1 to include the ASTM Type 479 specification. The applicant's evaluation of the package performance included in UX-30 SAR Chapter 2 uses the yield and tensile strength values listed in UX-30 SAR Table 2.2-1.

The staff reviewed the two ASTM specifications cited by the applicant, ASTM A240, "Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications," and ASTM A479, "Standard Specification for Stainless Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels." The staff also reviewed the changes proposed by the applicant in UX-30 license Drawing No. C-110-B-57922-0001 Revision 5 and SAR Table 2.2-1. The staff determined that the changes by the applicant were acceptable because the yield and tensile material properties, which are included in the revised UX-30 FSAR Table 2.2-1, are identical for ASTM A479 and ASTM A240 Type 304 stainless steel.

Based on review of the package, the NRC staff concludes that the applicant has adequately described the materials used in the transportation package in sufficient detail to demonstrate that it has met the requirements of 10 CFR 71.33. The applicant has also identified the applicable codes and standards for the design, fabrication, testing, and maintenance of the package and, in the absence of codes and standards, has adequately described controls for material qualification and fabrication such that the NRC staff concludes that it satisfies the requirements of 10 CFR 71.31(c). Finally, the NRC staff concludes that the applicant demonstrated effective materials performance of packaging components under normal conditions of transport and hypothetical accident conditions such that the requirements of 10 CFR 71.43(f) and 10 CFR 71.51(a) are satisfied.

Operating Procedures, Acceptance Tests and Maintenance Program

The staff reviewed the applicant's incorporation of updated ANSI N14.1, N14.5 and ISO 7195 standards. The leakage rate tests described in SAR sections 8.1 (for the ANSI N14.5 fabrication leakage rate test that occurs prior to the first use of each packaging) and 8.2 (for the maintenance leakage rate test that occurs after maintenance, and the periodic leakage rate test that must occur within 12 months prior to each shipment) for the 30B and 30C cylinders is the A.5.4, "Evacuated Envelope," of ANSI N14.5-2022 to the ANSI N14.5 leaktight, 1×10^{-7} ref-cm^3/s of air, acceptance criterion with a detector sensitivity of less than or equal to 5×10^{-8} ref-cm^3/s of air. The ANSI N14.5 pre-shipment leakage rate test is described in section 7.1.2 of the SAR that demonstrates no detectible leakage when tested to a sensitivity of 1×10^{-3} ref-cm^3/s based on dry air at standard conditions. The staff finds the fabrication, maintenance, periodic, and pre-shipment leakage rate testing to be acceptable.

Chapter 8 of the SAR includes statements that ANSI N14.1 (used in the United States in association with 10 CFR Part 71), ISO 7195 (used in association with IAEA SSR-6 and IAEA requirements), and ANSI N14.5, as cited in section 8.4 of the SAR, shall include earlier versions in effect at the time of: design, fabrication, operations, tests, or inspections as applicable throughout the acceptance tests in section 8.1 of the SAR (e.g., using the revision of the standard available at the time of fabrication), or tests or inspections as applicable throughout the maintenance program in section 8.2 of the SAR (i.e., using the latest revision of the standard as

described in section 8.4 of the SAR). Because ANSI N14.1 is referenced in chapter 8 of the SAR, which is specifically referenced in the CoC along with chapter 7 of the SAR, the staff concludes the associated portions of the CoC condition Nos. 6 and 7 can be removed. However, the staff did not review any changes for ISO 7195-2020 as compared to ISO 7195-2005 and cannot determine the acceptability of that reference. Further, ISO 7195-2020 is not used in association with 10 CFR Part 71.

The application had sufficient clarification to allow removal of Conditions No. 6 and No. 7 of the previous CoC regarding the ANSI N14.1 2012 edition. The SAR refers to the 2023 edition of ANSI N14.1 and the 2020 edition of ISO 7195. The 30B and 30C cylinders acceptance tests are in accordance with the ANSI N14.1, 2023 edition, or ANSI N14.1, 2023 edition and ISO 7195, 2020 edition (or earlier versions in effect at the time of fabrication) as described in chapter 8 of the SAR.

The submittal included no changes to the safety bases for the NRC approval. The staff reviewed the consolidated SAR against the guidance in NUREG-1886 and finds that the highlighted areas of emphasis have been appropriately addressed. The staff finds the ability of the package to meet the requirements of 10 CFR Part 71 is not affected.

CONDITIONS

The following changes have been made to the Certificate of Compliance:

Item No. 3.b. was revised to indicate the new identification of the applicant and consolidated SAR.

Condition No. 5 (3) was changed to indicate the new identification of the applicant and new drawing revision number.

Conditions No. 6 and 7 were deleted. The references to ANSI N14.1 (2023 edition) and ISO 7195 (2020 edition) are in chapters of the application referenced in the certificate and as such, references to ANSI N14.1 and ISO 7195 were removed from Condition No. 6 and 7. The requirement to fabricate in accordance with the ASME Code was removed since the ASME Code stamping requirement for the 30B Cylinder is included in the 2023 ANSI N14.1 standard.

Condition Nos. 8–15 were renumbered.

Renumbered Condition No. 12 was updated to authorize use of Revision No. 31 of the certificate until July 31, 2025.

The references were updated to reflect the June 28, 2024, consolidated application.

CONCLUSION

The staff finds the ability of the package to meet the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) CFR Part 71 is not affected.

Issued with Certificate of Compliance No. 9196, Revision No. 32.