September 13, 2013

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

SUBJECT: REVISION NO. 2 OF CERTIFICATE OF COMPLIANCE NO. 9357 FOR THE MODEL NO. SENTRY TRANSPORTATION PACKAGE

Dear Ms. Podolak:

As requested by your application dated July 19, 2013, enclosed is Certificate of Compliance No. 9357, Revision No. 2, for the Model No. SENTRY transportation package. Changes made to the enclosed certificate are indicated by vertical lines in the margin. The staff's safety evaluation report is also enclosed.

The approval constitutes authority to use the package for shipment of radioactive material and for the package to be shipped in accordance with the provisions of 49 CFR 173.471. Those on the attached list have been registered as users of the package under the general license provisions of 10 CFR 71.17 or 49 CFR 173.471.

If you have any questions regarding this certificate, please contact me or Huda Akhavannik of my staff at (301) 287-9241.

Sincerely,

**/RA/**

Michele Sampson, Chief
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9357
TAC No. L24772

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

Upon removal of Enclosure 3, this document is uncontrolled

cc w/encls 1 & 2: R. Boyle, Department of Transportation
J. Shuler, Department of Energy, c/o L. F. Gelder

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

SUBJECT: REVISION NO. 2 OF CERTIFICATE OF COMPLIANCE NO. 9357 FOR THE MODEL NO. SENTRY TRANSPORTATION PACKAGES

Dear Ms. Podolak:

As requested by your application dated July 19, 2013, enclosed is Certificate of Compliance No. 9357, Revision No. 2, for the Model No. SENTRY transportation packages. Changes made to the enclosed certificate are indicated by vertical lines in the margin. The staff's safety evaluation report is also enclosed.

The approval constitutes authority to use the package for shipment of radioactive material and for the package to be shipped in accordance with the provisions of 49 CFR 173.471. Those on the attached list have been registered as users of the package under the general license provisions of 10 CFR 71.17 or 49 CFR 173.471.

If you have any questions regarding this certificate, please contact me or Huda Akhavannik of my staff at (301) 287-9241.

Sincerely,

**/RA/**

Michele Sampson, Chief
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9357
TAC No. L24772

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

Upon removal of Enclosure 3, this document is uncontrolled

cc w/encls 1 & 2: R. Boyle, Department of Transportation
J. Shuler, Department of Energy, c/o L. F. Gelder

G:SFST\Part 71 Casework\9357.R2.LTR&SER.doc
G:SFST\Part 71 Casework\9357.R2.doc
**ADAMS P8 Package No.: ML13256A120 ADAMS P8 Accession No.: ML13256A124**

| **OFC** | NMSS/SFST | NMSS/SFST | NMSS/SFST | NMSS/SFST | NMSS/SFST | NMSS/SFST | NMSS/SFST |
|---|---|---|---|---|---|---|---|
| **NAME** | HAkhavannik | MDeBose | ITseng | ASotomayor-Rivera | DTang | MRahimi | MSampson |
| **DATE** | 9/5/13 | 9/5/13 | 9/5/13 | 9/9/13 | 9/6/13 | 9/11/13 | 9/13/13 |

C = COVER E = COVER & ENCLOSURE N = NO COPY
OFFICIAL RECORD COPY

**SAFETY EVALUATION REPORT**
**Docket No. 71-9357**
**Model No. SENTRY**
**Certificate of Compliance No. 9357**
**Revision No. 2**

## SUMMARY

By application dated July 19, 2013, QSA Global, Inc., requested an amendment to Certificate of Compliance No. 9357, for the Model No. SENTRY transportation packages. The Model No. SENTRY transportation packages consist of the Model Nos. SENTRY 110, SENTRY 330, and SENTRY 867. For the Model No. SENTRY 110, QSA Global requested increasing the maximum depleted uranium shield weight thereby increasing the overall weight of the package. For the Model Nos. SENTRY 330 and SENTRY 867, QSA Global requested adding additional source wire assemblies, A424-13, A424-15, A424-18, and 943, in addition to the already approved A424-14 source wire assembly. For all the package models, QSA Global requested reducing the minimum thickness of the rear plate assemblies. Staff reviewed these changes and concludes that they do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

## EVALUATION

By application dated July 19, 2013, QSA Global, Inc., requested an amendment to Certificate of Compliance No. 9357, for the Model No. SENTRY transportation packages. The Model No. SENTRY transportation packages consist of the Model Nos. SENTRY 110, SENTRY 330, and SENTRY 867. For the Model No. SENTRY 110, QSA Global requested increasing the maximum depleted uranium shield weight thereby increasing the overall weight of the package. For the Model Nos. SENTRY 330 and SENTRY 867, QSA Global requested adding additional source wire assemblies, A424013, A424-15, A424-18, and 943, in addition to the already approved A424-14 source wire assembly. For all the package models, QSA Global requested reducing the minimum thickness of the rear plate assemblies.

As part of their application, QSA Global revised their licensing drawings. QSA Global revised the drawings to include the 25 pound weight increase to the Model No. SENTRY 110, an updated depleted uranium shield weight, and a note specifying initial radiation measurements for the supplemental depleted uranium shielding. Additionally, the licensing drawings have been updated to include a new minimum thickness of the rear plate assembly of 0.12 MIN and to include the names of the new source wire assemblies. In their safety analysis report, the general description of the package and the operating procedures have been updated to include the increased package weight for the Model No. SENTRY 110.

*Structural Evaluation*

The staff reviewed the increased maximum package weight and depleted uranium shield weight for the basic and standard configuration of the Model No. SENTRY 110 package configuration. These weight increases are acceptable because the effect of the added weight is bounded by

the testing performed on the Model Nos. SENTRY 330 and SENTRY 867, which are a similar design to the revised Model No. SENTRY 110, but with a higher maximum shield weight. On the reduction in the minimum thickness of the rear plate assemblies, the staff finds that it does not affect the thickness of the plate near the attachment bolts. Thus, the thickness reduction will have negligible impact on the safety function of the package because the affected portion of the rear plate is not associated with anticipated system failure modes.

*Shielding Evaluation*

The staff reviewed the shielding performance for the Model Nos. SENTRY 110, SENTRY 330, and SENTRY 867. All dose rate measurements were based on direct measurement for both normal conditions of transport (NCT) and hypothetical accident conditions (HAC). Results from tests, as well as additional radiation profiles, were provided in the amendment. Radiation measurements were taken using the existing method approved in previous revisions. These measurements did not show an increase in external surface radiation levels above 200-mrem/hr after any NCT test and above 10 mrem/hr at 1 meter from the package's external surface after HAC tests.

Wire sources added to the Model Nos. SENTRY 330 and SENTRY 867 packages were evaluated as part of this amendment. Since the shielding evaluation is based on direct measurement, flux rates were not used to convert to dose rates in any shielding evaluation. The maximum adjusted dose rates for the Model Nos. SENTRY 330 and SENTRY 867 packages during NCT for non-exclusive use transport were well below 200 mrem/hr at the surface of the package and 10 mrem/hr at a distance of one meter from the surface. The dose rates were also well below 1000 mrem/hr at one meter during HAC for non-exclusive use.

The active center of radiation material for the A424-15 and A424-18 source wire assemblies were located closer to the exterior package. For that reason, the applicant performed some radiation profiles to determine the maximum dose rate from the Model No. SENTRY 867 when loaded with these sources. For the A424-15 (11 Ci), maximum measured surface dose rate was 99 mrem/hr and 4.8 mrem/hr at 1 meter from the package surface. For the A424-18 (33 Ci), maximum measured surface dose rate was 53 mrem/hr and 1.08 mrem/hr at 1 meter from the package surface. Maximum dose rates from the Model SENTRY 867 when transporting the A424-14, A424-18, and 943 source wire assemblies are bounded by the values shown in Table 5.1f for the A424-13 source wire. For the A424-13 source wire, the maximum dose rate at the surface is 139 mrem/hr.

These values comply with the requirements of 10 CFR 71.47(a). Under HAC, the maximum dose rates measured were 1.08 mrem/hr at a distance of one meter, which meets the requirements of 10 CFR 71.51(a)(2).

Based on review of the statements and representations in the amendment, the staff concludes that the design of the Model No. SENTRY package has been adequately described and evaluated and that the package meets the requirements of 10 CFR Part 71.

**CONDITIONS**

Condition No. 5.(a)(2), "Description," has been updated to include the increased weight of the Model No. SENTRY 110.

Condition No. 5.(a)(3), “Drawings,” has been updated to reflect the latest revision of the licensing drawings.

Condition No. 10, “Revision No. 0 of this certificate may be used until June 30, 2013,” has been changed to, “Revision No. 1 of this certificate may be used until September 30, 2014.”

The references section has been updated to include this amendment request.

**CONCLUSION**

Based on the statements contained in the application, and the conditions listed above, 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. 9357, Revision No. 2,
on 9-13-2013.