



U.S. Department
of Transportation

Pipeline and
Hazardous Materials
Safety Administration

East Building, PHH-23
1200 New Jersey Ave, SE
Washington, D.C. 20590

**COMPETENT AUTHORITY CERTIFICATION FOR A
TYPE FISSILE
RADIOACTIVE MATERIALS PACKAGE DESIGN
CERTIFICATE USA/0829/AF, REVISION 2**

**REVALIDATION OF FRENCH COMPETENT AUTHORITY
CERTIFICATE F/420/AF**

The Competent Authority of the United States certifies that the radioactive material package design described in this certificate satisfies the regulatory requirements for a Type AF package as prescribed in the regulations of the International Atomic Energy Agency¹ and the United States of America². The package design is approved for use within the United States for import and export shipments made in accordance with applicable international and domestic transport regulations.

1. Package Identification - DN30.
2. Package Description and Authorized Radioactive Contents - as described in French Certificate of Competent Authority F/420/AF, Revision Be (attached). Contents are restricted to natural uranium, enriched commercial grade uranium, or slightly contaminated uranium with trace quantities limits, as specified in the French certificate.
3. Criticality - The minimum criticality safety index is 0.0. The maximum number of packages per conveyance is determined in accordance with Table 11 of the IAEA regulations cited in this certificate.
4. General Conditions -
 - a. Each user of this certificate must have in his possession a copy of this certificate and all documents necessary to properly prepare the package for transportation. The user shall prepare the package for shipment in accordance with the documentation and applicable regulations.

¹ "Regulations for the Safe Transport of Radioactive Material, 2012 Edition, No. SSR-6" published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

² Title 49, Code of Federal Regulations, Parts 100-199, United States of America.

CERTIFICATE USA/0829/AF, REVISION 2

- b. Each user of this certificate, other than the original petitioner, shall register his identity in writing to the Office of Engineering and Research, (PHH-23), Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Washington D.C. 20590-0001.
- c. This certificate does not relieve any consignor or carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.
- d. Records of Management System activities required by Paragraph 306 of the IAEA regulations¹ shall be maintained and made available to the authorized officials for at least three years after the last shipment authorized by this certificate. Consignors in the United States exporting shipments under this certificate shall satisfy the applicable requirements of Subpart H of 10 CFR 71.

5. Special Conditions -

- a. Cylinders used under this certificate must have been designed and manufactured in compliance with the ANSI N14.1 standard in effect at the time of manufacture.
- b. Cylinders used under this certificate must be operated, maintained and handled in accordance with the ANSI N14.1 standard in effect at the time of shipment.
- c. Contents that do not satisfy the definition of fissile material or that satisfy one of the fissile exceptions found in the IAEA regulations cited by this certificate may be transported as RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE non-fissile or fissile-excepted (UN 2978) under the provisions of this certificate. A criticality safety index is not applicable for these shipments and a separate H(U) or H(M) certificate is not required.
- d. Contents specified in Attachment 5 (Annex 5 in French language certificate) are not authorized by this certificate.

6. Marking and Labeling - The package shall bear the marking USA/0829/AF in addition to other required markings and labeling.

7. Expiration Date - This certificate expires on July 4, 2026. Previous editions which have not reached their expiration date may continue to be used.

CERTIFICATE USA/0829/AF, REVISION 2

This certificate is issued in accordance with paragraph(s) 816 of the IAEA Regulations and Section 173.472 and 173.473 of Title 49 of the Code of Federal Regulations, in response to the October 24, 2024 petition by Orano NCS, Montigny-Le-Bretonneux, France and in consideration of other information on file in this Office.

Certified By:



February 14, 2025

(DATE)

 William Schoonover
Associate Administrator for Hazardous
Materials Safety

Revision 2 - Issued to endorse French Certificate of Approval No. F/420/AF, Revision Be, for limited time while ageing management provisions are fully analyzed.



TRANSLATION

F/420/AF (Be)
page 1/22

CERTIFICATE OF APPROVAL FOR A PACKAGE DESIGN

The French competent authority,

Considering article R. 595-1 of the Environment Code;

Considering the application filed by Orano NCS GmbH company with its letter of 28 March 2024 referenced 0023-SVK-2024-013;

Considering the Orano NCS GmbH Safety Report of 18 March 2024 referenced 0023-BSH-2016-001-Rev10;

Considering the results of the public consultation from 19 June 2023 to 3 July 2023,

Certifies that the package design, described in Attachment 0, consisting of a DN30 overpack in which is placed a 30B cylinder loaded with uranium hexafluoride with a maximum enrichment of 5 % of Uranium 235:

- of commercial grade according to ASTM C996-10/15/20 Standard, or natural or depleted, as described in Attachment 1;
- reprocessed non-conforming to ASTM C996-10/15/20 Standard, with a restricted composition as described in Attachment 2;
- of commercial grade according to ASTM C996-10/15/20 Standard, for “heels” as described in Attachment 3;
- reprocessed non-conforming to ASTM C996-10/15/20 Standard, with a restricted composition for “heels” as described in Attachment 4;
- reprocessed according to ASTM C996-10/15/20 Standard, for “heels” with a long storage time as described in Attachment 5;

(Note: the content described in Attachment 5 is not part of the validation application)

complies, as a Type A package design loaded with fissile material, with the requirements of the following regulations and agreements:

- Regulations for the Safe Transport of Radioactive Material of the International Atomic Energy Agency, Safety Standards Requirements, No. SSR-6, 2018 issue;
- European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR);
- European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN);
- Regulations concerning the International Carriage of Dangerous Goods by Rail (RID);

TRANSLATION

- International Maritime Dangerous Goods (IMDG Code of OMI);
- Modified Decree of 23 November 1987 relating to the safety of ships, especially Division 411 of the adjoined rules (RSN Decree);
- Modified Decree of 29 May 2009 relating to land transports of dangerous goods (TMD Decree);

This certificate does not dispense the shipper of observing the rules established by the authorities of countries through or to which the package is transported.

This certificate may be the subject of an appeal before the competent court within two months of its signature.

This certificate is valid until 31 December 2028.

Registration No.: **CODEP-DTS-2024-030745**

Montrouge, 11 June 2024

**For the President of the Nuclear Safety Authority
and in Deputation
the Director of Transport and Sources,**

Fabien FÉRON

TRANSLATION

RECAPITULATION OF CERTIFICATE ISSUES

Issues	Expiration	Type of issue	Certificate rating	Revision index												
				body	t	0	1	2	3	4	5	6	7	8	9	10
26/12/18	26/12/23	New Approval	F/420/B(U)F	Aa	-	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
26/12/18	26/12/23	New Approval	F/420/AF	Aa	-	✓	✓	✓	✓	✓	-	-	-	-	-	-
26/12/18	26/12/23	New Approval	F/420/IF	Aa	-	✓	✓	✓	✓	-	-	-	-	-	-	-
04/11/19	26/12/23	Extension	F/420/AF	Ab	-	✓	✓	✓	✓	✓	-	-	-	-	-	-
04/11/19	26/12/23	Extension	F/420/IF	Ab	-	✓	✓	✓	✓	-	-	-	-	-	-	-
18/11/19	26/12/23	Extension	F/420/B(U)F	Ab	-	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-
15/04/22	26/12/23	Extension	F/420/AF	Ac	-	✓	✓	✓	✓	✓	✓	-	-	-	-	-
29/06/22	26/12/23	Extension	F/420/B(U)F	Ac	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
31/10/23	31/12/28	Renewal	F/420/AF	Bd	-	✓	✓	✓	✓	✓	✓	-	-	-	-	-
31/10/23	31/12/28	Renewal	F/420/B(U)F	Bd	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
31/10/23	31/12/28	Renewal	F/420/IF	Bd	-	✓	✓	✓	✓	-	-	-	-	-	-	-
07/06/24	31/12/28	Extensionl	F/420/AF	Be	-	✓	✓	✓	✓	✓	✓	-	-	-	-	-
07/06/24	31/12/28	Extension	F/420/B(U)F	Be	-	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
11/06/24	31/12/28	Extension	F/420/IF	Be	-	✓	✓	✓	✓	-	-	-	-	-	-	-

ATTACHMENT 0

DN30 OVERPACK AND 30B CYLINDER

1. DEFINITION OF THE PACKAGING

The packaging is designed, manufactured, inspected, tested, serviced and utilised according to the Orano NCS GmbH Safety Report 0023-BSH-2016-001-Rev10 of 18 March 2024.

The packaging, which has a general cylindrical shape, is shown in figs. 0.1 and 0.2.

The parts list of the packaging is given in 0023-STL-1000-000-Rev9.

The overall dimensions of the packaging are (for information):

- height: 1 329 mm;
- length: 2 437 mm;
- exterior diameter: 1 216 mm.

The maximum admissible mass of the packaging loaded for transport is 4 100 kg.

The packaging consists of the two following main subassemblies:

- 30B cylinder;
- DN30 overpack.

1.1 30B Cylinder

The 30B cylinder is a carbon steel cylindrical tank closed at each end by a domed head and defined by standards ISO 7195:2020 and ANSI N14.1-2019. The dimensions are:

- nominal length: 2 070 mm;
- nominal exterior diameter: 762 mm;
- nominal mass of the cylinder: 635 kg;
- minimum free volume of the cavity: 736 l;
- minimum thickness:
 - for contents in Attachments 1 and 2: 11 mm (except for small local abrasions);
 - for contents in Attachments 3, 4 and 5: 7.94 mm.

The cylinder has two openings:

- one valve screwed to one of the domed head, for filling and emptying;
- a plug screwed to the other domed head, for emptying.

A skirt forms an extension of the cylindrical part at each end, protecting valve and plug during operation activities.

The 30B cylinder is placed inside the DN30 overpack.

TRANSLATION

1.2 DN30 Overpack

The overpack is a cylinder consisting of two half overpacks. Each half overpack consists of an interior half shell and an exterior half shell, both made of stainless steel.

The interior half shell is covered by intumescent material.

The exterior shell has eighteen thermal plugs or valves (nine per half overpack).

The space between both shells is filled with rigid polyisocyanurate foam (PIR) and an insulating material.

The horizontal connection between both half overpacks is formed by an ethylene propylene diene monomer (EPDM) gasket.

The overpack stands on four feet.

1.3 Closure system of the DN30 overpack

The DN30 packaging is closed by means of six mortise-and-tenon (clamping) jaws. Each jaw consists of an upper and a lower part, each with four teeth with a central hole. The upper and lower parts are connected by a closing rod passed through the hole in the teeth and secured by a screw fitted with NORDLOCK washers.

1.4 Mechanical protection system

Damping of the DN30 packaging in case of drops or shocks is assured by the half shells and the foam between them.

1.5 Handling and stowage elements

Handling of the top half overpack is assured by means of two lifting lugs.

Handling of the packaging is assured by four lifting lugs fastened to the bottom half overpack. Forklift pockets on the bottom half overpack also allow handling the packaging with a forklift.

Holes in the feet of the packaging allow for stowage.

2. SAFETY FUNCTIONS

Containment is assured by the 30B cylinder, especially by its valve and its plug.

Radiation protection is assured by the 30B cylinder and the metallic elements of the DN30 packaging.

Criticality safety is assured by the confinement system described in Attachments 1 to 5 and in Chapter 2.2.5 of the Safety Report of the DN30 packaging.

Protection against shocks is assured by the shock absorbing materials of the packaging.

Protection against effects of a fire is assured by PIR foam, the insulating material, the intumescent material and the thermal plugs/valves.

3. **REQUIREMENTS FOR THE SHIPPER BEFORE SHIPMENT OF THE PACKAGE**

The packaging is used in compliance with handling instructions 0023-HA-2015-001-Rev11, 0023-PA-2015-015-Rev6 and 0023-PA-2015-017-Rev5.

For contents described in Attachments 1 and 2, a leakage test of the 30B cylinder is required before transport according to handling instructions 0023-HA-2015-001-Rev11. No leakage test before transport is required for contents of Attachments 3, 4 and 5.

For the content of Attachment 5, the completion of the control program specified in the ISO 7195:2020 standard is required before transport. This program appears in EDF note D459014 21-02096 Ind. 01.

To assess the maximum dose rate in contact with or near a DN30 packaging loaded with a filled cylinder, the measured gamma dose rate must be multiplied by 1.05 to account for the neutron dose rate when the latter is not directly measured.

In the case of an overpack loaded with a cylinder containing UF₆, the uranium of which comes from reprocessing, the dose rate measurements are carried out at least at the fourteen measurement points defined in the Safety Report. However, in the case of a "transport campaign", i.e. the transport of several cylinders filled with UF₆ whose uranium 232 concentration is identical, the measurement points can be limited to the five measurement points defined in the Safety Report if:

- measurements were taken at the fourteen measurement points on at least 30 overpacks loaded with a 30B cylinder;
- the results obtained show that it is possible to reduce the number of measurement points because the measurements obtained confirm the homogeneity, from the radiation protection point of view, of these overpacks loaded with 30B cylinders;
- the decision to reduce the number of measurement points is validated by the person responsible for radiation protection designated by the consignor.

In the case of a transport campaign for overpacks loaded with 30B cylinders containing heels from reprocessed UF₆ and for which the validity date of the periodic checks has passed, the consignor checks by sampling that the minimum thickness of the cylinders before transport is at least 7.94 mm. This sample check is carried out on at least thirty 30B cylinders visually showing the most extensive or significant corrosion.

4. **MAINTENANCE PROGRAM**

Maintenance of the packaging is carried out complying to the provisions of:

- Chapter 1.8 of the Safety Report,
- and the test instructions 0023-PA-2015-015-Rev6.

Maintenance of the 30B cylinder is carried out following the provisions of Standard ISO 7195:2020.

5. **NOTIFICATION**

Any decommissioning or change of owners of a packaging must be reported to the ASN with the following email address: dts-transport@asn.fr. To this end, an owner who sells a packaging transmits the name of the purchaser.

6. **QUALITY MANAGEMENT SYSTEM**

The principles of the management system which must be observed during the design, manufacturing, inspection, testing, maintenance, and utilisation of the packaging comply with those described in Chapter 1.9 of the Safety Report.

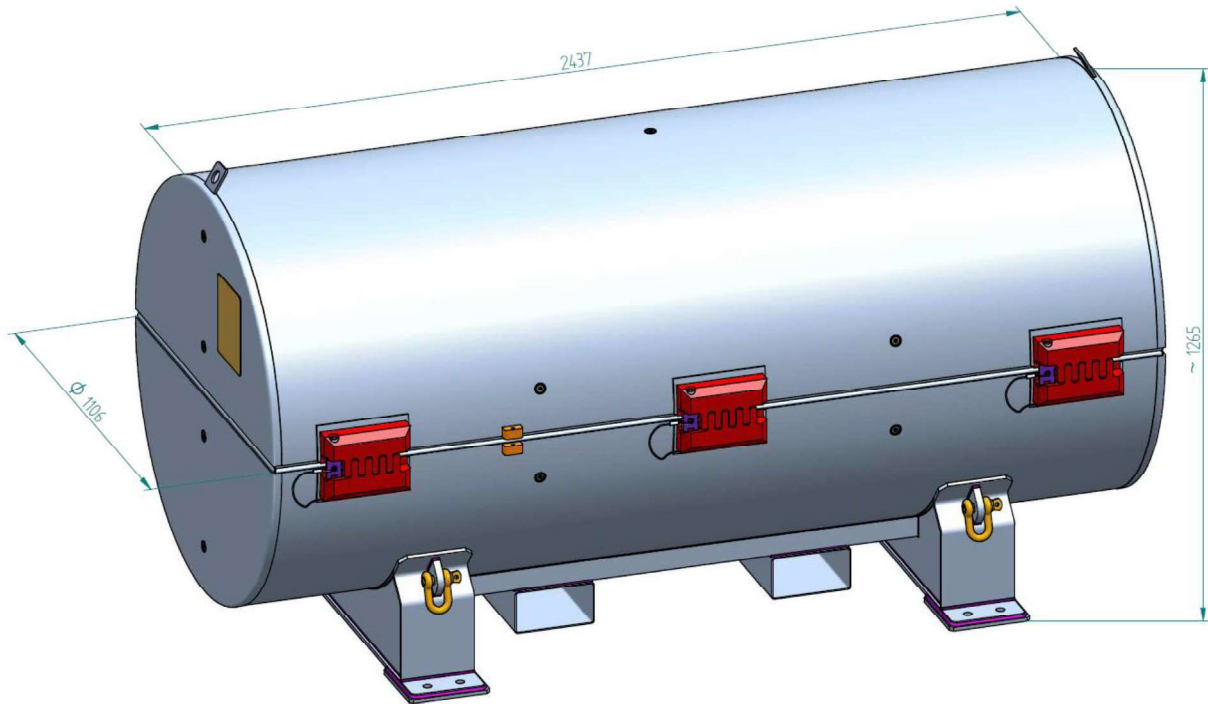
7. **COMPLEMENTARY PRESCRIPTION FOR RAIL TRANSPORTS**

For each rail transport, the train is driven by a motor vehicle.

The hump sorting of wagons, known as “TAB”, is therefore prohibited.

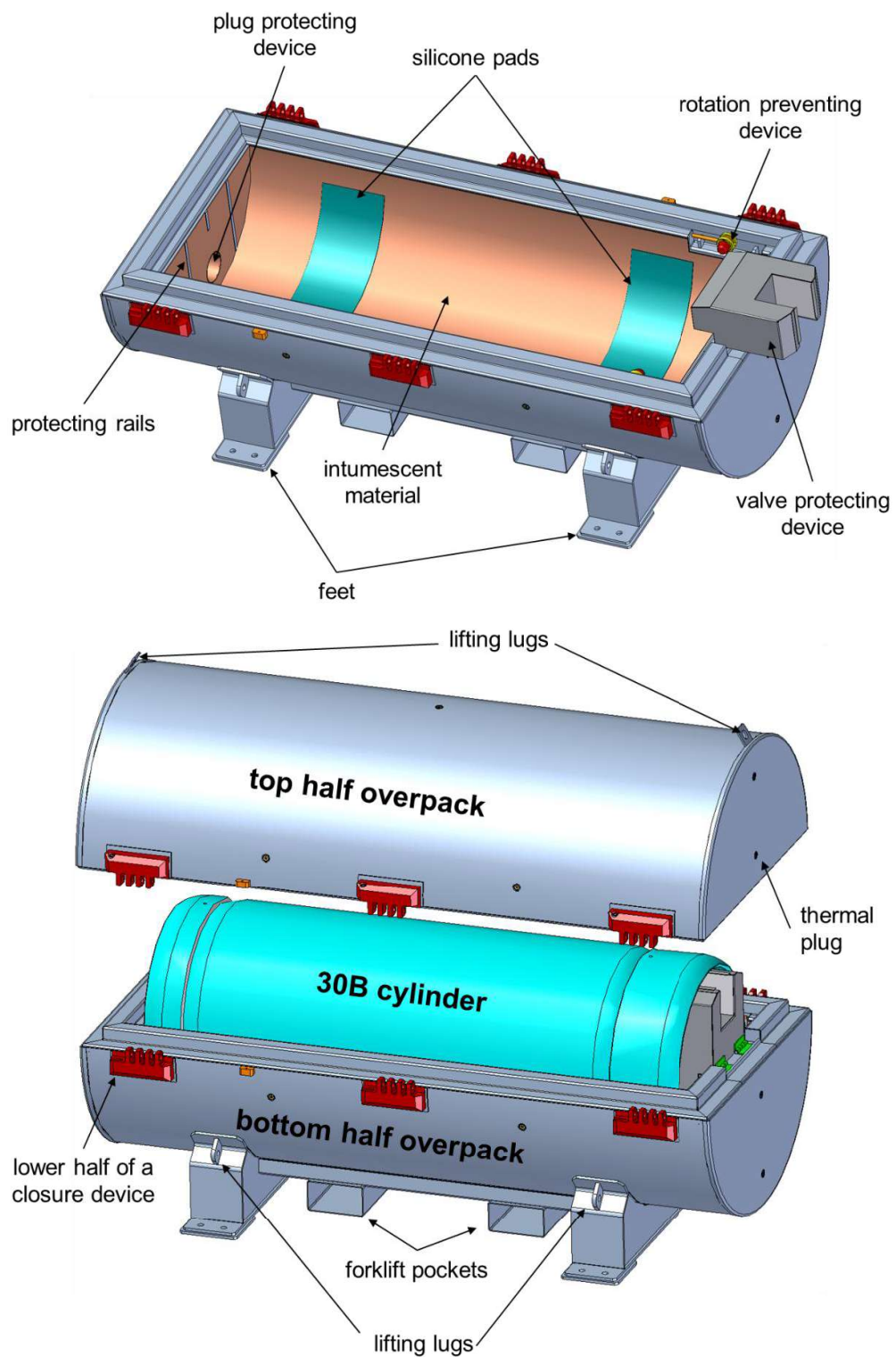
In addition, wagons must neither bump or be bumped by other wagons.

FIGURE 0.1
EXTERIOR VIEW OF THE DN30 OVERPACK



TRANSLATION

FIGURE 0.2
PICTURE OF THE DN30 BOTTOM HALF OVERPACK AND EXPLODED VIEW



ATTACHMENT 1

**COMMERCIAL GRADE URANIUM HEXAFLUORIDE ACCORDING TO STANDARD
ASTM C996-10/15/20 OR NATURAL OR DEPLETED URANIUM**

Orano NCS GmbH's Safety Report justifying this content is referenced 0023-BSH-2016-001-Rev10 from 18 March 2024.

1. DEFINITION OF THE AUTHORISED CONTENT

The authorised radioactive content is described in Attachment 1.3 of Safety Report 0023-BSH-2016-001-Rev10. It fulfils the following conditions:

- the content either complies with the definition of «**Enriched Commercial Grade UF₆**» of Standard ASTM C996-10/15/20, consists of natural uranium, or is depleted uranium;
- the permissible mass of UF₆ in a full 30B cylinder is between 11.3 kg and 2 277 kg;
- the ²³⁵U enrichment does not exceed 5 %;
- the activity of the content does not exceed 1 A₂;
- the minimum purity of the transported UF₆ is 99.5 % according to Standard ASTM C996-10/15/20;
- the heat generation rate of the content does not exceed 3 W.

The content of the 30B cylinder fulfils the following conditions:

Radionuclide	Maximum concentration (10 ⁴ µg/gU)
²³² U	1 x 10 ⁻⁸
²³⁴ U	5.5 x 10 ⁻²
²³⁵ U	5
²³⁶ U	2.5 x 10 ⁻²
²³⁸ U	100
⁹⁹ Tc	1 x 10 ⁻⁶

2. DEMONSTRATION OF CRITICALITY SAFETY

The demonstration of criticality safety is documented in Chapter 2.2.5 of Safety Report 0023-BSH-2016-001-Rev10.

TRANSLATION

The confinement system considered is:

- the fissile material (mass, purity, ^{235}U enrichment, chemical form),
- the 30B cylinder (dimension and thickness), with a wall thickness of at least 11 mm (except for small local abrasions),
- the DN30 overpack (dimension and materials).

The criticality safety index (CSI) is 0.

TRANSLATION

ATTACHMENT 2

REPROCESSED URANIUM HEXAFLUORIDE NON-CONFORMING WITH A RESTRICTED COMPOSITION

Orano NCS GmbH's Safety Report justifying this content is referenced 0023-BSH-2016-001-Rev10 from 18 March 2024.

1. DEFINITION OF THE AUTHORISED CONTENT

The authorised radioactive content is described in Attachment 1.3 of Safety Report 0023-BSH-2016-001-Rev10. It fulfils the following conditions:

- although it contains reprocessed uranium, the content is **not compliant** with the definition of «Reprocessed UF₆» of Standard ASTM C996-10/15/20; the uranium can also be depleted;
- the permissible mass of UF₆ in a full 30B cylinder is between 11.3 kg and 2 277 kg;
- the ²³⁵U enrichment does not exceed 5 %;
- the activity of the content does not exceed 1 A₂;
- the minimum purity of the transported UF₆ is 99.5 % according to Standard ASTM C996-10/15/20;
- the heat generation rate of the content does not exceed 3 W.

The content of the 30B cylinder fulfils the following conditions:

Radionuclide	Maximum concentration (10 ⁴ µg/gU)	Maximum gamma radiation (MeV·Bq/kg U)	Maximum alpha activity (Bq/kg U)
²³² U	6 x 10 ⁻⁸		
²³⁴ U	3 x 10 ⁻⁴		
²³⁵ U	5		
²³⁶ U	2.5 x 10 ⁻²		
²³⁸ U	100		
Fission products*		4.4 x 10 ⁵	
⁹⁹ Tc	5.0 x 10 ⁻⁴		
Neptunium and plutonium			3.3 x 10 ³
* Includes ⁶⁰ Co			

2. DEMONSTRATION OF CRITICALITY SAFETY

The demonstration of criticality safety is documented in Chapter 2.2.5 of Safety Report 0023-BSH-2016-001-Rev10.

The confinement system considered is:

- the fissile material (mass, purity, ^{235}U enrichment, chemical form),
- the 30B cylinder (dimension and thickness), with a wall thickness of at least 11 mm (except for small local abrasions),
- the DN30 overpack (dimension and materials).

The criticality safety index (CSI) is 0.

ATTACHMENT 3

**«HEELS» FROM COMMERCIAL GRADE URANIUM HEXAFLUORIDE COMPLYING WITH
STANDARD ASTM C996-10/15/20**

Orano NCS GmbH's Safety Report justifying this content is referenced 0023-BSH-2016-001-Rev10 from 18 March 2024.

1. DEFINITION OF THE AUTHORISED CONTENT

The authorised radioactive content is described in Attachment 1.3 of Safety Report 0023-BSH-2016-001-Rev10. It fulfils the following conditions:

- it consists of uranium that complies with the definition of «**Enriched Commercial Grade UF₆**» of Standard ASTM C996-10/15/20, of natural uranium, or depleted uranium;
- the permissible mass of UF₆ in the «heels», as defined in Standard ISO 7195:2020, does not exceed 11.3 kg;
- the ²³⁵U enrichment does not exceed 5 %;
- the activity of the content does not exceed 1 A₂;
- the minimum purity of the transported UF₆ is 99.5 % according to Standard ASTM C996-10/15/20;
- the heat generation rate of the content does not exceed 3 W.

The content of the 30B cylinder fulfils the following conditions:

Radionuclide	Maximum concentration (10 ⁴ µg/gU)
²³² U	1 x 10 ⁻⁸
²³⁴ U	5.5 x 10 ⁻²
²³⁵ U	5
²³⁶ U	2.5 x 10 ⁻²
²³⁸ U	100

Radionuclide	Maximal activity (Bq)
⁹⁹ Tc	1.08 x 10 ⁸

Daughter products of the radionuclides mentioned in the tables above can also be present in the content of the 30B cylinder.

2. DEMONSTRATION OF CRITICALITY SAFETY

The demonstration of criticality safety is documented in Chapter 2.2.5 of Safety Report 0023-BSH-2016-001-Rev10.

The confinement system considered is:

- the fissile material (mass, purity, ^{235}U enrichment, chemical form),
- the 30B cylinder (dimension and thickness),
- the DN30 overpack (dimension and materials).

The demonstration of criticality safety considers an unlimited quantity of water in the cylinder.

The criticality safety index (CSI) is 0.

ATTACHMENT 4

“HEELS” FROM REPROCESSED URANIUM HEXAFLUORIDE WITH A RESTRICTED COMPOSITION

Orano NCS GmbH's Safety Report justifying this content is referenced 0023-BSH-2016-001-Rev10 from 18 March 2024.

1. DEFINITION OF THE AUTHORISED CONTENT

The authorised radioactive content is described in Attachment 1.3 of Safety Report 0023-BSH-2016-001-Rev10. It fulfils the following conditions:

- it consists of uranium that is **not compliant** with the definition of «Reprocessed UF₆» of Standard ASTM C996-10/15/20; the uranium can also be depleted;
- the permissible mass of UF₆ in the «heels», as defined in Standard ISO 7195:2020, does not exceed 11.3 kg;
- the ²³⁵U enrichment does not exceed 5 %;
- the activity of the content does not exceed 1 A₂;
- the minimum purity of the transported UF₆ is 99.5 % according to Standard ASTM C996-10/15/20;
- the heat generation rate of the content does not exceed 3 W.

The content of the 30B cylinder fulfils the following conditions:

Radionuclide	Maximum concentration (10 ⁴ µg/gU)
²³² U	6 x 10 ⁻⁸
²³⁴ U	3 x 10 ⁻⁴
²³⁵ U	5
²³⁶ U	2.5 x 10 ⁻²
²³⁸ U	100

Radionuclide	Maximum gamma radiation (MeV·Bq)
Fission products	6.78 x 10 ⁸

Radionuclide	Maximal activity (Bq)
⁹⁹ Tc	4.87 x 10 ⁹

TRANSLATION

Radionuclides	Maximum alpha activity (Bq)
Neptunium and plutonium	5.08×10^6

Daughter products of the radionuclides mentioned in the tables above can also be present in the content of the 30B cylinder.

2. DEMONSTRATION OF CRITICALITY SAFETY

The demonstration of criticality safety is documented in Chapter 2.2.5 of Safety Report 0023-BSH-2016-001-Rev10.

The confinement system considered is:

- the fissile material (mass, purity, ^{235}U enrichment, chemical form),
- the 30B cylinder (dimension and thickness),
- the DN30 overpack (dimension and materials).

The demonstration of criticality safety considers an unlimited quantity of water in the cylinder.

The criticality safety index (CSI) is 0.

TRANSLATION

ATTACHMENT 5

No English translation, as it is not part of the validation request



U.S. Department of
Transportation

**Pipeline and
Hazardous Materials
Safety Administration**

East Building, PHH-23
1200 New Jersey Ave, SE
Washington, D.C. 20590

CERTIFICATE NUMBER: USA/0829/AF-96

ORIGINAL REGISTRANT(S) :

Orano TLI
8161 Maple Lawn Boulevard
Suite 480
Fulton, MD, 20759
USA

Westinghouse
Westinghouse Electric Company - Nuclear Fuel
Columbia Fuel Fabrication Facility
5801 Bluff Road
Hopkins, SC, 29061
USA

Orano NCS GmbH
Margarete-von-Wrangell-Straße 7
Hanau, Hesse, 63457
Germany

Louisiana Energy Services / Urenco USA
P.O. Box 1789

Eunice, NM, 88231
USA