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

U.S. Department of Transportation

Pipeline and Hazardous Materials Safety Administration

COMPETENT AUTHORITY CERTIFICATION FOR A TYPE B(U) RADIOACTIVE MATERIALS PACKAGE DESIGN CERTIFICATE USA/6613/B(U), REVISION 25

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 B(U) package as prescribed in the regulations of the International Atomic Energy Agency[1] and the United States of America[2] 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 - Model 702.

2. Package Description and Authorized Radioactive Contents - as described in U.S. Nuclear Regulatory Commission Certificate of Compliance No. 6613, Revision 22 (attached).

3. 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.

   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.

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[1] "Regulations for the Safe Transport of Radioactive Material, 2018 Edition, No. SSR-6, Revision 1" published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

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

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 regulations[1] 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.

4. Special Conditions -

a. Aging Management protocols detailed in QSA Global In-Service Bulletin SB-24 dated December 2024 (attached) shall be followed.

5. Marking and Labeling - The package shall bear the marking USA/6613/B(U) in addition to other required markings and labeling.

6. Expiration Date - This certificate expires on February 29, 2028. Previous editions which have not reached their expiration date may continue to be used.

This certificate is issued in accordance with paragraph(s) 810 of the IAEA Regulations and Section 173.471 of Title 49 of the Code of Federal Regulations, in response to the July 30, 2025 petition by QSA Global, Inc., Burlington, MA, and in consideration of other information on file in this Office.

Certified By:

William Quade
Acting Associate Administrator for
Hazardous Materials Safety

August 27, 2025
(DATE)

Revision 25 - Issued to endorse U.S. Nuclear Regulatory Commission Certificate of Compliance No. 6613, Revision 22, to the Regulations for the Safe Transport of Radioactive Material, 2018 Edition, No. SSR-6, Rev. 1.

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
6613	22	71-6613	USA/6613/B(U)-96	1	OF	3

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)*

QSA Global Inc.
40 North Avenue
Burlington, MA 01803

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION

QSA Global Inc., application dated December 4, 2017.

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.: 702

(2) Description

The Model No. 702 is composed of a stainless steel cylinder shield cask assembly secured to a rectangular carbon steel skid and further covered by a carbon steel cage assembly that is bolted to the skid at each corner. The overall dimensions of the Model No. 702 are 19 ¾" x 21" x 19" (502 mm x 533 x 483 mm) and the maximum weight is 410 pounds (186 kg) including contents. The shield cask assembly contains a depleted uranium shield and a cover assembly sealed by a neoprene gasket. The cover assembly flange is anchored to the cask with six bolts.

There is no locking assembly on the Model No. 702. Sources are secured in the shielded position by the cover assembly and two of the six securing bolts of the cover assembly are seal-wired with a tamper indicator seal. Metallic canisters and inserts used for holding special form sources are limited to non-pyrophoric metals with a melting temperature at or above 800ºC.

(3) Drawings

The Model No. 702 and other system components are constructed in accordance with QSA Global Drawing No. R70290, sheets 1 to 9, Revision AA.

5.(b) Contents

(1) Type and form of material

Iridium-192, Selenium-75, Cesium-137, and Ytterbium-169 as special form sealed sources.

(2) Maximum quantity of material per package:

Isotopes	Content Activity
Cs-137	500 Ci (18.5 TBq)
Se-75	10,000 Ci (370 TBq)
Yb-169	10,000 Ci (370 TBq)
Ir-192	15,000 Ci (555 TBq)

Isotope	Output Activity
Ir-192	6,500 Ci (240.5 TBq)**

**Ir-192 sources measured in Output Activity are cylindrical with steel encapsulations. Source configuration dimensions at the time of output activity determination are not to exceed:

3mm diameter (Ir-192)
4mm height (Ir-192)
1.675mm encapsulation wall thickness

OR

2.7mm diameter (Ir-192)
5.25mm height (Ir-192)
1.825mm encapsulation wall thickness

Additional encapsulations may be added so long as the output activity determination was made on an inner source configuration meeting the dimensions above. Additional encapsulation metallic inserts/spacers may be added that exceed the encapsulation thicknesses above as long as the total dimensions (Ir-192 material in source + encapsulation) do not exceed that of the above specified sources (i.e., the Ir-192 source dimensions are decreased by the amount the encapsulation is increased). Additional metallic encapsulation in excess of the maximum dimensions stated above need not be steel as long as density is equal to or less than that of Ir-192.

Output curies are determined by measuring the source output at 1 meter from the device and expressing its activity in curies. (Procedures reference: American National Standards Institute N432-1980, “Radiological Safety for the Design and Construction of Apparatus for Gamma Radiography.”)

CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE		PAGES
6613	22	71-6613	USA/6613/B(U)-96	3	OF	3

5.(b) Contents (continued)

(3) Maximum decay heat per package: 92 watts

(4) Maximum weight of contents: 0.88 pounds (400 grams)

6. The name plate must be fabricated of material capable of resisting the fire test of (10 CFR) Part 71 and maintaining their legibility.

7. In addition to the requirements of Subpart G of Title 10 of the *Code of Federal Regulations*, 10 CFR Part 71:

(a) Each package shall be operated and prepared for shipment in accordance with Chapter 7 of the application, as supplemented.

(b) The package must meet the Acceptance Tests and Maintenance Program of Chapter 8 of the application, as supplemented.

8. Revision No. 20 and Revision No. 21 of this certificate may be used until February 28, 2023.

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

10. Expiration Date: February 29, 2028.

REFERENCES

QSA Global Inc., application dated December 4, 2017, as supplemented on August 8, 2018, May 23, 2022, and June 22, 2022

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Yoira K. Diaz Sanabria Signed by Diaz-Sanabria, Yoira
on 10/31/22

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

Date: See digital signature

QSA GLOBAL.
SERVICE BULLETIN.

Purpose

This document provides information applicable to the inspection and maintenance of the Model 702 transport package to comply with IAEA SSR-6 (2018). In addition to ensuring the package is in accordance with the operating instructions supplied with the transport package, per 10 CFR 71.87 and 71.89, specifically Sections 7 & 8 of the Model 702 Safety Analysis Report, compliance with this bulletin is required for all packages shipped under a USDOT certificate, or other foreign Type B certification, endorsed to IAEA SSR-6 (2018).

Package Inspection & Maintenance Requirements

The Model 702 packages must be maintained regularly by trained and qualified personnel to ensure the package complies with applicable Type B(U) or Type A approval requirements and the package maintains its integrity during transport.

The recommended inspection and maintenance requirements are based on the system's design, application, materials, anticipated work cycles, environmental factors of use under the normal and abnormal conditions of transport. A program of systematic maintenance will prolong the working life of the package in addition to ensuring safety during transport and use. Routine inspection of the package is required prior to each shipment. In addition, a complete annual servicing of the 702 package is necessary to ensure the package integrity.

Maintenance program administrators must recognize the need for maintenance intervals that are less than the required annual interval, especially in cases where the package is used in severe environmental conditions. Maintenance program administrators must ensure the systems are completely serviced immediately after observed damage or after exposure to severe conditions. Extreme or severe conditions may include, but is not limited to, conditions where the package was:

- Immersed in water or mud.
- Subjected to high-concentrations of particulate such as fly ash, sand or foundry green-sand.
- Subjected to salt-water conditions, caustic or acidic materials.
- Subjected to accidental drops or falling objects.
- Whenever subjected to extreme environmental conditions.

The complete, annual inspection and maintenance (also required after removal from long term storage – see Section 5) involves an enhanced inspection and service for package components and major assemblies.

Personnel performing the inspections and maintenance in this bulletin must be adequately trained and approved to perform these duties. Personnel approved and qualified under either a USNRC approved QA program or an ISO 9001 QA program to perform Type B container inspection and maintenance would meet the training requirements in this bulletin.

1. General Requirements

a. The Model 702 transport packages must be loaded and closed in accordance with procedures that, at a minimum, include the requirements in Sections 7 & 8 of the SAR and this bulletin. Shipment of Type B quantities of radioactive material are authorized for sources specified in Section 2. Maintenance and inspection of these packages is in accordance with the additional requirements specified in Section 3 through 5.

NOTE: Package conformance after storage and prior to use for Type B shipments is ensured by proper inspection and maintenance. The materials used in the Model 702 packages are not vulnerable to degradation due to irradiation over time, and there will typically be no chemical/galvanic material interactions between package materials during storage so long that the package is not exposed to hazardous chemicals and is stored under controlled environmental conditions[1].

For packages removed from storage and prior to shipment, the package components are inspected for any degradation due to non-use/storage. Any degradation identified will prevent the package use for shipment until correction by replacement, service and/or repair. (Reference: IAEA SSR-6 §503(e) & 613A).

b. Results of package annual inspections and maintenance covered in this bulletin must be recorded and include, at a minimum,

- The date of inspection and maintenance.
- Name and signature of the qualified individual performing the required inspections.
- Problems found and maintenance or repairs performed.
- Package model number (e.g., 702) and the serial number on the cage nameplate.
- Serial numbers for the package major sub-assemblies including:
  - The inner shield cask (the serial number will appear both on the base and the cover)
  - The cage (the cage serial number will appear on the inside surface of one of the bottom square tubes and will be different from the 702 package assembly on the cage nameplate)
  - The 702 package skid assembly (the serial number is located on the top surface of the skid to the right of one of the 1" x 1" outer welded pads)
- Associated equipment that was inspected and maintained.
- Part numbers and associated lot numbers or serial numbers of replacement parts installed.

If any defective/damaged components are identified on the package or source(s) contained in the 702, they must be removed from transport use and identified with a status indicator (tag, label, or tape) to prevent inadvertent shipment or use. Defective or damaged components must be repaired or replaced before continued use of the Model 702 package (or source assembly as applicable) in transport.

NOTE: Service/repair of any 702 sub-assembly must be performed by, or under the direction and approval of, QSA Global, Inc. only.

Contact QSA Global, Inc. if additional guidance or assistance is needed to determine actions to deal with defective/damaged equipment.

2. Authorized Package Contents

The Model 702 transport package is designed for use with a special form source capsules as approved under a U.S. Department of Transportation special form certification[2]. The approved isotopes and maximum package activity limits are shown in Table A. Details of encapsulation as well as chemical and physical form of the radioactive material will comply with specifications approved under U.S. Department of Transportation or other Competent Authority special form certifications.

[1] Storage of the Model 702 packages should be in a temperature and humidity controlled area away from chemicals or other hazardous substances to prevent degradation of the package integrity while in storage.
[2] Special Form is defined in 10 CFR 71, 49 CFR 173, IAEA TS-R-1 and SSR-6.

Table A: Isotopes Permitted in the Model 702

Isotope[3]	Activity Type[4]	Maximum Activity	Capsule Form[2]
Ir-192	Content	15,000 Ci	Special Form
Ir-192	Output	6,500 Ci[5]	Special Form[6]
Cs-137	Content	500 Ci	Special Form
Se-75	Content	10,000 Ci	Special Form
Yb-169	Content	10,000 Ci	Special Form

3. Packaging Maintenance and Inspection Prior to Shipment

a. If the package has been in storage for 1 year or longer, inspection to the requirements in Section 4 must be completed in addition to the maintenance and inspection listed in this section.

b. Ensure all markings are legible including component serial numbers and the labels are securely attached to the package. Labels should be easily legible at a distance of roughly 3 ft (1 m) and contain all necessary information.

c. Inspect the container sub-assemblies for signs of damage or significant degradation. Ensure all welds are intact, the components are free of heavy rust and cracks/damage to the cask components, hold down assembly, steel cage and skid. If there is any evidence of damage which could adversely impact the component's ability to perform its function on the package, contact QSA Global, Inc. prior to shipping.

d. Inspect the cask lid gasket to ensure it is intact, undegraded and adhered to the top surface of the cask base. **Note: The cask lid gasket is replaced prior to each empty or loaded shipment of the package from QSA Global, Inc.**

e. Assure all bolts, washers, nuts and fasteners (hardware) and hold down components required for assembly of the package, and as specified on the drawings referenced on the Type B transport certificate, are fit for use. Examine the visible external surfaces for any signs of damage including fatigue cracking.

Note: The hardware must be replaced if they are no longer fit for use (e.g., threads stripped, unable to fully thread, signs of cracking, etc.). If replacement hardware is required, contact QSA Global, Inc. to obtain parts. This is necessary to ensure replacement hardware meets all applicable specifications listed on the drawings referenced on the Type B transport certificate.

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[3] The Model 702 contains 225 lbs (102 kg) depleted uranium shielding equivalent to 36.6 mCi of U-238.

[4] 6,500 Ci of Ir-192, determined as output curies, is equivalent to 15,000 Ci of Ir-192 content activity. The maximum content activity for Ir-192 is divided by a factor of 2.3 to account for source capsule and self-absorption when converting content activity to its equivalent output activity in this conversion.

[5] Output activity determined by measuring the source output at 1 meter from the device and expressing its activity in Curies. (Procedures ref: ANSI N432-1980, "Radiological Safety for the Design and Construction of Apparatus for Gamma Radiography".

[6] Ir-192 sources measured in output activity are cylindrical with steel encapsulations. Source configuration dimensions at the time of output activity determination not to exceed either 3 mm diameter x 4 mm high with 1.675 mm wall thickness, or 2.7 mm diameter x 5.25 mm high with 1.825 mm wall thickness. Additional encapsulations may be added so long as the output determination was made on an inner source configuration meeting one of these dimensions. Additional metallic encapsulation in excess of the maximum dimensions stated in this note need not be steel as long as density is equal to or less than that of Ir-192.

f. Ensure the cask lid can be fully assembled to the cask base and secured in place using the six 3/8-16 x 7/8 long bolts, flat washers and lockwashers including application of a torque of 236 ± 5 in-lb to all bolts. Ensure the package can be assembled, including application of hardware torque requirements and attachment of a seal wire as identified on drawing R70290 Revision AA.

g. If the container fails any of the inspections in steps 3.a-f, remove the container from use until it can be brought into compliance with the Type B certificate.

4. Packaging Annual Maintenance and Inspection

Model 702 packages must receive inspection and maintenance at least once a year. Annual maintenance and inspection is performed by QSA Global, Inc. (or its approved service centers). The annual inspection and maintenance must be performed by individuals specifically trained, qualified and authorized for this work.

To perform the annual maintenance/inspection, the package must be disassembled and the major package sub-assemblies thoroughly cleaned and inspected to ensure the integrity of components that are critical to safety. These procedures can only be performed on an empty package, which requires transfer of the radioactive source assembly(ies) into an approved storage container.

A leak test of a sealed source must be performed every 6 months or prior to its first use after removal from storage. Acceptable results of a radio-assay must indicate removable contamination is less than <185 Bq (0.005 µCi). If the source requires a leak test, perform the test and obtain the results prior to transferring the source from the package into a source changer.

a. If the package has been in storage for 1 year or longer, inspection to the requirements in Section 4 must be completed in addition to the maintenance and inspection listed in this section.

b. Ensure all markings are legible including component serial numbers and the labels are securely attached to the package. Labels should be easily legible at a distance of roughly 3 ft (1 m) and contain all necessary information.

c. Inspect the container sub-assemblies for signs of damage or significant degradation. Ensure all welds are intact, the components are free of heavy rust and cracks/damage to the cask components, hold down assembly, steel cage and skid. Thoroughly inspect all components for rough edges, wear points, burrs, etc. which could cause jamming or irregular assembly. If there is any evidence of damage which could adversely impact the component's ability to perform its function on the package, contact QSA Global, Inc. prior to shipping.

d. Inspect the cask lid gasket to ensure it is intact and undegraded. **Note: The cask lid gasket is replaced prior to each empty or loaded shipment of the package from QSA Global, Inc.**

e. Excluding nameplate hardware and the 13 ¾ long, ½-13 threaded rods, replace all other bolts, washers, nuts and other fasteners used to assemble the package with new, compliant components as specified on the drawings referenced on the Type B transport certificate.

f. Inspect the 13 ¾ long, ½-13 threaded rods to ensure they are still fit for use. Examine the visible external surfaces for any signs of damage including fatigue cracking.

Note: The threaded rods must be replaced if they are no longer fit for use (e.g., threads stripped, unable to fully thread, signs of cracking, etc.). If replacement is required, new, compliant components as specified on the drawings referenced on the Type B transport certificate.

g. Clean and inspect all threaded holes on the shield cask, cage assembly and skid assembly. Threaded holes must accommodate and engage the required size bolt and, when assembled with applicable nuts/washers, the torque requirements must be able to be achieved when secured into the threaded holes.

h. If the package meets the requirements of 4 b. through g., complete an annual inspection sticker and apply one to the shield cask lid, skid top surface and cage assembly on one of the inside surfaces.

i. Maintain records of this inspection and maintenance (see 1.b in this bulletin).

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/6613/B(U)-96

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