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/0670/B(U)-96, REVISION 8

REVALIDATION OF UNITED KINGDOM COMPETENT AUTHORITY CERTIFICATE GB/3746B/B(U)-96

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].

1. Package Identification - Model 3746B.

2. Package Description and Authorized Radioactive Contents - as described in United Kingdom Certificate of Competent Authority GB/3746B/B(U)-96, Issue 5 (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.

   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.

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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.

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/0670/B(U)-96 in addition to other required markings and labeling.

5. Expiration Date - This certificate expires on August 31, 2023. 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 173.473 of Title 49 of the Code of Federal Regulations, in response to the August 23, 2018 petition by QSA Global, Inc., Burlington, MA, and in consideration of other information on file in this Office.

Certified By:

William Schoonover
Associate Administrator for Hazardous Materials Safety

September 07, 2018
(DATE)

Revision 8 - Issued to revalidate United Kingdom Certificate of Approval No. GB/3746B/B(U)-96, Issue 5.

CERTIFICATE OF APPROVAL OF PACKAGE DESIGN FOR THE CARRIAGE OF RADIOACTIVE MATERIAL

This is to certify that for the purposes of the Regulations of the International Atomic Energy Agency

- The Competent Authority of Great Britain in respect of inland surface transport, being the Office for Nuclear Regulation;
- The Competent Authority of the United Kingdom of Great Britain and Northern Ireland in respect of sea transport, being the Secretary of State for Transport;
- The Competent Authority of the United Kingdom of Great Britain and Northern Ireland in respect of air transport, being the Civil Aviation Authority; and
- The Competent Authority of Northern Ireland in respect of road transport, being the Department of Agriculture, Environment and Rural Affairs - Northern Ireland

approve the package design specified in Section 1 of this certificate, as submitted for approval by QSA Global Inc. (see Section 5)

as: Type B(U)

by: road and rail in Great Britain; road in Northern Ireland; air; sea.

Packaging identification: 3746B

Packages manufactured to this design meet the requirements of the regulations and codes on page 2, relevant to the mode of transport, subject to the following general condition and to the conditions in the succeeding pages of this certificate.

In the event of any alteration in the composition of the package, the package design, the management system(s) associated with the package or in any of the facts stated in the application for approval, this certificate will cease to have effect unless the Competent Authority is notified of the alteration and the Competent Authority confirms the certificate notwithstanding the alteration.

Expiry Date: This certificate cancels all previous revisions and is valid until the end of August 2023 (see Section 5).

COMPETENT AUTHORITY IDENTIFICATION MARK: GB/3746B/B(U)-96

Signature: Date of Issue: 23 August 2018

Gavin Smith
Head of GB Transport Competent Authority, Land Transport of Radioactive Material
Office for Nuclear Regulation
Redgrave Court, Merton Road
Bootle, Merseyside
L20 7HS

on behalf of the Office for Nuclear Regulation; the Secretary of State for Transport; the Civil Aviation Authority; and the Department of Agriculture, Environment and Rural Affairs - Northern Ireland.

This certificate does not relieve the consignor from compliance with any requirement of the government of any country through or into which the package will be transported.

REGULATIONS GOVERNING THE TRANSPORT OF RADIOACTIVE MATERIALS

INTERNATIONAL

International Atomic Energy Agency (IAEA)
SSR-6 Regulations for the Safe Transport of Radioactive Material 2012 Edition

United Nations Economic Commission for Europe (UNECE)
European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) 2017 Edition

Intergovernmental Organisation for International Carriage by Rail (OTIF)
Regulations concerning the International Carriage of Dangerous Goods by Rail (RID) 2017 Edition

International Maritime Organization (IMO)
International Maritime Dangerous Goods (IMDG) Code 2016 Edition incorporating Amendment 38-16

International Civil Aviation Organization (ICAO)
Technical Instructions for the Safe Transport of Dangerous Goods by Air 2017-2018 Edition

UNITED KINGDOM

ROAD
GREAT BRITAIN ONLY:
The Energy Act 2013 (2013 c. 32); The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (SI 2009 No. 1348); The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment (Amendment) Regulations 2011 (SI 2011 No. 1885); The Energy Act 2013 (Office for Nuclear Regulation) (Consequential Amendments, Transitional Provisions and Savings) Order 2014 (SI 2014 No. 469)

NORTHERN IRELAND ONLY:
The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations (Northern Ireland) 2010, SR 2010 No 160; The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment (Amendment) Regulations (Northern Ireland) 2011, No 365

RAIL
GREAT BRITAIN ONLY:
The Energy Act 2013 (2013 c. 32); The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (SI 2009 No. 1348); The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment (Amendment) Regulations 2011 (SI 2011 No. 1885); The Energy Act 2013 (Office for Nuclear Regulation) (Consequential Amendments, Transitional Provisions and Savings) Order 2014 (SI 2014 No. 469)

SEA
British registered ships and all other ships whilst in United Kingdom territorial waters:
The Merchant Shipping Act 1995 (1995 c. 21); The Merchant Shipping (Dangerous Goods and Marine Pollutants) Regulations 1997 (SI 1997 No. 2367); Merchant Shipping Notice MSN 1875 (M) The Carriage of Dangerous Goods and Marine Pollutants in Packaged Form: Amendment 38-16 to the International Maritime Dangerous Goods (IMDG) Code

AIR
The Air Navigation Order 2016 (SI 2016 No. 765); The Air Navigation (Dangerous Goods) Regulations 2002 (SI 2002 No.2786); The Air Navigation (Dangerous Goods) (Amendment) Regulations 2017 (SI 2017 No.28)

1. DESIGN SPECIFICATION

Package Design

1.1 The package design specification shall be in accordance with High Technology Sources Limited Package Design Safety Report reference RS 0139 Issue 5 dated 13 October 2017, and modifications to the package design approved by the authorities named on page 1 of this certificate under the established modifications procedure.

Design Drawings

1.2 The design is specified in the following drawings.

Design No.	Title (number of components)	Drawing / Drawing List	Issue
	Drawing List	RS0138	2
3746B	General Arrangement	JB133/000	B
3746	Outer / Steel Drum Assembly	JB132/010	B
P500	Pot Assembly (one)	JB133/020	B
Approved IAEA SF Capsule	Various	As valid	As valid

Package Description and Materials of Manufacture

1.3 The package outer is a carbon steel drum, with a full diameter lid and a stainless steel clamp-band. Two handles provide for lifting and for tie-down. Impact and thermal protection is provided by the drum and a cork liner whilst a lead pot provides radiation shielding. The pot can have tungsten or depleted uranium inserts for additional radiation shielding. The pot holds special form capsules of iridium-192 and selenium-75. See Appendix 1 for package illustration.

Package Dimension and Weights

1.4 Nominal dimensions: 325 mm diameter x 405 mm height

1.5 Maximum authorised gross weight: 54.0 kg

Authorised Contents

1.6 Authorised radioactive contents:

a) Metallic iridium or selenium intermetallic alloy encapsulated as approved and valid IAEA Special Form Capsule Material.
b) The maximum activity of iridium-192 in the package is limited to a source output of 7.4 TBq when using the depleted uranium insert.
c) The maximum activity of iridium-192 in the package is limited to a source output of 3.4 TBq when using the tungsten insert.
d) The maximum activity of selenium-75 in the package is limited to 12 TBq when using either insert.
e) Maximum heat load is limited to 2.78 W generating surface flux of 5.6 W/m^2.
f) When any combination of the radionuclides referred to in 1.6.b, 1.6.c and 1.6.d is to be carried; they shall be limited such that the sum of the proportionate amounts of each radionuclide present with respect to the quantities shown does not exceed one.

Containment System

1.7 The containment for the radioactive material is the stainless steel or titanium of the special form source capsules which are closed by welding.

2. USE OF PACKAGE

Information Provided in Safety Report on Use of Packaging

2.1 The packaging shall be used, handled and maintained in accordance with the requirements of HTSL-HPI 129 Issue 5 dated 13 October 2017.

Actions Prior to Shipment

2.2 Administrative controls shall ensure that the contents are in accordance with Section 1 of this certificate, and that the consignor and consignee hold a copy of the instructions on the use of the packaging.

2.3 The package is not required to reach thermal equilibrium prior to shipment.

Ambient Temperature Range for Package Design

2.4 -40ºC to +38ºC

2.5 -40ºC to +55ºC for air

Emergency Arrangements

2.6 Before shipment takes place, suitable emergency plans will have been drawn up, copies of which shall be supplied to the GB Competent Authority on demand.

2.7 Within Great Britain, if the consignor's own, or other approved emergency plans, cannot be initiated for any reason, then the police shall be informed immediately and requested to call NAIR (National Arrangements for Incidents involving Radioactivity).

3. MANAGEMENT SYSTEMS

3.1 The management system(s) assessed as adequate in relation to this design by the authorities named on page 1 of this certificate, at the date of issue comprise the following:

- HTSL Quality Manual (QCP1011); and
- QSA Global Quality Programme (QSM-1) as specified in RS 0139 Issue 5 dated 13 October 2017.

3.2 No alteration may be made to any management system confirmed as adequate in relation to this design, unless:

a) the authorities named on page 1 of this certificate have confirmed the amended management system is adequate prior to implementation or use; or
b) the alteration falls within the agreed change control procedures set out in the management system(s).

3.3 Other management systems for design, testing, manufacture, documentation, use, maintenance, inspection, transport and in-transit storage operations may be used providing they comply with international, national or other standards for management systems agreed as acceptable by the authorities named on page 1 of this certificate.

4. ADMINISTRATIVE INFORMATION

Shipment Approval

4.1 There is no requirement for a shipment approval.

Packaging Serial Numbers

4.2 This design approval applies only to packaging serial numbers 001 to 122.

4.3 For the purpose of compliance with ADR / RID, the owner of the packaging shall be responsible for informing ONR of the serial number of each packaging manufactured to this design.

Additional Technical Data / Information

4.4 At the time of completion of this design approval certificate, The Ionising Radiations Regulations 2017, SI 2017 No. 1075 and Approved Code of Practice apply, with regard to radiation protection, to all modes of transport and The Dangerous Substances in Harbour Areas Regulations 2016, SI 2016 No. 721, apply in UK Ports.

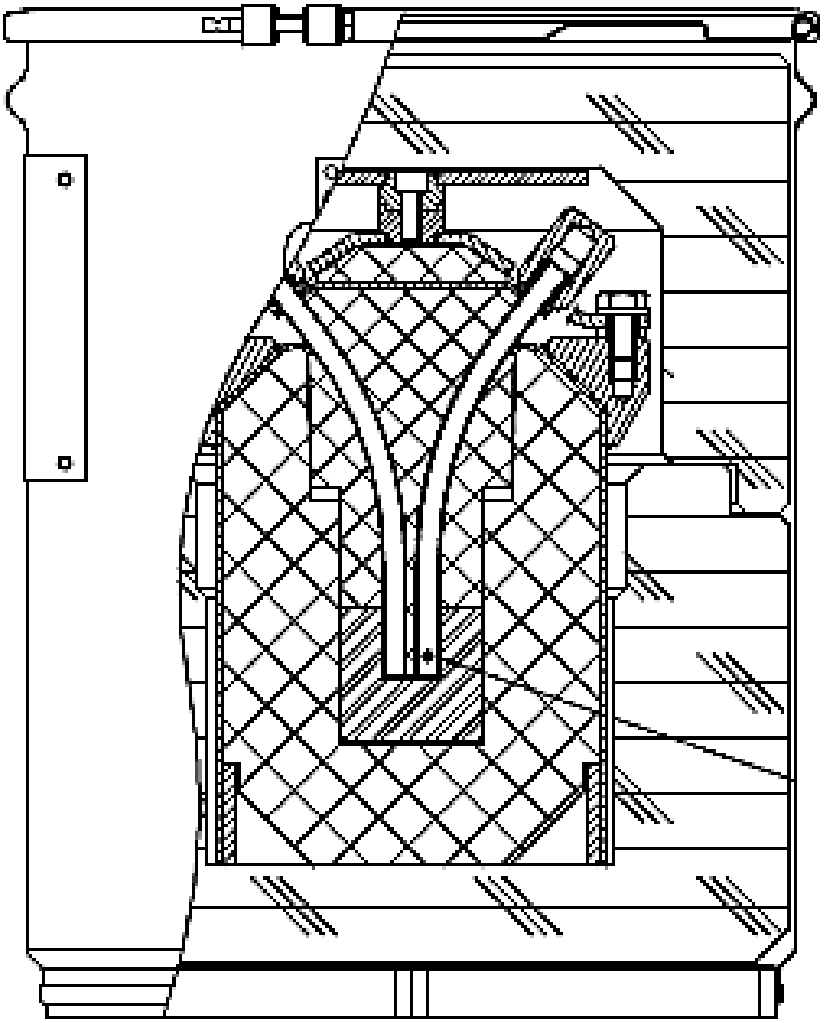
5. CERTIFICATE STATUS

Design approval issued to:

QSA Global Inc.
40, North Avenue
Burlington, MA 01803
USA

Revision / Issue Number	Date of Issue	Date of Expiry	Reason for Revision
1	06 February 2004	End of February 2007	First issue under new regulations
2	14 February 2008	End of February 2013	Renewal and change of ownership
3	22 January 2013	End of February 2018	Renewal
4	28 February 2018	End of August 2018	Extension
5	23 August 2018	End of August 2023	Renewal

APPENDIX 1 - PACKAGE ILLUSTRATION



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Transportation

**Pipeline and
Hazardous Materials
Safety Administration**

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

CERTIFICATE NUMBER: USA/0670/B(U)-96

ORIGINAL REGISTRANT(S):

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USA

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