



QSA GLOBAL

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28 September 2006

Ms. Jessica Glenny, Project Manager
Licensing Section
Spent Fuel Project Office
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
One White Flint
Rockville, MD 20852

RE: TAC No. L23952, Supplemental Information for Current Amendment
USA/9187/B(U)-96 for the Model 865 Transport Package

Dear Ms. Glenny:

The following is provided in response to your requests for additional information in our subsequent telephone conversations:

1. Drawing R86590 has been revised to show "-96" instead of "-85" on the label on sheet 2. See the enclosed drawing R86590 Rev G. This will replace the drawings previously submitted as Section 1.4 of the SAR.
2. Section 1.1 and 7 have been modified to clarify the specific reference text for the IAEA TS-R-1 references used throughout the SAR. Enclosed are revisions to pages 1-1 and 7-1 of the SAR showing these changes.
3. Section 7.4.2 has been modified to reflect the 2004 version of the Emergency Response Guide instead of the 2000 version previously referenced. Enclosed is a revision to page 7-6 of the SAR showing this change.
4. Sections 7.1.1.2 and 7.1.2.1.c have been revised to clarify the inspection/maintenance and assembly steps involved after source loading of the Model 865. Enclosed are pages 7-1 through 7-6 of the SAR showing these changes and reflecting the associated change in pagination.

NMSSO I

Enclosed are pages 1-1 and 7-1 through 7-6 of Revision 10 to the SAR including drawing R86590 Rev G which replaces the drawings previously provided for Section 1.4 of the SAR. Changes to the text of Revision 9 of the SAR addressing items discussed in this letter are indicated by vertical lines in the right hand margin. Should you have any additional questions or wish to discuss this submission, please contact me as shown below.

Sincerely,

A handwritten signature in black ink, appearing to read "Lori Podolak", written in a cursive style.

Lori Podolak
Product Licensing Specialist
Regulatory Affairs Department

Enclosures:

- SAR Revision 10 pages 1-1, 7-1 through 7-6, and Section 1.4 drawing R86590 Rev G
- List of Affected Pages

Safety Analysis Report for the Model 865 Transport Package

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Safety Analysis Report for the Model 865 Transport Package

QSA Global Inc.
Burlington, Massachusetts

20 September 2006 - Revision 10
Page 1-1

Section 1 - GENERAL INFORMATION

1.1 Introduction

The Model 865 is designed as industrial radiography device and transport package for Type B quantities of special form radioactive material. It conforms to the Type B(U)-96 criteria for packaging in accordance 10 CFR 71, 49 CFR 173, and IAEA Regulations for the Safe Transport of Radioactive Material 1996 Edition (Revised) No. TS-R-1 (ST-1, Revised).

1.2 Package Description

(Reference:

- 10 CFR 71.33
- IAEA TS-R-1, paragraph 220 & 807)

The Model 865 package is constructed in accordance with the drawings included in Section 1.4. The package measures approximately 12 ¼ inches (311 mm) long by 7 5/8 inches (194 mm) in diameter. The general package information is shown in Table 1.2a:

Table 1.2a: Model 865 Package Information

Identification	Nuclide	Form	Maximum Capacity ¹	Chemical/ Physical Form	Maximum Content Weight	Maximum Decay Heat ³	Maximum DU Weight	Maximum Package Weight
865	Ir-192	Special Form ² Sources	240 Ci	Metal	< 1 gram	4.8 Watts	42 lbs (19 kg)	60 lbs (27 kg)

¹ Maximum Activity for Ir-192 is defined as output Curies as required in ANSI N432 and 10 CFR 34.20 and in line with TS-R-1 and Rulemaking by the USNRC and the USDOT published in the Federal Register on 26 January 2004.

² Special Form is defined in 10 CFR 71, 49 CFR 173, and IAEA TS-R-1.

³ Maximum decay heat for Ir-192 is calculated by correcting the output activity to content activity. A factor of 2.3 is used for Ir-192 to account for source capsule and self-absorption in this conversion.

1.2.1 Packaging

Except for the shield assembly, fill foam and some components of the lock assembly, all materials of construction are stainless steels. The major components of the package consist of the following:

- Tungsten source rod and stainless steel source capsule holder
- Stainless steel projector weldment
- Depleted Uranium shield
- Locking assembly
- Actuator Guard and Shipping Cover
- Stainless steel tubular handle
- Folded stainless steel feet

The package consists of a stainless steel cylindrical housing (projector weldment) which contains

FIGURE WITHHELD UNDER 10 CFR 2.390

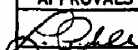

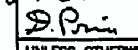
APPROVALS		DATE	PART NAME	QTY.	MATERIAL	DESCRIPTION
		28 Sep 06	 40 NORTH AVE, BURLINGTON, MA 01803			DESCRIPTIVE DRAWING
		28 Sep 06				
UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES TOLERANCES: FRACTIONS $\pm 1/8$ X.X ± 0.12 X.XX ± 0.08 X.XXX ± 0.020			TITLE			MODEL 865 TYPE B PROJECTOR DESCRIPTIVE ASSEMBLY
SIZE	DWG. NO.		REV			
B	R86590		G			
SCALE: NONE		SHEET 1 OF 8				

FIGURE WITHHELD UNDER 10 CFR 2.390


		QSA GLOBAL		DESCRIPTIVE DRAWING	
40 NORTH AVE, BURLINGTON, MA 01803					
TITLE MODEL 865 TYPE B PROJECTOR DESCRIPTIVE ASSEMBLY					
SIZE	DWG. NO.		R86590		REV
B	SCALE: NONE		SHEET 2 OF 8		G

FIGURE WITHHELD UNDER 10 CFR 2.390


		QSA GLOBAL		DESCRIPTIVE DRAWING	
40 NORTH AVE, BURLINGTON, MA 01803					
TITLE MODEL 865 TYPE B PROJECTOR DESCRIPTIVE ASSEMBLY					
SIZE	DWG. NO.		R86590		REV
B	SCALE: NONE		SHEET 3 OF 8		G

FIGURE WITHHELD UNDER 10 CFR 2.390


 QSA GLOBAL		DESCRIPTIVE DRAWING	
40 NORTH AVE., BURLINGTON, MA 01803			
TITLE MODEL 865 TYPE B PROJECTOR DESCRIPTIVE ASSEMBLY			
SIZE B	DWG. NO. R86590	REV G	
SCALE: NONE		SHEET 4 OF 8	

FIGURE WITHHELD UNDER 10 CFR 2.390


		QSA GLOBAL		DESCRIPTIVE DRAWING	
40 NORTH AVE, BURLINGTON, MA 01803					
TITLE MODEL 865 TYPE B PROJECTOR DESCRIPTIVE ASSEMBLY					
SIZE	DWG. NO.		R86590		REV
B	SCALE: NONE		SHEET 5 OF 8		G

FIGURE WITHHELD UNDER 10 CFR 2.390


		QSA GLOBAL		DESCRIPTIVE DRAWING	
40 NORTH AVE., BURLINGTON, MA 01803					
TITLE MODEL 865 TYPE B PROJECTOR DESCRIPTIVE ASSEMBLY					
SIZE	DWG. NO.		REV		
B	R86590		G		
SCALE: NONE		SHEET 6 OF 8			

FIGURE WITHHELD UNDER 10 CFR 2.390



		QSA GLOBAL		DESCRIPTIVE DRAWING	
40 NORTH AVE., BURLINGTON, MA 01803					
TITLE MODEL 865 TYPE B PROJECTOR DESCRIPTIVE ASSEMBLY					
SIZE	DWG. NO.		R86590		REV
B	SCALE: NONE		SHEET 7 OF 8		G

FIGURE WITHHELD UNDER 10 CFR 2.390

		QSA GLOBAL		DESCRIPTIVE DRAWING	
40 NORTH AVE, BURLINGTON, MA 01803					
TITLE MODEL 865 TYPE B PROJECTOR DESCRIPTIVE ASSEMBLY					
SIZE	DWG. NO.			REV	
B	R86590			G	
SCALE: NONE		SHEET 8 OF 8			

Safety Analysis Report for the Model 865 Transport Package

QSA Global Inc.
Burlington, Massachusetts

20 September 2006 - Revision 10
Page 7-1

Section 7 – Package Operations

Operation of the Model 865 transport package must be in accordance with the operating instructions supplied with the transport package, per 10 CFR 71.87 and 71.89. References to IAEA conform to the Type B(U)-96 criteria for packaging in accordance IAEA Regulations for the Safe Transport of Radioactive Material 1996 Edition (Revised) No. TS-R-1 (ST-1, Revised).

(Reference:

- USNRC, 10 CFR 71.87 and 71.89
- IAEA TS-R-1, paragraph 501(a), 502(e) and 503)

7.1 Package Loading

7.1.1 Preparation for Loading

The Model 865 package must be loaded and closed in accordance with the following written procedures. Shipment of Type B quantities of radioactive material are authorized for sources specified in Section 7.1.1.1. Maintenance and inspection of the Model 865 packaging is in accordance with the requirements specified in Section 7.1.1.2.

7.1.1.1 Authorized Package Contents

(Reference:

- USNRC, 10 CFR 71.87(a)
- IAEA TS-R-1, paragraph 502(f))

Table 7.1a: Model 865 Package Information

Nuclide	Form	Maximum Capacity ¹	Maximum DU Weight	Maximum Weight
Ir-192	Special Form Sources	240 Ci	42 lbs (19 kg)	60 lbs (27 kg)

¹Maximum Activity for Ir-192 is defined as output Curies as required in ANSI N432 and 10 CFR 34.20 and in line with TS-R-1, USNRC 10 CFR 71 and USDOT 49 CFR 173.

7.1.1.2 Packaging Maintenance and Inspection Prior to Loading

- 7.1.1.2.a Ensure all markings are legible and labels are securely fastened to the container.
- 7.1.1.2.b Inspect the container for signs of significant degradation. Ensure that the housing integrity is secure and does not have any significant dents, cracks of any type or rust.
- 7.1.1.2.c Ensure all bolts and hardware are present.

Safety Analysis Report for the Model 865 Transport Package

QSA Global Inc.
Burlington, Massachusetts

20 September 2006 - Revision 10
Page 7-2

- 7.1.1.2.d If the container fails any of the inspections in steps 7.1.1.2.a-c, remove the container from use until it can be brought into compliance with the Type B certificate.

7.1.2 Loading of Contents

NOTE: *These loading operations apply to "dry" loading only. The Model 865 package is NOT approved for wet loading.*

7.1.2.1 Prior to transportation, ensure the package and its contents meet the following requirements:

- 7.1.2.1.a The contents are authorized for use in the package.
- 7.1.2.1.b The package condition has been inspected in accordance with Section 7.1.1.2.
- 7.1.2.1.c Ensure that the source is secured into place in the storage position in accordance with the following requirements. Compliance with the following requirements ensures that the source is securely locked in position before shipment.
1. Removal and installation of radioactive material contained within the shield container must be performed in a shielded cell/enclosure capable of holding the maximum isotope capacity of the container. Container loading can only be performed by persons specifically authorized under an NRC or Agreement State license (or as otherwise authorized by an International Regulatory Authority). All necessary safety precautions and regulations must be observed to ensure safe transfer of the radioactive material. Source removal or loading should not be attempted by general users of this package and it is recommended that the device be returned to QSA Global Inc. for source loading or unloading.
 2. Remove the shipping cover. Unlock the actuator assembly. Remove the four bolts which secure the actuator assembly to the container body.
 3. Using remote handling techniques, remove the actuator assembly from the container body. Load the source assembly so that it is fully inserted into the source rod assembly as shown on drawing R86590. Once the source rod is loaded, install the source rod into the container and secure the actuator assembly to the container body using the four bolts (reference R86590).

Safety Analysis Report for the Model 865 Transport Package

QSA Global Inc.
Burlington, Massachusetts

20 September 2006 - Revision 10
Page 7-3

4. Ensure all bolts are present and secured. Assure safety wires are present and intact as noted on the drawings referenced in the Type B certificate.
5. Check that the source position indicator rod is in the down position and the key operated lock is engaged and the key removed, assuring that the source is locked in place in its proper shielded storage position.
6. Install the shipping cover using eight M6x1x12 mm long bolts. These bolts should be hand tightened in accordance with the specifications listed on drawing R86590. Attach a tamper indicating seal with an identification mark to two of these bolts.

7.1.3 Preparation for Transport

(Reference:

- 10 CFR 71.87
- IAEA TS-R-1, *applicable paragraphs of Section V*)

- 7.1.3.1 Ensure that all conditions of the certificate of compliance are met.
- 7.1.3.2 Perform a contamination wipe of the outside surface of the package and ensure removable contamination does not exceed the limit specified in 49 CFR 173.443.
- 7.1.3.3 Survey all exterior surfaces of the package to assure that the radiation level does not exceed 200 mR/hr at the surface. Measure the radiation level at one meter from all exterior surfaces to assure that the radiation level is less than 10 mR/hr.
- 7.1.3.4 Ship the container according to the procedure for transporting radioactive material as established in 49 CFR 171-178.

NOTE: The US Department of Transportation, in 49 CFR 173.22(c), requires each shipper of Type B quantities of radioactive material to provide prior notification to the consignee of the dates of shipment and expected arrival.

7.2 Package Unloading

7.2.1 Receipt of Package from Carrier

7.2.1.1 The consignee of a transport package of radioactive material must make arrangements to receive the transport package when it is delivered. If the transport package is to be picked up at the carrier's terminal, 10 CFR 20.1906 requires that this be done expeditiously upon notification of its arrival.

Safety Analysis Report for the Model 865 Transport Package

QSA Global Inc.
Burlington, Massachusetts

20 September 2006 - Revision 10
Page 7-4

7.2.1.2 Upon receipt of a transport package of radioactive material:

(Reference:

- *IAEA TS-R-1, paragraph 510 and 511)*

- | | |
|-----------|---|
| 7.2.1.2.a | Survey the transport package in accordance with the requirements of 10 CFR 20.1906. |
| 7.2.1.2.b | Record the actual radiation levels on the receiving report. |
| 7.2.1.2.c | If the radiation levels exceed the limits specified in 10 CFR 71.47, secure the container in a Restricted Area and notify the appropriate personnel in accordance with 10 CFR 20 or applicable Agreement State regulations. |
| 7.2.1.2.d | Inspect the overpack if it is used and the Model 865 package for physical damage or leaking. If the Model 865 package is damaged or leaking or any part of the package (including overpack) is suspected to have leaked or been damaged, restrict access to the package. As soon as possible, contact the Radiation Safety Office to perform a full assessment of the package condition and take necessary follow-up actions. |
| 7.2.1.2.e | Visually inspect the Model 865 to assure that the seal wire has not been tampered with. |
| 7.2.1.2.f | Record the radioisotope, activity, model number, and serial number of the source and the transport package model number and serial number. |

7.2.2 Removal of Contents

- 7.2.2.1 Arrange for unloading of the package in accordance with the information on drawing R86590 and the instructions supplied with the package per 10 CFR 71.89.

NOTE: Removal and installation of radioactive material contained within the shield container must be performed in a shielded cell/enclosure capable of holding the maximum isotope capacity of the container. Container loading can only be performed by persons specifically authorized under an NRC or Agreement State license (or as otherwise authorized by an International Regulatory Authority). All necessary safety precautions and regulations must be observed to ensure safe transfer of the radioactive material.

Source removal or loading should not be attempted by general users of this package and it is recommended that the device be returned to QSA Global Inc. for source loading or unloading.

Safety Analysis Report for the Model 865 Transport Package

QSA Global Inc.
Burlington, Massachusetts

20 September 2006 - Revision 10
Page 7-5

7.2.2.2 Unloading of the package must also be in accordance with applicable licensing provisions for the user's facility related to radioactive material handling.

7.3 Preparation of Empty Package for Transport

(Reference:

- IAEA TS-R-1, paragraph 520)

In the following instructions, an *empty* transport package refers to a Model 865 transport package without an active source contained within the shielded container. A device returned to the user as "empty" will have been visually confirmed at QSA Global Inc. (or other specifically licensed user) that the radioactive source has been removed and the container is confirmed empty. To ship an empty transport package:

7.3.1. To ship an empty package perform a radioactive contamination wipe test of the outer shipping package. This consists of rubbing filter paper or absorbent material, using heavy finger pressure, over an area of 300 cm² (46.5 in²) of the package surface. The activity on the filter paper should not exceed 0.00001 uCi/cm² of removable contamination.

NOTE: If the device is to be shipped without an overpack, the radioactive contamination wipe should be made of the outer surfaces of the device. If the device will be shipped inside of an overpack, the radioactive contamination wipe test should be made of both the outer surfaces of the device and the overpack with the device packaged for shipment inside the overpack.

7.3.2 After the survey prepare the package depending upon the radiation levels obtained as prescribed in 49 CFR 173.

7.3.3 Ship the container according to the procedure for transporting radioactive material as established in 49 CFR 171-178.

7.4 Other Operations

7.4.1 Package Transportation By Consignor

(Reference:

- IAEA TS-R-1, paragraph 508, 512 through 514)

Persons transporting the Model 865 transport package in their own conveyances should comply with the following:

7.4.1.1 For a conveyance and equipment used regularly for radioactive material transport, check to determine the level of contamination that may be present on these items. This contamination check is suggested if the package shows signs of damage upon receipt or during transport, or if a leak test on the special form source transported in the package exceeds the allowable limit of 185 Bq.

Safety Analysis Report for the Model 865 Transport Package

QSA Global Inc.
Burlington, Massachusetts

20 September 2006 - Revision 10
Page 7-6

7.4.1.2 If contamination above 4 Bq/cm^2 (when averaged over 300 cm^2) is detected on any part of a conveyance or equipment used regularly for radioactive material transport, or if a radiation level exceeding $5 \text{ } \mu\text{Sv/h}$ is detected on any conveyance or equipment surface, then remove the affected item from use until decontaminated or decayed to meet these limits.

7.4.2 Emergency Response

(Reference:

- *IAEA TS-R-1, paragraph 308 and 309)*

In the event of a transport emergency or accident involving this package, follow the guidance contained in "2004 Emergency Response Guidebook: A Guidebook for First Responders During the Initial Phase of a Dangerous Goods/Hazardous Materials Incident", or equivalent guidance documentation.

Reference: "2004 Emergency Response Guidebook: A Guidebook for First Responders During the Initial Phase of a Dangerous Goods/Hazardous Materials Incident"

7.5 Appendix

Not Applicable.