Canadian Certificate No.: **CDN/E238/-96 (Rev. 4)**

Issue Date: **Jul-07-2021**

Expiry Date: **May-31-2026**

CNSC File: **30-10-2-191**

Certificate

CDN/E238/-96 (Rev. 4)

Endorsement of Transport Package Design

No. USA/9357/B(U)-96 (Rev. 6)

The transport package design identified below is certified by the Canadian Nuclear Safety Commission pursuant to paragraph 21(1)(h) of the *Nuclear Safety and Control Act* and Subsection 10(1) of the *Packaging and Transport of Nuclear Substances Regulations*, 2015 and to the IAEA's *Regulations for the Safe Transport of Radioactive Material*, 2012 Edition.

REGISTRATION OF USE OF PACKAGES

All users of this authorization shall register their identity in writing with the Canadian Nuclear Safety Commission prior to the first use of this authorization and shall certify that they possess the instructions necessary for preparation of the package for shipment.

PACKAGE IDENTIFICATION

Designer:	**QSA Global Inc.**
Make/Model:	**Sentry 110, 330 and 867**
Mode of Transport:	**Air, Sea, Road, Rail**

IDENTIFICATION MARK

The package shall bear the competent authority identification mark **"USA/9357/B(U)-96".**

PACKAGE DESCRIPTION

The Sentry series transport package as further described in Foreign Certificate No. USA/9357/B(U)-96 (Rev. 6) is composed of the Sentry 110, Sentry 330 and Sentry 867 which consist of an outer cylindrical welded stainless steel shell encasing a depleted uranium shield with a titanium "S" tube. The space between the outer shell and the shield is filled with polyurethane foam. An optional assembly can be bolted to the outer shell for handling, lifting and securing of the package.

The outer shell has two welded port assemblies connected to the "S" tube on opposite sides of the cylindrical surface. A front plate assembly and a rear plate lock assembly are attached to these ports in the case of models 110 and 330. Two lock assemblies are attached to the ports in the case of the model 867.

The rear plate lock assembly contains the selector/lock assembly for securing and operating the source. The rear plate assembly for the models 110 and 330 devices prevents the source from exiting the package on that side and secures the source assembly for transport.

The lock assemblies for the model 867 allow for source removal and secure the source assembly using locking pins. The rear plate locks incorporate a protective dust cover with a lock that prevents rotation of the selector ring during transport. The "S" tube in the model 867 has a partition in the middle that prevents a source assembly from passing through the shield from one side to the other.

These transport packages can be transported in either the “Standard configuration” or the “Basic configuration”. The standard configuration includes the handling rib and link plates whereas the basic configuration does not include the handling ribs and plates.

Illustrations of the package are shown in attached Drawing No. R86000, (Rev. U), Sheet 2 of 11.

The configuration of the Sentry 110 is as follows:

Shape:	**Cube**	Shielding:	**Depleted Uranium**
Mass:	**274 kg**	Outer Casing:	**Stainless Steel**
Length:	**495 mm**	Height:	**495 mm**
Width:	**495 mm**	Diameter:	**n/a**

The configuration of the Sentry 330 and 867 is as follows:

Shape:	**Cube**	Shielding:	**Depleted Uranium**
Mass:	**354 kg**	Outer Casing:	**Stainless Steel**
Length:	**495 mm**	Height:	**495 mm**
Width:	**495 mm**	Diameter:	**n/a**

AUTHORIZED RADIOACTIVE CONTENTS

The Sentry series transport packages are authorized to contain the following contents as further described in Foreign Certificate No. USA/9357/B(U)-96, (Rev. 6).

The model Sentry 110 is authorized to contain:

a) a maximum of 4.07 TBq of Co-60 in QSA Global source model 60011 which meets the requirements for special form radioactive material and inserted in source assembly Model No. A424-14 or 943.

The Model Sentry 330 is authorized to contain either:

a) a maximum of 4.07 TBq of Co-60 in QSA Global source model 60011 which meets the requirements for special form radioactive material inserted in source assembly Model No. A424-14 or 943; or

b) a maximum of 8.14 TBq of Co-60 in QSA Global source model 60011 which meets the requirements for special form radioactive material inserted in source assembly Model No. A424-13; or

c) a maximum of 12.21 TBq of Co-60 in QSA Global source model 60012 which meets the requirements for special form radioactive material and inserted in source assembly Model No. A424-13.

The Model Sentry 867 is authorized to contain a maximum of 12.21 TBq of Co-60 in one or two source assemblies listed below:

a) QSA Global source model 60011 which meets the requirements for special form radioactive material and inserted in source assembly Model No. A424-13, A424-14, A424-15, A424-18 or 943; or

b) QSA Global source model 60012 which meets the requirements for special form radioactive material and inserted in source assembly Model No. A424-13.

MANAGEMENT SYSTEM

The management system for the design, manufacture, testing, documentation, use, maintenance and inspection of the package shall be in accordance with:

- Foreign Certificate No. USA/9357/B(U)-96 (Rev. 6)
- Packaging and Transport of Nuclear Substances Regulations, 2015

SHIPMENT

The preparation for shipment of the package shall be in accordance with:

- Foreign Certificate No. USA/9357/B(U)-96 (Rev. 6)
- Packaging and Transport of Nuclear Substances Regulations, 2015

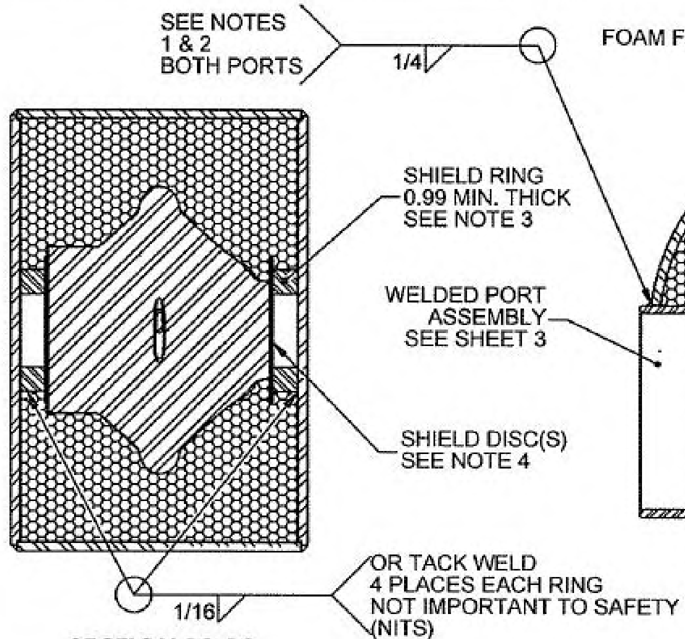
This certificate is valid only in Canada.

I. Tremblay
Designated Officer pursuant to paragraph 37(2)(a)
of the Nuclear Safety and Control Act

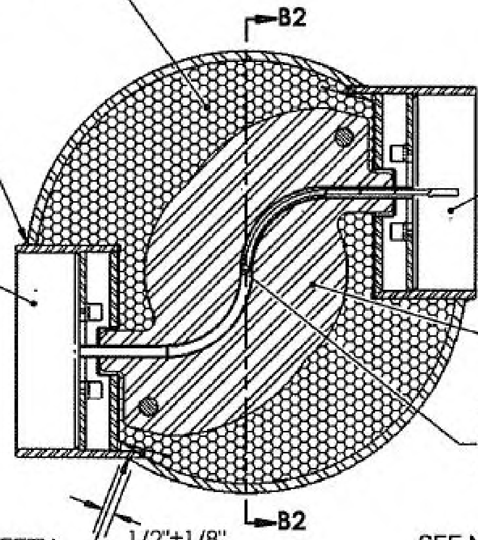
NOTES

Foreign Certificate No. USA/9357/B(U)-96 (Rev. 6) attached.

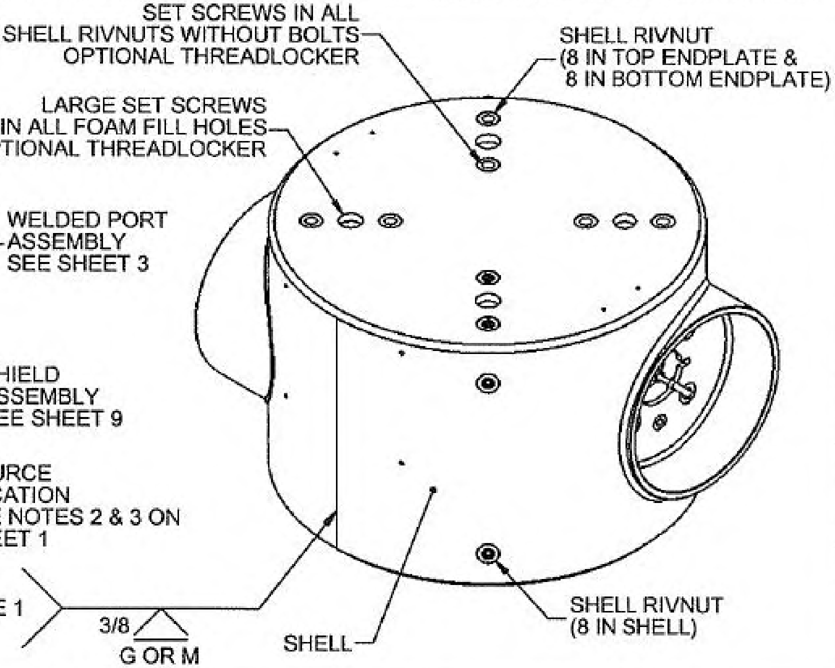
Revision 0: February 19, 2013. Original issue.
Revision 1: May 28, 2014. Certificate revised to incorporate Revision 2 of Foreign certificate.
Revision 2: July 18, 2016. Certificate issued to incorporate Revision 4 of Foreign certificate.
Revision 3: May 11, 2018. Certificate issued to incorporate Revision 5 of Foreign certificate.
Revision 4: July 7, 2021. Certificate issued to incorporate Revision 6 of Foreign certificate.

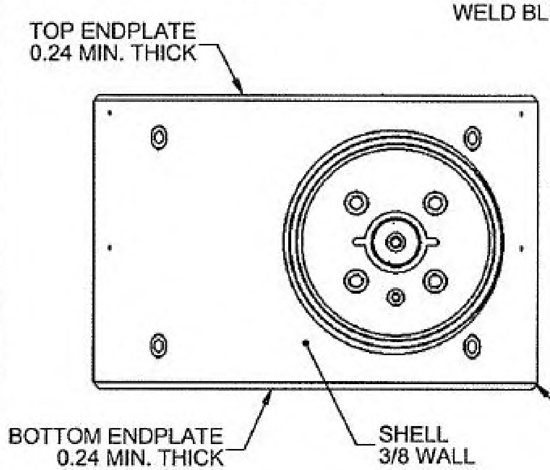


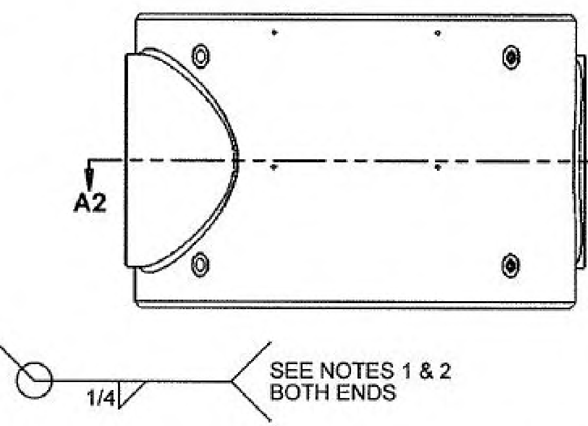
SECTION B2-B2



SECTION A2-A2







U LARGE SET SCREW	4	FIREPROOF STAINLESS STEEL
U SET SCREW	24	
SHIELD ASSEMBLY	REF	SEE SHEET9
WELDED PORT ASSEMBLY	REF	SEE SHEET 3
SHELL RIVNUT	24	NAS1330N8E-426 PER ASTM A276 OR A493
FOAM FILL	AR	POLYURETHANE, CLOSED CELL FOAM, 18 LBS PER CUBIC FOOT MINIMUM DENSITY
SHIELD RING	2	TYPE 304/304L STN STL PER ASTM A511 ANNEALED CONDITION. PASSIVATED.
SHIELD DISC	AR	TYPE C101 OR C110 COPPER PER ASTM B152
BOTTOM ENDPLATE	1	TYPE 304/304L STN STL PER ASTM A240, A276 OR A666 ANNEALED CONDITION. PASSIVATED OR ELECTROPOLISHED. SHELL ALSO OPTIONALLY PER ASTM A182
TOP ENDPLATE	1	
SHELL	1	
PART NAME	QTY	MATERIAL

NOTES:

1. ALL WELDS ARE EITHER GTAW OR GMAW AND ARE PERFORMED AND INSPECTED BY PERSONNEL QUALIFIED IN ACCORDANCE WITH AWS D1.6 STRUCTURAL WELDING CODE - STAINLESS STEEL OR CERTIFIED TO ASME BOILER AND PRESSURE VESSEL CODE SECTION VIII DIV1. LONGITUDINAL SEAM WELD MAY NOT BE PRESENT WHEN ASTM A182 MATERIAL IS USED.
2. ALL WELDS ARE VISUALLY INSPECTED BY INSPECTORS QUALIFIED TO ASNT SNT-TC-1A REQUIREMENTS.
3. SHIELD RING USED FOR SENTRY 110 (NOT SENTRY 330 OR MODEL 867).
4. COPPER DISC(S) OR SHEET USED AT ALL URANIUM/STEEL INTERFACES.

WELDED BODY ASSEMBLY

ALL TRANSPORT PACKAGE CONFIGURATIONS

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE INCHES & TOLERANCES ±1/16

QSA GLOBAL

40 NORTH AVE, BURLINGTON, MA 01803

DESCRIPTIVE DRAWING

TITLE **SENTRY TRANSPORT PACKAGE**

SIZE A | DWG. NO. R86000 | REV U

SCALE: NONE | SHEET 2 OF 11

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 B(U)
RADIOACTIVE MATERIALS PACKAGE DESIGN
CERTIFICATE USA/9357/B(U)-96, REVISION 6**

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 - Sentry - Model Nos. Sentry 110, Sentry 330, and Sentry 867.

2. Package Description and Authorized Radioactive Contents - as described in U.S. Nuclear Regulatory Commission Certificate of Compliance No. 9357, Revision 7 (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, 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.

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. Marking and Labeling - The package shall bear the marking USA/9357/B(U)-96 in addition to other required markings and labeling.

5. Expiration Date - This certificate expires on May 31, 2026. 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 May 19, 2021 petition by QSA Global, Inc., Burlington, MA, and in consideration of other information on file in this Office.

Certified By:

for William Schoonover
Associate Administrator for Hazardous
Materials Safety

May 27, 2021
(DATE)

Revision 6 - Issued to endorse U.S. Nuclear Regulatory Commission Certificate of Compliance No. 9357, Revision 7.

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
9357	7	71-9357	USA/9357/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 January 12, 2021.

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.: SENTRY

(2) Description

The Model No. SENTRY package includes the Model Nos. SENTRY 110, SENTRY 330, and SENTRY 867, as three variations of the same design. The external dimensions of all models in their standard transport configurations, i.e., with the handling rib and link plate assemblies, are identical and are approximately 1   inches (4   cm) wide, 19 inches (48 cm) tall, and 19 inches (48 cm) deep.

The primary components of the SENTRY packages include (i) a depleted uranium shield completely encased and supported in a cylindrically shaped, stainless steel, welded body, (ii) the rear plate lock and front plate assemblies, (iii) the handling rib and link plate, and (iv) the source assembly. The inner cavity of the welded body around the shield is filled with polyurethane foam. The Model Nos. SENTRY 110 and 330 packages can contain only one source wire assembly during transport, while two source wire assemblies can be loaded into the Model No. SENTRY 867 package. The radioactive contents are securely positioned by either a lock slide for the Model Nos. SENTRY 110 and 330 packages or locking pins for the Model No. SENTRY 867 package. All lock assemblies include a dust cover with a plunger lock to prevent rotation of the selector ring and further secure the source in the package during transport.

The optional rib/link assemblies provide lifting attachments and are bolted to the body weldment. The maximum weight, including the optional rib/link assemblies, is 780 pounds (354 kg) for the Model Nos. SENTRY 330 and 867 packages, and 605 pounds (274 kg) for the Model No. SENTRY 110 package.

5.(a) Packaging (continued)

(3) Drawings

The package is constructed in accordance with QSA Global, Inc., Drawing No. R86000, Rev. U, sheets 1-11.

(b) ontents

(1) Type and form of material

Cobalt-60, as a sealed source, which meets the requirements of special form radioactive material.

All source wire assemblies consist of a special form capsule crimped onto the end of a flexible steel wire.

(2) Maximum quantity of material per package:

Co-60: 110 curies (4.0 TBq) for the Model No. SENTRY 110 package.

Co-60: 330 curies (12.2 TBq) for the Model Nos. SENTRY 330 and 867 packages.

(3) Maximum weight of contents:

0.09 pounds (40 grams) for the Model Nos. SENTRY 110 and 330 packages.

0.18 pounds (80 grams) for the Model No. SENTRY 867 package.

The maximum content weight includes the mass of radioactive material and the source capsule handling wire assembly for a shipment containing the maximum number of source wire assemblies that can be transported in a package, i.e., 1 source wire assembly for the Model Nos. SENTRY 110 and 330 packages, and 2 source wire assemblies for the Model No. SENTRY 867 package.

(4) Maximum decay heat: 5.5 watts

6. A cover over the source wire connector prevents access to the source assembly until a keyed lock is actuated and the cover removed. This cover stays in place during transport of the package.

7. The nameplate shall maintain its legibility and be fabricated of materials capable of resisting the fire test of 10 CFR Part 71.

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

   (a) The package shall be prepared for shipment and operated in accordance with the Operating Procedures in Section 7 of the application;

   (b) The package must meet the Acceptance Tests and Maintenance Program of Section 8.0 of the application.

9. Supplemental shielding shall not exceed 5% of the maximum weight of the depleted uranium casting, with a thickness not to exceed 0.5 inch.

10. Revision No. 6 of this certificate may be used until May 31, 2022.

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

12. Expiration date: May 31, 2026.

REFERENCES

QSA Global Inc., application dated January 12, 2021.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

John B. McKirgan

Digitally signed by John B. McKirgan
Date: 2021.05.19 11:39:27 -04'00'

John McKirgan, Chief
Storage and Transportation Licensing Branch
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

Date: 05/17/2

Numéro du certificat canadien : **CDN/E238/-96 (Rév. 4)**

Date de délivrance : **juil.-7-2021**

Date d'expiration : **mai-31-2026**

Dossier de la CNSC : **30-10-2-191**

Certificat d'homologation

CDN/E238/-96 (Rév. 4)

Acceptation de la conception de colis de transport de l'étranger

n° USA/9357/B(U)-96 (Rév. 6)

La Commission canadienne de sûreté nucléaire a procédé à l'homologation du modèle de colis décrit plus loin en vertu de l'alinéa 21(1)(h) de la *Loi sur la sûreté et la réglementation nucléaires* et de l'article 10(1) du *Règlement sur l'emballage et le transport des substances nucléaires* (2015) du Canada et du Règlement de l'AIEA, Édition de 2012, *Règlement de transport des matières radioactives* de l'Agence internationale de l'énergie atomique.

INSCRIPTION DE L'USAGE DU COLIS

Toute personne qui prévoit utiliser la présente autorisation pour la première fois doit s'inscrire par écrit auprès de la Commission canadienne de sûreté nucléaire et attester qu'elle possède les instructions nécessaires pour préparer le colis pour fins d'expédition.

IDENTIFICATION DU COLIS

Concepteur :	**QSA Global Inc.**
Marque/Modèle :	**Sentry 110, 330 et 867**
Modes de transport :	**aérien, maritime, routier, ferroviaire**

MARQUE D'IDENTIFICATION

Le colis porte la marque d'identification **<<USA/9357/B(U)-96>>** de l'autorité compétente.

DESCRIPTION DU COLIS

La série (colis de transport) Sentry telle que décrite plus en détail dans le certificat de l'étranger nº USA/9357/B(U)-96 (Rév. 6), comprend les modèles Sentry 110, Sentry 330 et Sentry 867 et consiste en une enveloppe extérieure cylindrique en acier inoxydable soudé entourant un blindage fait d'uranium appauvri contenant un tube en « S » fait en titane. L'espace entre l'enveloppe externe et le blindage est rempli de mousse de polyuréthane. Un assemblage boulonné optionnel peut être installé sur le corps extérieur pour faciliter la manutention, le levage et l'arrimage du colis.

L'enveloppe externe comporte deux ensembles de ports soudés et connectés au tube en « S » sur les côtés opposés de la surface cylindrique. Un ensemble de plaque avant et de plaque arrière muni d'un mécanisme de verrouillage est attaché à ces ports dans le cas des modèles Sentry 110 et 330. Un mécanisme de verrouillage est attaché aux deux extrémités dans le cas du modèle Sentry 867.

Le mécanisme de verrouillage de l'ensemble de plaques arrière est muni d'un sélecteur / verrou afin de sécuriser ou permettre le mouvement de la source. L'ensemble de plaques arrière des modèles Sentry 110 et 330 prévient le retrait de la source de ce côté et permet d'assurer que l'assemblage de la source est maintenu en position blindé pour le transport.

Le mécanisme de verrouillage du modèle Sentry 867 permet le retrait de la source ainsi que son verrouillage par l'utilisation de goupilles de verrouillage. Le mécanisme de verrouillage arrière est protégé par un couvercle antipoussière munie d'une serrure qui empêche la rotation de la bague de commutation en cours de transport. Le tube en « S » du modèle Sentry 867 comporte une cloison en son centre empêchant l'assemblage de source de traverser vers le côté opposé.

Ces colis de transport peuvent être transportés selon la « configuration standard » ou la « configuration de base ». La configuration standard comprend des poignées de manutention et des plaques de liaison tandis que la configuration de base ne comprend pas ces poignées et ces plaques.

Des illustrations du colis sont présentées sur le dessin nº R86000, (Rév. U), feuille 2 de 11, ci-joint.

La configuration du Sentry 110 est la suivante :

Forme :	**Cube**	Blindage :	**Uranium Appauvri**
Masse :	**274 kg**	Enveloppe extérieure :	**Acier inoxydable**
Longueur :	**495 mm**	Hauteur :	**495 mm**
Largeur :	**495 mm**	Diamètre :	**n/a**

La configuration du Sentry 330 et 867 est la suivante :

Forme :	**Cube**	Blindage :	**Uranium Appauvri**
Masse :	**354 kg**	Enveloppe extérieure :	**Acier inoxydable**
Longueur :	**495 mm**	Hauteur :	**495 mm**
Largeur :	**495 mm**	Diamètre :	**n/a**

CONTENU RADIOACTIF AUTORISÉ

Les modèles de colis de transport de la série Sentry sont autorisés à contenir le contenu radioactif suivant tel que décrit plus en détail dans le Certificat de l'étranger nº USA/9357/B(U)-96, (Rév. 6).

Le modèle Sentry 110 est autorisé à contenir:

a) un maximum de 4,07 TBq de Co-60 dans le modèle de source de QSA Global QSA nº 60011, qui rencontre les exigences relatives aux matières radioactives sous forme spéciale, insérée dans l'assemblage de source de modèle nº A424-14 ou 943.

Le modèle Sentry 330 est autorisé à contenir soit:

a) un maximum de 4,07 TBq de Co-60 dans le modèle de source de QSA Global QSA nº 60011 qui rencontre les exigences relatives aux matières radioactives sous forme spéciale, insérée dans l'assemblage de source de modèle nº A424-14 ou 943; ou

b) un maximum de 8,14 TBq de Co-60 dans le modèle de source de QSA Global QSA nº 60011 qui rencontre les exigences relatives aux matières radioactives sous forme spéciale, insérée dans l'assemblage de source de modèle nº A424-13; ou

c) un maximum de 12,21 TBq de Co-60 dans le modèle de source de QSA Global QSA nº 60012 qui rencontre les exigences relatives aux matières radioactives sous forme spéciale, insérée dans l'assemblage de source de modèle nº A424-13.

Le modèle Sentry 867 est autorisé à contenir un maximum de 12,21 TBq de Co-60 dans un ou deux assemblages de sources énumérées ci-dessous:

a) le modèle de source de QSA Global nº 60011 qui rencontre les exigences relatives aux matières radioactives sous forme spéciale, insérée dans l'assemblage de source de modèle nº A424-13, A424-14, A424-15, A424-18 ou 943; ou

b) le modèle de source de QSA Global Source nº 60012 qui rencontre les exigences relatives aux matières radioactives sous forme spéciale, insérée dans l'assemblage de source de modèle nº A424-13.

SYSTÈME DE GESTION

Le système de gestion visant la conception, la fabrication, les épreuves, l'établissement des documents, l'utilisation, l'entretien et l'inspection du colis doit être conforme aux :

- Certificat de l'étranger nº USA/9357/B(U)-96 (Rév. 6)
- Règlement sur l'emballage et le transport des substances nucléaires (2015)

EXPÉDITION

La préparation du colis pour fins d'expédition doit être conforme aux :

- Certificat de l'étranger nº USA/9357/B(U)-96 (Rév. 6)
- Règlement sur l'emballage et le transport des substances nucléaires (2015)

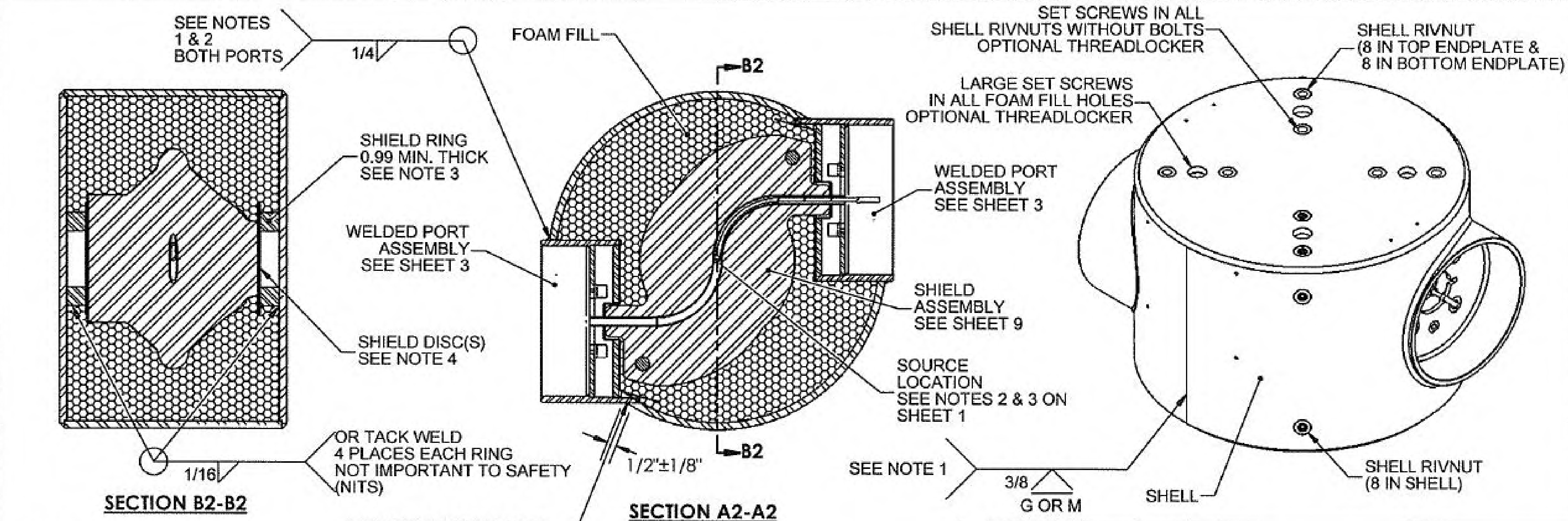
Le présent certificat n'est valide qu'au Canada.

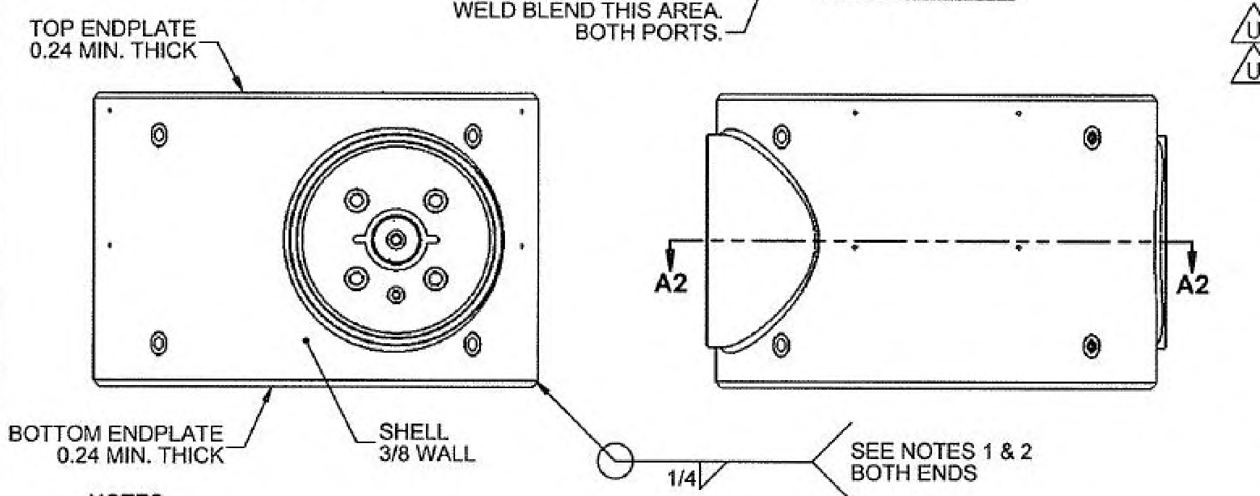
I. Tremblay
Fonctionnaire désignée en vertu de l'alinéa 37(2)(a)
de la Loi sur la sûreté et la réglementation nucléaires

NOTES

Certificat de l’étranger nº USA/9357/B(U)-96 (Rev. 6) ci-joint.

Révision 0 : le 19 février 2013. Demande original.
Révision 1 : le 28 mai 2014. Incorporation de la révision 2 du certificat de l’étranger.
Révision 2 : le 18 juillet 2016. Certificat délivré afin d’incorporer la révision 4 du certificat de l’étranger.
Révision 3 : le 11 mai 2018. Certificat délivré afin d’incorporer la révision 5 du certificat de l’étranger.
Révision 4 : le 7 juillet 2021. Certificat délivré afin d’incorporer la révision 6 du certificat de l’étranger.





LARGE SET SCREW	4	FIREPROOF STAINLESS STEEL
SET SCREW	24	
SHIELD ASSEMBLY	REF	SEE SHEET9
WELDED PORT ASSEMBLY	REF	SEE SHEET 3
SHELL RIVNUT	24	NAS1330N8E-426 PER ASTM A276 OR A493
FOAM FILL	AR	POLYURETHANE, CLOSED CELL FOAM, 18 LBS PER CUBIC FOOT MINIMUM DENSITY
SHIELD RING	2	TYPE 304/304L STN STL PER ASTM A511 ANNEALED CONDITION. PASSIVATED.
SHIELD DISC	AR	TYPE C101 OR C110 COPPER PER ASTM B152
BOTTOM ENDPLATE	1	TYPE 304/304L STN STL PER ASTM A240, A276 OR A666 ANNEALED CONDITION. PASSIVATED OR ELECTROPOLISHED. SHELL ALSO OPTIONALLY PER ASTM A182
TOP ENDPLATE	1	
SHELL	1	
PART NAME	QTY	MATERIAL

NOTES:

1. ALL WELDS ARE EITHER GTAW OR GMAW AND ARE PERFORMED AND INSPECTED BY PERSONNEL QUALIFIED IN ACCORDANCE WITH AWS D1.6 STRUCTURAL WELDING CODE - STAINLESS STEEL OR CERTIFIED TO ASME BOILER AND PRESSURE VESSEL CODE SECTION VIII DIV1. LONGITUDINAL SEAM WELD MAY NOT BE PRESENT WHEN ASTM A182 MATERIAL IS USED.
2. ALL WELDS ARE VISUALLY INSPECTED BY INSPECTORS QUALIFIED TO ASNT SNT-TC-1A REQUIREMENTS.
3. SHIELD RING USED FOR SENTRY 110 (NOT SENTRY 330 OR MODEL 867).
4. COPPER DISC(S) OR SHEET USED AT ALL URANIUM/STEEL INTERFACES.

WELDED BODY ASSEMBLY

ALL TRANSPORT PACKAGE CONFIGURATIONS

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE INCHES & TOLERANCES ±1/16

QSA GLOBAL

40 NORTH AVE, BURLINGTON, MA 01803

DESCRIPTIVE DRAWING

TITLE **SENTRY TRANSPORT PACKAGE**

SIZE	DWG. NO.		REV
A	R86000		U
	SCALE: NONE	SHEET 2 OF 11	

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 B(U)
RADIOACTIVE MATERIALS PACKAGE DESIGN
CERTIFICATE USA/9357/B(U)-96, REVISION 6**

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 - Sentry - Model Nos. Sentry 110, Sentry 330, and Sentry 867.

2. Package Description and Authorized Radioactive Contents - as described in U.S. Nuclear Regulatory Commission Certificate of Compliance No. 9357, Revision 7 (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, 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/9357/B(U)-96, REVISION 6

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. Marking and Labeling - The package shall bear the marking USA/9357/B(U)-96 in addition to other required markings and labeling.

5. Expiration Date - This certificate expires on May 31, 2026. 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 May 19, 2021 petition by QSA Global, Inc., Burlington, MA, and in consideration of other information on file in this Office.

Certified By:

for William Schoonover
Associate Administrator for Hazardous
Materials Safety

May 27, 2021
(DATE)

Revision 6 - Issued to endorse U.S. Nuclear Regulatory Commission Certificate of Compliance No. 9357, Revision 7.

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
9357	7	71-9357	USA/9357/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 January 12, 2021.

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.: SENTRY

(2) Description

The Model No. SENTRY package includes the Model Nos. SENTRY 110, SENTRY 330, and SENTRY 867, as three variations of the same design. The external dimensions of all models in their standard transport configurations, i.e., with the handling rib and link plate assemblies, are identical and are approximately 19 inches (48 cm) wide, 19 inches (48 cm) tall, and 19 inches (48 cm) deep.

The primary components of the SENTRY packages include (i) a depleted uranium shield completely encased and supported in a cylindrically shaped, stainless steel, welded body, (ii) the rear plate lock and front plate assemblies, (iii) the handling rib and link plate, and (iv) the source assembly. The inner cavity of the welded body around the shield is filled with polyurethane foam. The Model Nos. SENTRY 110 and 330 packages can contain only one source wire assembly during transport, while two source wire assemblies can be loaded into the Model No. SENTRY 867 package. The radioactive contents are securely positioned by either a lock slide for the Model Nos. SENTRY 110 and 330 packages or locking pins for the Model No. SENTRY 867 package. All lock assemblies include a dust cover with a plunger lock to prevent rotation of the selector ring and further secure the source in the package during transport.

The optional rib/link assemblies provide lifting attachments and are bolted to the body weldment. The maximum weight, including the optional rib/link assemblies, is 780 pounds (354 kg) for the Model Nos. SENTRY 330 and 867 packages, and 605 pounds (274 kg) for the Model No. SENTRY 110 package.

5.(a) Packaging (continued)

(3) Drawings

The package is constructed in accordance with QSA Global, Inc., Drawing No. R86000, Rev. U, sheets 1-11.

(b) Contents

(1) Type and form of material

Cobalt-60, as a sealed source, which meets the requirements of special form radioactive material.

All source wire assemblies consist of a special form capsule crimped onto the end of a flexible steel wire.

(2) Maximum quantity of material per package:

Co-60: 110 curies (4.0 TBq) for the Model No. SENTRY 110 package.

Co-60: 330 curies (12.2 TBq) for the Model Nos. SENTRY 330 and 867 packages.

(3) Maximum weight of contents:

0.09 pounds (40 grams) for the Model Nos. SENTRY 110 and 330 packages.

0.18 pounds (80 grams) for the Model No. SENTRY 867 package.

The maximum content weight includes the mass of radioactive material and the source capsule handling wire assembly for a shipment containing the maximum number of source wire assemblies that can be transported in a package, i.e., 1 source wire assembly for the Model Nos. SENTRY 110 and 330 packages, and 2 source wire assemblies for the Model No. SENTRY 867 package.

(4) Maximum decay heat: 5.5 watts

6. A cover over the source wire connector prevents access to the source assembly until a keyed lock is actuated and the cover removed. This cover stays in place during transport of the package.

7. The nameplate shall maintain its legibility and be fabricated of materials capable of resisting the fire test of 10 CFR Part 71.

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

    (a) The package shall be prepared for shipment and operated in accordance with the Operating Procedures in Section 7 of the application;

    (b) The package must meet the Acceptance Tests and Maintenance Program of Section 8.0 of the application.

9. Supplemental shielding shall not exceed 5% of the maximum weight of the depleted uranium casting, with a thickness not to exceed 0.5 inch.

10. Revision No. 6 of this certificate may be used until May 31, 2022.

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

12. Expiration date: May 31, 2026.

REFERENCES

QSA Global Inc., application dated January 12, 2021.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

John B. McKirgan

Digitally signed by John B. McKirgan
Date: 2021.05.19 11:39:27 -04'00'

John McKirgan, Chief
Storage and Transportation Licensing Branch
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

Date: 05/17/2021