



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

June 27, 2012

Ms. Lori Podolak
Senior Regulatory Affairs Specialist
Regulatory Affairs Department
QSA Global, Inc.
40 North Avenue
Burlington, MA 01803

SUBJECT: REVISION NO. 1 OF CERTIFICATE OF COMPLIANCE NO. 9357 FOR THE
MODEL NO. SENTRY PACKAGE

Dear Ms. Podolak:

As requested by your application dated May 22, 2012, enclosed is Certificate of Compliance No. 9357, Revision No. 1, for the Model No. SENTRY package. The staff's Safety Evaluation Report is also enclosed.

This approval constitutes authority to use the package for shipment of radioactive material and for the package to be shipped in accordance with the general license provisions of 10 CFR 71.17 and the provisions of 49 CFR 173.471.

If you have any questions regarding this certificate, please contact Pierre Saverot of my staff at (301) 492-3408.

Sincerely,

A handwritten signature in cursive script, appearing to read "Michael D. Waters".

for Michael D. Waters, Chief
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9357
TAC No. L24646

Enclosures: 1. Certificate of Compliance No. 9357, Rev. No. 1
2. Safety Evaluation Report

cc w/encls: R. Boyle, Department of Transportation
J. Shuler, Department of Energy

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

1. a. CERTIFICATE NUMBER 9357	b. REVISION NUMBER 1	c. DOCKET NUMBER 71-9357	d. PACKAGE IDENTIFICATION NUMBER USA/9357/B(U)-96	PAGE 1	PAGES OF 3
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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 April 20, 2011.

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 Model No. SENTRY package 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 580 pounds (263 kg) for the Model No. SENTRY 110 package.

**CERTIFICATE OF COMPLIANCE
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1.	a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
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(3) Drawings

The package is constructed in accordance with QSA Global, Inc., Drawing No. R86000, Rev. E, sheets 1-10.

(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 (4.07 TBq) (output) for the Model No. SENTRY 110 package.

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

Output curies are determined by measuring the source output at 1 meter and expressing its activity in curies derived from the following: 1.30 R/(h-Ci) (Ref: American National Standards Institute N432-1980, "Radiological Safety for the Design and Construction of Apparatus for Gamma Radiography").

(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.

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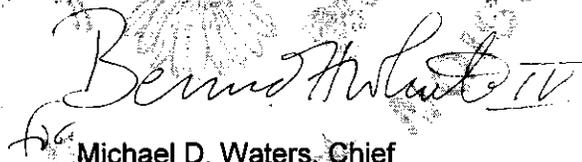
8. In addition to the requirements of Subpart G of 10 CFR Part 71:
- (a) The package shall be prepared for shipment and operated in accordance with the Operating Procedures in Section 7 of the application;
 - (b) The package must meet the Acceptance Tests and Maintenance Program of Section 8.0 of the 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. 0 of this certificate may be used until June 30, 2013.
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: July 30, 2016.

REFERENCES

QSA Global Inc., application dated April 20, 2011.

Supplement dated May 22, 2012.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION



Michael D. Waters, Chief
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Date: June 27 2012.



UNITED STATES
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SAFETY EVALUATION REPORT
Model No. SENTRY Package
Certificate of Compliance No. 9357
Revision No. 1

SUMMARY

By application dated May 1, 2012, supplemented May 15 and May 22, 2012, QSA Global, Inc., submitted an amendment request for the Model No. SENTRY package. The amendment request, dated May 22, 2012, supersedes in its entirety the original application dated May 1, 2012, supplemented May 15, 2012.

The package, designed for the transport of Type B quantities of special form ^{60}Co radioactive material, includes three models, the Model Nos. SENTRY 110, SENTRY 330, and SENTRY 867. These models share the same common design but incorporate some variations to improve their functionality as radiography devices. The applicant requested to be allowed (i) the use of lockwashers and thread lubricant in place of the approved threadlocker configuration, and (ii) to use supplemental depleted uranium (DU) disks to the shield surface area where initial shield profiles indicate the unit may exceed the allowable transport limits.

NRC staff reviewed the amendment request using the guidance in NUREG 1609, "Standard Review Plan for Transportation Packages for Radioactive Material." Based on the statements and representations in the application, and the conditions listed below, the staff concludes that the package meets the requirements of 10 CFR Part 71.

EVALUATION

The applicant requested the optional use of lockwashers in combination with thread lubricant in place of threadlockers for the 48 screws and four bit bolts shown on sheet No. 4 of licensing drawing R86000, Rev. E. The staff finds this acceptable: such use does not impact the package's ability to meet the regulatory requirements of 10 CFR 71.51(a) since the aforementioned screws and bolts are not important to safety and have no torque requirements associated with their use.

The thread lubricant on sheet No. 4 of licensing drawing R86000, Rev. E, is described as "Aluminum, copper and graphite blend" and has not changed from the previously approved licensing drawing R86000, Rev. C. The applicant is aware of the potential for chloride-induced stress corrosion cracking (SCC) and uses lubricants, e.g., either "aluminum, copper, and graphite mixtures" or lubricants meeting MIL-PRF-23827C, that generally preclude the intentional addition of halide-bearing compounds that could potentially induce SCC. The applicant provided technical specifications that show that the Permatex lubricant does not contain any chlorides. The staff finds the use of non-chloride bearing lubricants in compliance with 10 CFR 71.43(d).

The applicant also requested to be allowed to attach supplemental DU disks to the shield surface when the initial shield profiles indicate that the finished package may exceed the allowable transport limits. The supplemental DU disks are temporarily taped or strapped to the shield until the addition of the polyurethane foam during the package fabrication process. Once solidified, the foam retains the added shielding in place and prevents any movement. The use of such supplemental shielding has been approved by staff for QSA Model Nos. 660, 680, and 741 with Docket Nos. 71-9283, 71-9035, and 71-9027, respectively. The supplemental shielding is not required to meet the requirements of 10 CFR 71.51(a)(2) under accident conditions. Based on previous approvals of similar packages designed, owned, or fabricated by QSA, and an operational history with no compliance issues as a result of the supplemental shielding with similar designs, the staff finds the use of supplemental shielding and the related temporary attachments acceptable for the Model No. SENTRY package.

The use of supplemental shielding does not change the currently approved shield weights for these packages, as listed on sheet No. 9 of licensing drawing R86000, Rev. E. The maximum DU thickness added is effectively limited by the radiation dose limits listed in note 6 on sheet No. 9 of that drawing, as shield's dose measurements that could be outside the regulatory limits would not be acceptable for supplemental shielding in this manner and would be rejected.

As specified on licensing drawing R86000, Rev. E, the ability to add DU shielding to the existing shield, that needs only minor spot shielding added to a limited area, is actually more limiting than what was previously allowed. This added shielding does not constitute the majority or even a significant portion of the composite shield weight.

The staff reviewed the application, as supplemented, and determined that the required documentation is available and complete.

Changes to Certificate of Compliance

The following changes have been made to the Certificate:

Condition No. 5 (a)(3) was updated to include Revision E of Drawing No. R86000.

Condition No. 9 was changed to specify that the supplemental shielding shall not exceed 5% of the DU casting, with a thickness not to exceed 0.5 inch.

Condition No. 10 was changed to authorize use of the previous revision of the certificate for a period of approximately one year.

Condition Nos. 9 and 10 of Revision 0 of the Certificate were renumbered Condition Nos. 11 and 12.

The May 22, 2012, submittal was included in the References section.

CONCLUSION

Based on the statements and representations contained in the application, and the conditions listed above, the staff concludes that the Model No. SENTRY package has been adequately described and evaluated and that the package meets the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9357, Revision No. 1,
on June 27, 2012.