



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/9269/B(U)-96, REVISION 7**

East Building, PHH-23
1200 New Jersey Avenue Southeast
Washington, D.C. 20590

This certifies that the radioactive material package design described has been certified by the Competent Authority of the United States as meeting the regulatory requirements for a Type B(U) packaging for radioactive material as prescribed in the regulations of the International Atomic Energy Agency¹ and the United States of America².

1. Package Identification - Model 650L Source Changer.
2. Package Description and Authorized Radioactive Contents - as described in U.S. Nuclear Regulatory Commission Certificate of Compliance No. 9269, Revision 6 (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 Hazardous Materials Technology, (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.

¹ "Regulations for the Safe Transport of Radioactive Material, 1996 Edition (Revised), No. TS-R-1 (ST-1, Revised)," published by the International Atomic Energy Agency(IAEA), Vienna, Austria.

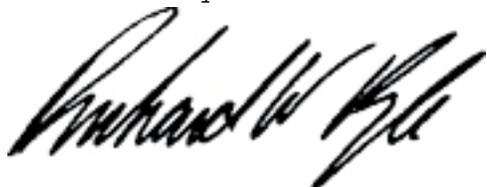
² Title 49, Code of Federal Regulations, Parts 100-199, United States of America.

CERTIFICATE USA/9269/B(U)-96, REVISION 7

- d. Records of Quality Assurance activities required by Paragraph 310 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.
4. Special Condition - In accordance with paragraph 11 of the NRC Certificate USA/9269/B(U)-96, Revision 6, the previous revision of this certificate (Revision 6) may be used until September 30, 2011.
5. Marking and Labeling - The package shall bear the marking USA/9269/B(U)-96 in addition to other required markings and labeling.
6. Expiration Date - This certificate expires on November 30, 2015. On November 30, 2011, this certificate supersedes all previous revisions of USA/9269/B(U)-96.

This certificate is issued in accordance with paragraph 808 of the IAEA Regulations and Section 173.471 of Title 49 of the Code of Federal Regulations, in response to the September 20, 2010 petition by QSA Global, Inc., Burlington, MA, and in consideration of other information on file in this Office.

Certified By:



Dr. Magdy El-Sibaie
Associate Administrator for Hazardous Materials Safety

Oct 22 2010
(DATE)

Revision 7 - Issued to endorse U.S. Nuclear Regulatory Commission Certificate of Compliance No. 9269, Revision 6.

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
9269	6	71-9269	USA/9269/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*)
- b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION

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

QSA Global, Inc., application dated
August 3, 2010, as supplemented.

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.: 650L
- (2) Description

A welded stainless steel encased, uranium shielded, Iridium-192 or Selenium-75 source changer. Primary components consist of a welded carbon steel shell, internal supports, depleted uranium shield, and a titanium "U" tube. The tube is crimped in the middle of the "U" to provide a positive stop for the source assembly. The Model No. 650L has two source locking assemblies, mounted on the top cover plate, that are used to secure the radioactive source in a shielded position during transport. The packaging measures approximately 10-inches (254 mm) wide, 13.25-inches (337 mm) high and 8.25-inches (210 mm) deep. The maximum weight of the packaging is 90 pounds (41 kg).

- (3) Drawings

The packaging is constructed in accordance with QSA Global, Inc., Drawing No. R65006, Rev. J, sheets 1-5.

(b) Contents

- (1) Type and form of material

Iridium-192 as sealed sources which meet the requirements of special form radioactive material.

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

1.	a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGE
	9269	6	71-9269	USA/9269/B(U)-96	2	OF 3

5. (b) Contents (continued)

Selenium-75 as sealed sources which meet the requirements of special form radioactive material.

(2) Maximum quantity of material per package

Ir-192: 240 curies (8.9 TBq) (output)

Se-75: 300 curies (11.1 TBq) (output)

Output curies are determined by measuring the source output at 1 meter and expressing its activity in curies derived from the following: 0.48 R/(h-Ci) Iridium-192 at 1 meter (Ref: American National Standard N432-1980, "Radiological Safety for the Design and Construction of Apparatus for Gamma Radiography") and 0.2 R/(h-Ci) Selenium-75 at 1 meter (Ref: U.S. Public Health Service, Bureau of Radiological Health, 1970. Radiological Health Handbook, Rockville, MD).

(3) Maximum weight of contents

0.08 pounds (36 grams), including the mass of radioactive material and the weight of the source capsule handling wire assembly for a shipment containing two source wire assemblies.

(4) Maximum decay heat

Ir-192: 4.8 Watts

Se-75: 1.52 Watts

6. The source shall be secured in the shielded position of the packaging by the source assembly. The source assembly must be fabricated of materials capable of resisting a 1475°F fire environment for one-half hour and maintaining its positioning function. The cable of the source assembly must engage the source hold-down assembly. The flexible cable of the source assembly must be of sufficient length and diameter to provide positive positioning of the source at the crimp of the "U" tube.

7. The nameplates shall be fabricated of materials capable of resisting the fire test of 10 CFR Part 71 and maintaining their legibility.

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

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

(b) The packaging shall be maintained in accordance with the Maintenance Program in Chapter 8 of the application.

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGE
9269	6	71-9269	USA/9269/B(U)-96	3 OF	3

9. Fabrication of new packagings is not authorized. However, fabrication of replacement components needed to support shipment of existing packages is authorized, except for the depleted uranium shield and the inner carbon steel shell.
10. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.
11. Revision No. 5 of this certificate may be used until September 30, 2011.
12. Expiration date: November 30, 2015.

REFERENCES

QSA Global, Inc., application dated August 3, 2010.
Supplements dated August 11 and 25, 2010.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION



Eric J. Benner, Chief
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Date: September 17, 2010



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

SAFETY EVALUATION REPORT
Model No. 650L Package
Certificate of Compliance No. 9269
Revision No. 6

SUMMARY

By application dated August 3, 2010, supplemented August 11 and 25, 2010, QSA Global, Inc., (QSA) requested renewal of the Certificate of Compliance No. USA/9269/B(U)-96 for the Model No. 650L package. QSA submitted a consolidated application and requested that the package application review includes consideration of NUREG-1886, "Joint Canada-United States Guide for Approval of Type B(U) and Fissile Material Transportation Packages."

QSA increased the package contents to include up to two source wire assemblies and made minor clarifications in the application and to Drawing No. R 65006.

NRC staff reviewed the application using the guidance in NUREG-1609, "Standard Review Plan for Transportation Packages for Radioactive Material." Based on the statements and representation in the application, and the conditions listed below, the staff concludes that the package meets the requirements of 10 CFR Part 71. Staff also reviewed the application against NUREG-1886, "Joint Canada-United States Guide for Approval of Type B(U) and Fissile Material Transportation Packages," and found that the highlighted areas of emphasis have been appropriately addressed. The certificate has been renewed for a five year term.

EVALUATION

By application dated August 3, 2010, supplemented August 11 and 25, 2010, QSA Global, Inc., (QSA) requested renewal of the Certificate of Compliance No. USA/9269/B(U)-96 for the Model No. 650L package. QSA submitted a consolidated application and requested that the package application review includes consideration of NUREG-1886.

The applicant revised the maximum weight of the contents, i.e., 36 grams, to include the mass of the radioactive materials and the mass of the source capsule handling wire assembly for a shipment containing two source wire assemblies. The revision does not modify the package center of gravity or the package maximum mass, as evaluated and tested. According to Test Plan 80, Revision 1, included in the application, the weight of the projectors used in testing was 41 kg. Therefore, the staff finds that the applicant's request is reasonable and does not require any additional engineering evaluation.

The thermal design of the Model No. 650L package, used to transport special form radioactive material (Ir-192 or Se-75), with a maximum content weight of 36 grams and a maximum decay heat of 4.8 watts for Ir-192 and 1.52 watts for Se-75 respectively, is adequately evaluated. An expanded description of the thermal testing that demonstrated compliance with 10 CFR 71.73(c)(4) was included in the amendment. In the test description, the applicant noted that the depleted uranium shield was cracked and that thermal testing did lead to further shield degradation; however, a radiation profile of the device showed a radiation level of 28 mR/hr at

one meter, well below the allowable level of 1,000 mR/hr at one meter. The thermal performance of the package meets the thermal requirements of 10 CFR Part 71.

Safety-related fasteners were specified as meeting widely accepted industry standards; the minimum mechanical properties of the fasteners, including the yield strength, the tensile strength, and elongation to failure, are stated on the licensing drawings. The staff finds these standards and minimums acceptable, and in compliance with Section 2.5.2.1 of NUREG 1609, "Standard Review Plan for Transportation Packages for Radioactive Material."

The amendment made several additions to Table No. 2.2.A in the application to list the materials and the typical mechanical properties for those materials used in the Model No. 650L package. However, the minimum mechanical properties of the materials used in the package are mandated by specifications and standards described in the licensing drawings.

The amendment also expanded upon the acceptance testing used to demonstrate the performance of the depleted uranium shield in Section No. 8.1.6 of the application. The acceptance test is a radiation survey that would identify any significant void volumes within the shield. The staff finds this method acceptable and has approved it on previous QSA applications.

The applicant stated that there will be no fabrication of new Model No. 650L packages. Only fabrication of replacement components needed to support continued use of existing packages is authorized. Replacement components do not include the depleted uranium shield and the inner carbon steel shell. Those items can no longer be fabricated.

Under the Division of Spent Fuel Storage and Transportation (SFST) review procedures, the staff would normally require a greater level of detail in the licensing drawings for approval of a Type B(U)-96 package. However, the Model No. 650L package has been safely operated with no reported incidents.

The staff reviewed the consolidated application, as supplemented, and determined that the required documentation is available and complete. No changes were made to the operating and maintenance procedures.

Changes to Certificate of Compliance

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

Item No. 3(b) was updated to identify the application dated August 3, 2010.

Condition No. 5(a)(2) was updated to clarify the description of the packaging.

Condition No. 5(a)(3) was updated to include Revision J of Drawing No. R 65006.

Condition No. 5(b)(3) was added to indicate the maximum weight of the contents, including the weight of the source capsule handling wire assembly.

Condition No. 5(b)(4) was added to indicate the maximum decay heat for Ir-192 and Se-75.

Condition No. 8(b) was modified to include only maintenance of the package since fabrication of new packagings is not authorized.

New Condition No. 9 was included in the Certificate of Compliance to clarify that fabrication of replacement components is authorized, except for the depleted uranium shield and the inner carbon steel shell of the package.

As a consequence of the inclusion of the new Condition No. 9, the previous Conditions Nos. 9-11 were renumbered 10-12, respectively.

Condition No. 11 was revised to authorize use of the previous revision of the certificate for a period of approximately one year.

Condition No. 12 was revised to change the expiration date of the Certificate of Compliance to November 30, 2015.

The consolidated application, dated August 3, 2010, and the supplements dated August 11 and 25, 2010, were included in the References section.

CONCLUSION

The certificate has been renewed for a five year term which expires on November 30, 2015. Based on the statements and representations contained in the application, and the conditions listed above, the staff concludes that the design of the Model No. 650L package has been adequately described and evaluated. The staff concludes that the changes indicated do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9269, Revision No. 6,
on September 14, 2010.



U.S. Department
of Transportation

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

**Pipeline and
Hazardous Materials
Safety Administration**

CERTIFICATE NUMBER: USA/9269/B(U)-96, Revision 7

ORIGINAL REGISTRANT(S):

Ms. Lori Podolak
Product Licensing Specialist
QSA Global, Inc.
40 North Avenue
Burlington, MA 01803

Ms. Cathleen Roughan
Director, Regulatory Affairs and QA
QSA Global, Inc.
40 North Avenue
Burlington, MA 01803

Mr. Michael Fuller
Regulatory Compliance Associate
QSA Global, Inc.
40 North Avenue
Burlington, MA 01803

REGISTERED USER(S):

Frank Marcinowski
Headquarters Certifying Official
Department of Energy
U.S. Dept. of Energy, EM-10
1000 Independence Ave., SW
Washington, DC 20585

Dae Chung
Department of Energy
1000 Independence Ave
Washington, DC 20585

Dr. James M. Shuler
Manager, Packaging Certification Program
Department of Energy
U.S. Department of Energy
1000 Independence Ave, SW
EM-60
Washington, DC 20585

Mr. Mark A. Gilbertson
Department of Energy
Washington, 20585
USA

Kelly Richardt
Regulatory and Quality Manager
Source Production and Equipment Company
113 Teal St.
St. Rose, 70087
USA

Mr. R.D. Donny Dicharry
President
Source Production and Equipment Company
113 Teal Street
St. Rose, 70087-9691
USA

Mr. Mike Rose
Industrial Nuclear Company, Inc.
14320 Wicks Blvd.
San Leandro, CA 94577

Bill Huddleston
Industrial Nuclear Company, Inc.
14320 Wicks Blvd
San Leandro, 94577
USA

Jerry Tucker
Industrial Nuclear Company, Inc.
14320 Wicks Blvd
San Leandro, 94577
USA

Mr. Patrick Buck
Radiation Safety Officer
CIS-US (Pharmalucence)
10 DeAngelo Drive
Bedford, 01730
USA

Robert J. Slack
Director of Regulatory Affairs
MISTRAS Holdings Group, CONAM Inspection & Engineering Services, Inc
899 Carol Court
Carol Stream, IL 60188

T. L. Finkenbinder
Radiation Safety Officer
Western Industrial X-Ray
1707 Enterprise Drive
Unit J
P.O. Box 238
Fairfield, CA 94533

Mr. Eric Mitchell
Manager QA/NDT
American Airlines
Radiation Safety Officer
3900 N. Mingo Road; MD 35
Tulsa, 74116
USA