



QSA GLOBAL

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9 February 2009

Mr. Pierre Saverot
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Docket No.: 71-9187 & TAC No.s L24229 & L24230

Subject: RAI Response for Model 865 Type B Container

Dear Mr. Saverot:

The following is provided in response to Mr. Luis Cruz-Perez's letter dated 7 November 2008 regarding the 865 Type B container.

1-1 Drawing R86590 Rev J enclosed references nationally recognized industry standards for safety related components. The level of detail in material composition for drawing components with minimal or no importance to safety on Drawing R86590 is generic.

1-2 The term "or equivalent" has been removed from drawing R86590 sheet 1, note 2 in Revision J (see Appendix A).

1-3 As discussed during our site visit on 3 December 2008, the best method for identifying shielding porosity is an adequate radiation survey. Specifying a minimum shield weight is not a reliable or adequate means for identification of a defective shield due to porosity.

The description of the radiation surveys referenced in Section 8 of the SAR has been improved to add more detail regarding the radiation profiles performed for the Model 865 devices prior to their distribution as radiography devices.

1-4 Revision 11 to the 865 SAR has been revised to include inspection of the projector cover hardware for signs of fatigue cracking. The hardware associated with the 865 actuator and lock mechanisms will be inspected at the time of source changing/replacement as this device requires the use of a shielded cell and specially designed tools to access and remove the sealed source and should not be performed by general uses of the device/transport package. While empty, annual servicing and inspection of the package hardware is performed on the Model 865 device.

This change is incorporated under section 7.1.1.2.c. Pages 7-1 through 7-6 of Revision 11 to the SAR is included with this letter.

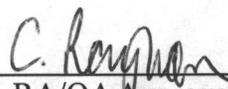
E-1 Page 3-2 of the SAR Revision 11 is enclosed and adds the requested note regarding thermal expansion to Table 3.2a.

Should you have any questions prior to the submission of our response, please feel free to contact me.

Sincerely,



Lori Podolak
Senior Regulatory Affairs Specialist
Regulatory Affairs Department
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Email: Lori.Podolak@qsa-global.com

 RA/QA Approval	_____ Date
 Engineering Approval	9 Feb 09 Date

Enclosures:

- A- R86590 Rev J and Table of Drawing Changes
- B- SAR Revision 11 pages 3-2, 7-1 thru 7-6, 8-2 thru 8-4 and List of affected pages

Enclosure A – Drawing R86590 Rev J with Table of Drawing changes

Summary Table of Changes to Drawing R86590 Rev H to Rev J

Note: The level of detail in material composition for drawing components with minimal or no importance to safety on Drawing R86590 Rev J are generic.

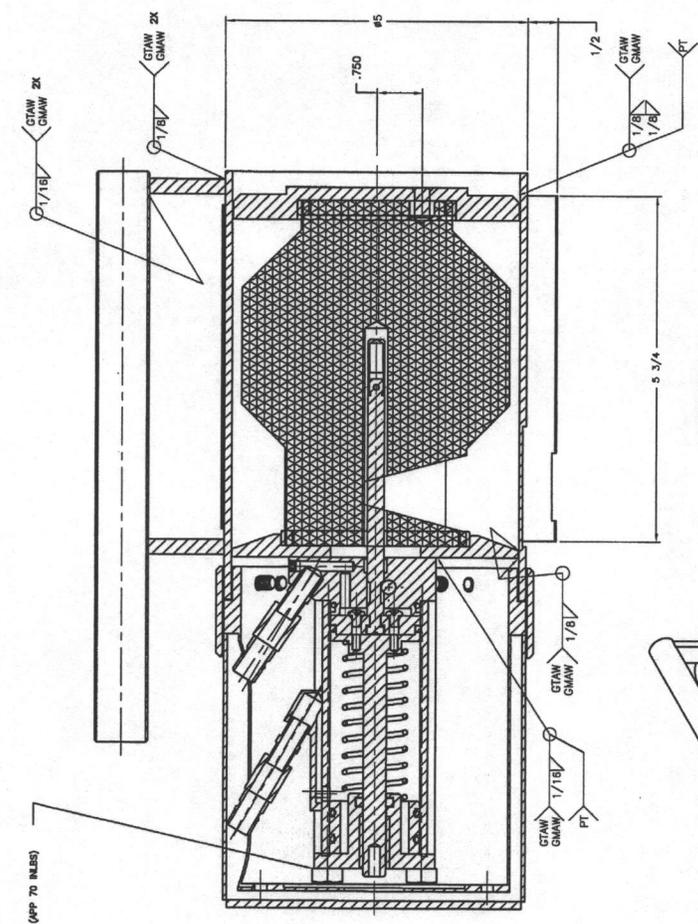
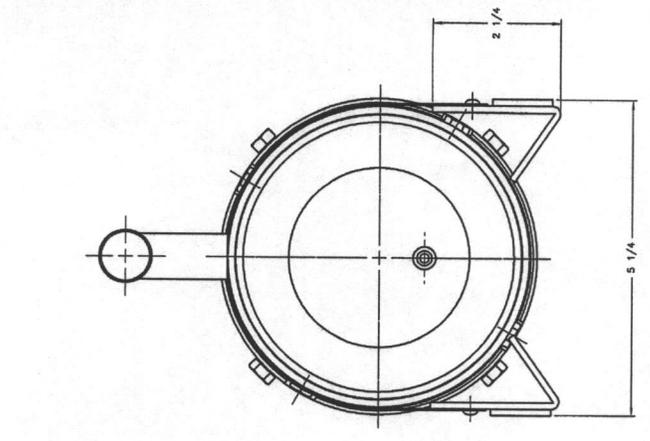
Change Location R86590 Rev J	Summary Change	Change Reported Pursuant to 71.95	Impact of Change on Units Previously or Currently in Use under the Certificate	Action Taken By QSA Regarding Affected Units
Sheet 1	Note 2 is revised to remove the words "or equivalent requirements" in reference to inspectors qualified to ASNT SNT-TC-1A.	No	No change to package construction or design. Detail added for completeness and clarity only.	None. Not applicable.
Sheet 1	BOM entry added for seal wire.	No	No change to package construction or design. Detail added for completeness and clarity only. Seal wire serves as tamper indicator in accordance with 10 CFR 71.43(b) as evidence of possible unauthorized access to the contents should the seal become broken during transport. The item is not important to overall safety (NITS) of the transport package.	None. Not applicable.
Sheet 1	Material specification for pop rivets denoted as "NITS".	No	No change to package construction or design. Detail added for completeness and clarity only. The pop rivets are used to secure the name plate to the device and is not part of the primary containment. The item is not important to overall safety (NITS) of the transport package.	None. Not applicable.
Sheet 3	The part name is corrected from "Shield Collar Ring, Upper" to read "Shield Support Ring, Upper".	No	No change to package construction or design. Change made for accuracy.	None. Not applicable.
Sheet 4	Material designation for bolt changed from "stainless steel" to "austenitic stainless steel".	No	No change to package construction or design. Detail added for completeness and clarity only.	None. Not applicable.

Summary Table of Changes to Drawing R86590 Rev H to Rev J

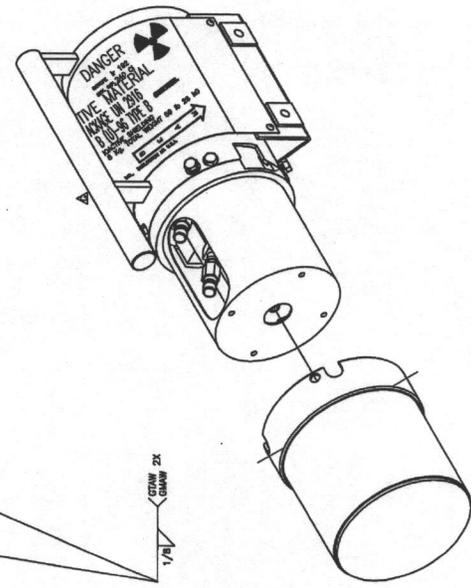
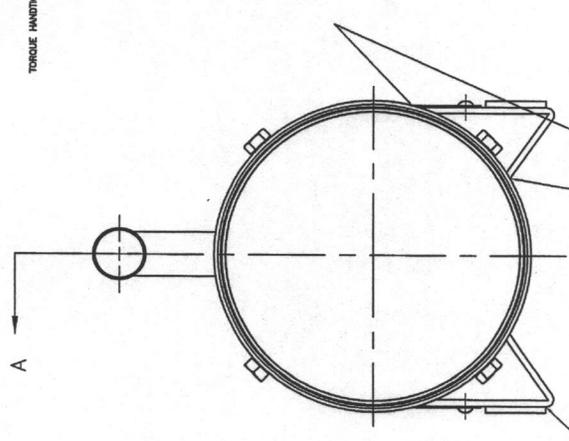
Change Location R86590 Rev J	Summary Change	Change Reported Pursuant to 71.95	Impact of Change on Units Previously or Currently in Use under the Certificate	Action Taken By QSA Regarding Affected Units
Sheet 4	Material specification for compression spring denoted as "NITS".	No	No change to package construction or design. Detail added for completeness and clarity only. The compression spring serves no purpose in maintaining the source in the locked position during transport (i.e., source is locked in place by the locking rod and lock). The compression springs serves a functional purpose during operation of the Model 865 as a radiography device, not in transport mode. The item is not important to overall safety (NITS) of the transport package.	None. Not applicable.
Sheet 4	Material specification for roll pin denoted as "NITS".	No	No change to package construction or design. Detail added for completeness and clarity only. The roll pin is redundant to the threaded connection between the source rod and the capsule holder. Failure of the roll pin during transport will have no impact on the security/integrity of the source during transport as the components are locked in the fully shielded position by the locking rod and lock during transport. The item is not important to overall safety (NITS) of the transport package.	None. Not applicable.
Sheet 4	Material designation for capsule holder is changed from "stainless steel" to "304 stainless steel".	No	No change to package construction or design. Detail added for completeness and clarity only.	None. Not applicable.
Sheet 4	Material designation for screw changed from "stainless steel" to "austenitic stainless steel".	No	No change to package construction or design. Detail added for completeness and clarity only.	None. Not applicable.

Summary Table of Changes to Drawing R86590 Rev H to Rev J

Change Location R86590 Rev J	Summary Change	Change Reported Pursuant to 71.95	Impact of Change on Units Previously or Currently in Use under the Certificate	Action Taken By QSA Regarding Affected Units
Sheet 4	Material specification for plug denoted as "NITS".	No	No change to package construction or design. Detail added for completeness and clarity only. The plug serves no purpose in containment of the source during transport. The plug only serves a functional purpose during operation of the Model 865 as a radiography device, not in transport mode. The item is not important to overall safety (NITS) of the transport package.	None. Not applicable.
Sheet 4	Material designation for socket head screw changed from "stainless steel" to "austenitic stainless steel".	No	No change to package construction or design. Detail added for completeness and clarity only.	None. Not applicable.
Sheet 4	Material specification for set screw denoted as "NITS".	No	No change to package construction or design. Detail added for completeness and clarity only. The set screw is used to secure the plug to the actuator base and serves no purpose in containment of the source during transport. The item is not important to overall safety (NITS) of the transport package.	None. Not applicable.



SECTION A-A



TORQUE HANDTIGHT (APP 70 IN.LBS)

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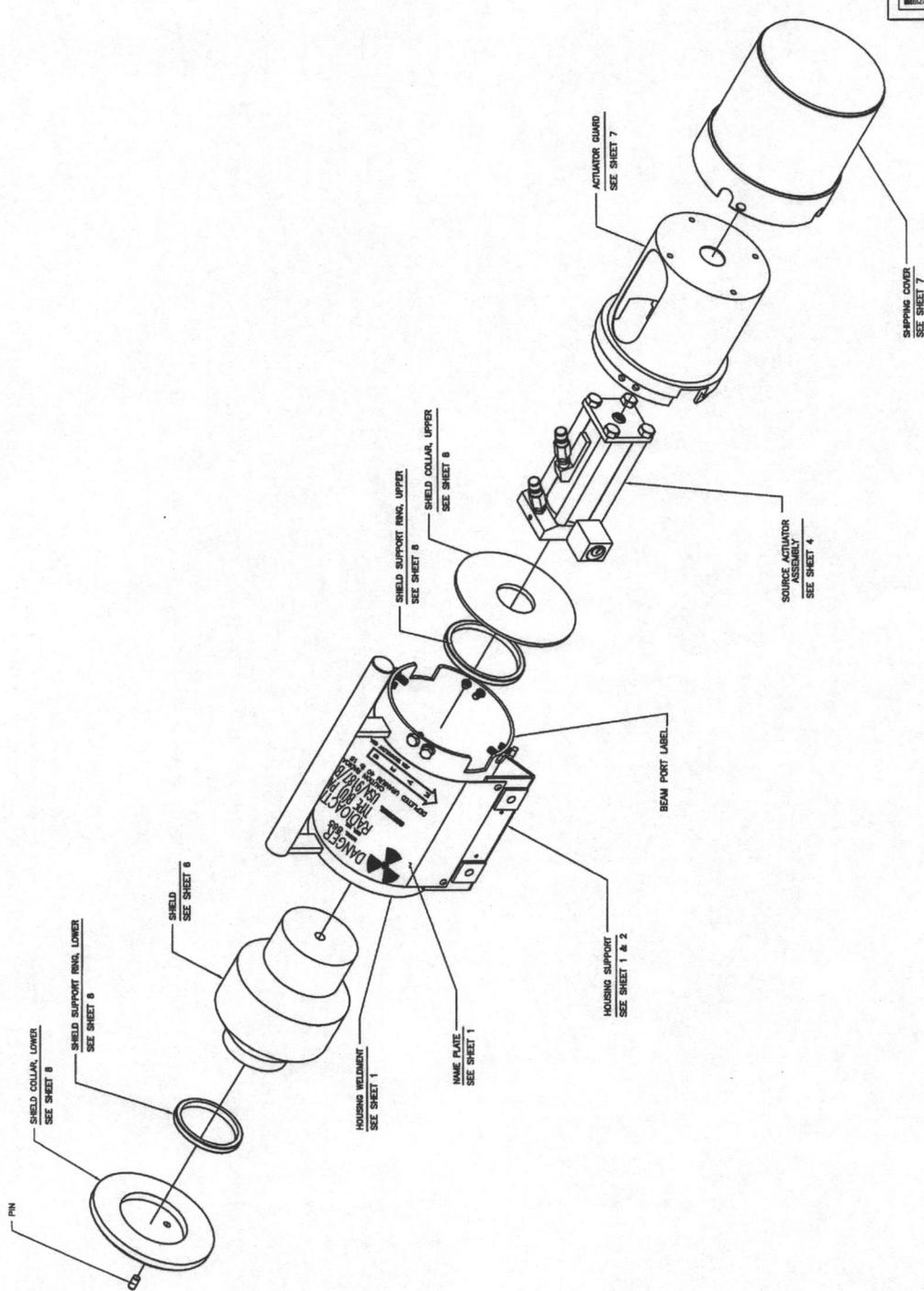
DESCRIPTIVE DRAWING

TITLE MODEL 865 TYPE B PROJECTOR
 DESCRIPTIVE ASSEMBLY

SIZE DWG. NO. R86590
 SCALE: NONE SHEET 2 OF 8

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS IN INCHES
 TOLERANCES:
 FRACTIONS ± 1/8
 X.X ± 0.12
 X.XX ± 0.06
 X.XXX ± 0.020

REV J



P/N	QTY.	MATERIAL	DESCRIPTION
SHIELD COLLAR, LOWER	1	SEE SHEET 8	SEE SHEET 8
SHIELD SUPPORT RING, LOWER	1	SEE SHEET 8	SEE SHEET 8
SHIELD	1	SEE SHEET 6	SEE SHEET 6
HOUSING WELDMENT	1	SEE SHEET 1 & 2	SEE SHEET 1 & 2
NAME PLATE	1	SEE SHEET 1	SEE SHEET 1
HOUSING SUPPORT	2	SEE SHEET 1 & 2	SEE SHEET 1 & 2
BEAM PORT LABEL	1	ALUMINUM FOLIE WITH ADHESIVE BACK	1 1/2" X 1 3/4" DECAL
SHIELD COLLAR, UPPER	1	SEE SHEET 8	SEE SHEET 8
SHIELD SUPPORT RING, UPPER	1	SEE SHEET 8	SEE SHEET 8
SOURCE ACTUATOR ASSEMBLY	1	SEE SHEET 4	SEE SHEET 4
ACTUATOR GUARD	1	SEE SHEET 7	SEE SHEET 7
SHIPPING COVER	1	SEE SHEET 7	SEE SHEET 7



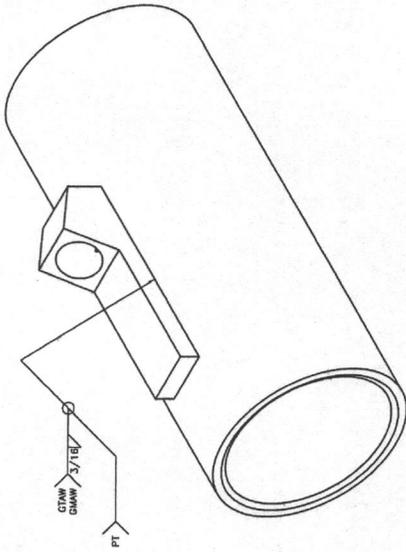
40 NORTH AVE., BURLINGTON, MA 01803

DESCRIPTIVE DRAWING

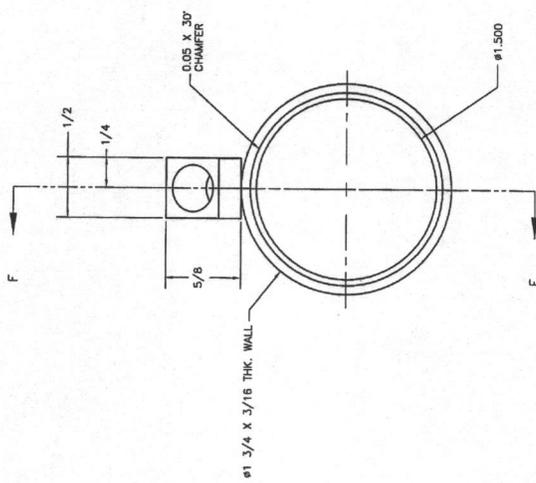
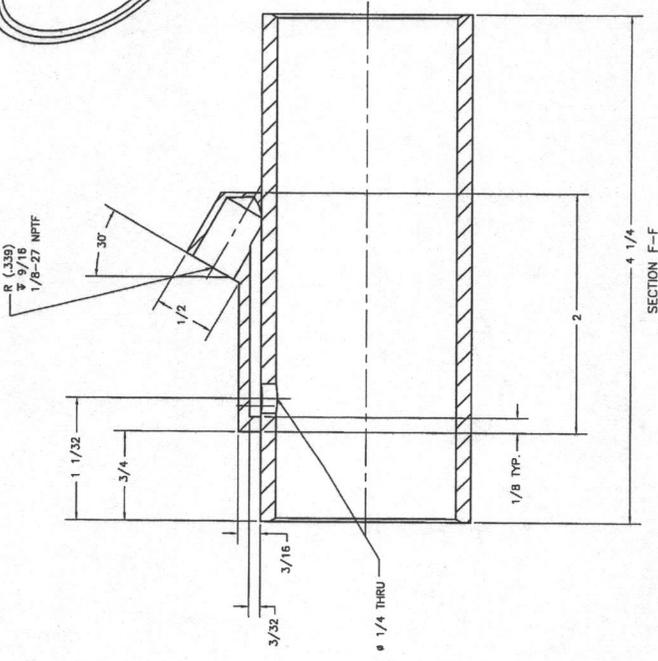
TITLE MODEL 865 TYPE B PROJECTOR DESCRIPTIVE ASSEMBLY

SIZE DWG. NO. R86590
 B SCALE: NONE SHEET 3 OF 8
 REV J

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS IN INCHES
 TOLERANCES:
 FRACTIONS ± 1/8
 .XX ± 0.016
 .XXX ± 0.020



CDW
DWW 3/16
PT



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DESCRIPTIVE DRAWING

TITLE MODEL 865 TYPE B PROJECTOR DESCRIPTIVE ASSEMBLY

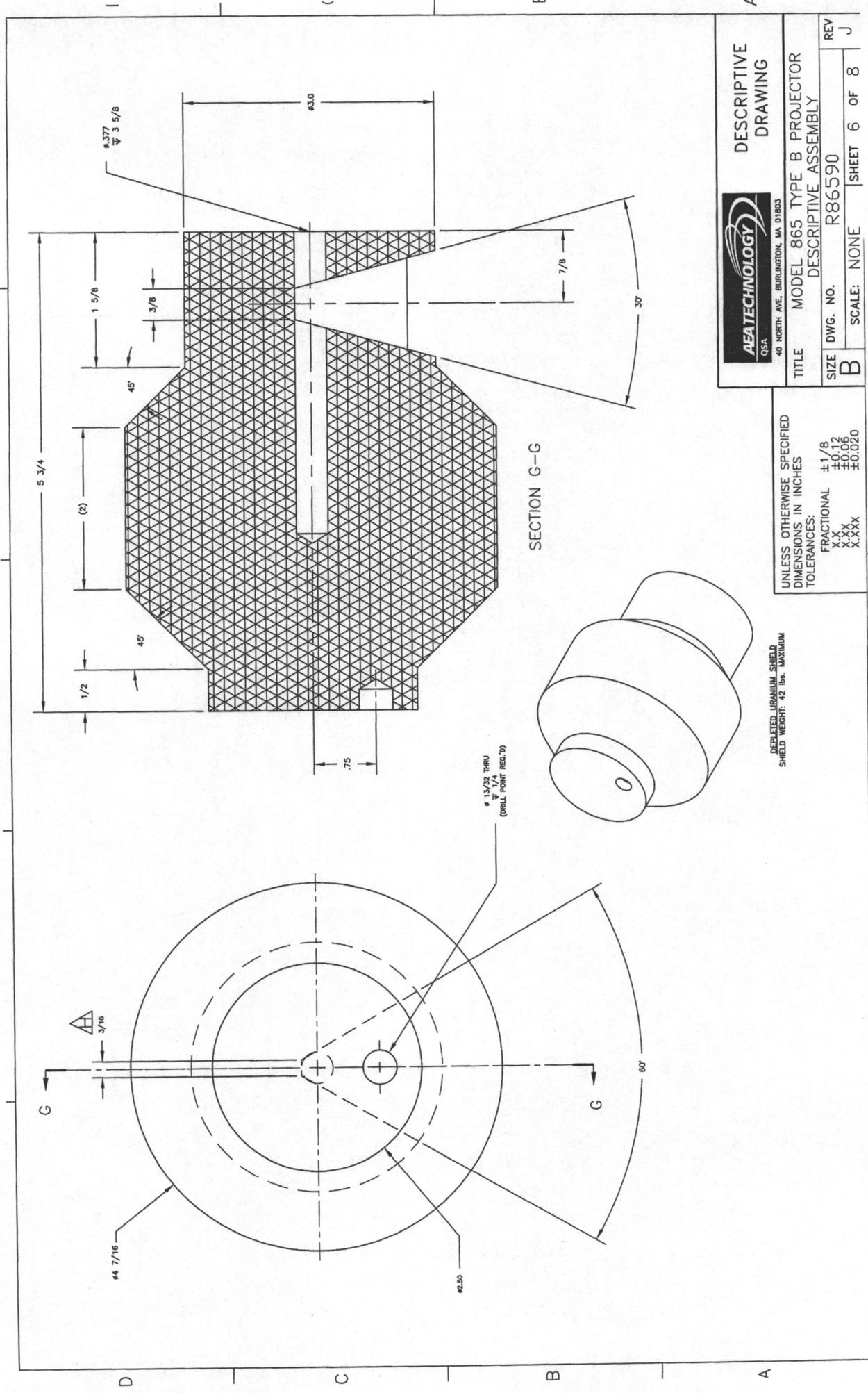
SIZE DWG. NO. R86590

SCALE: NONE SHEET 5 OF 8

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES TOLERANCES:

FRACTIONAL	±1/8
X.X	±0.12
X.XX	±0.06
X.XXX	±0.020

REV J



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DESCRIPTIVE DRAWING

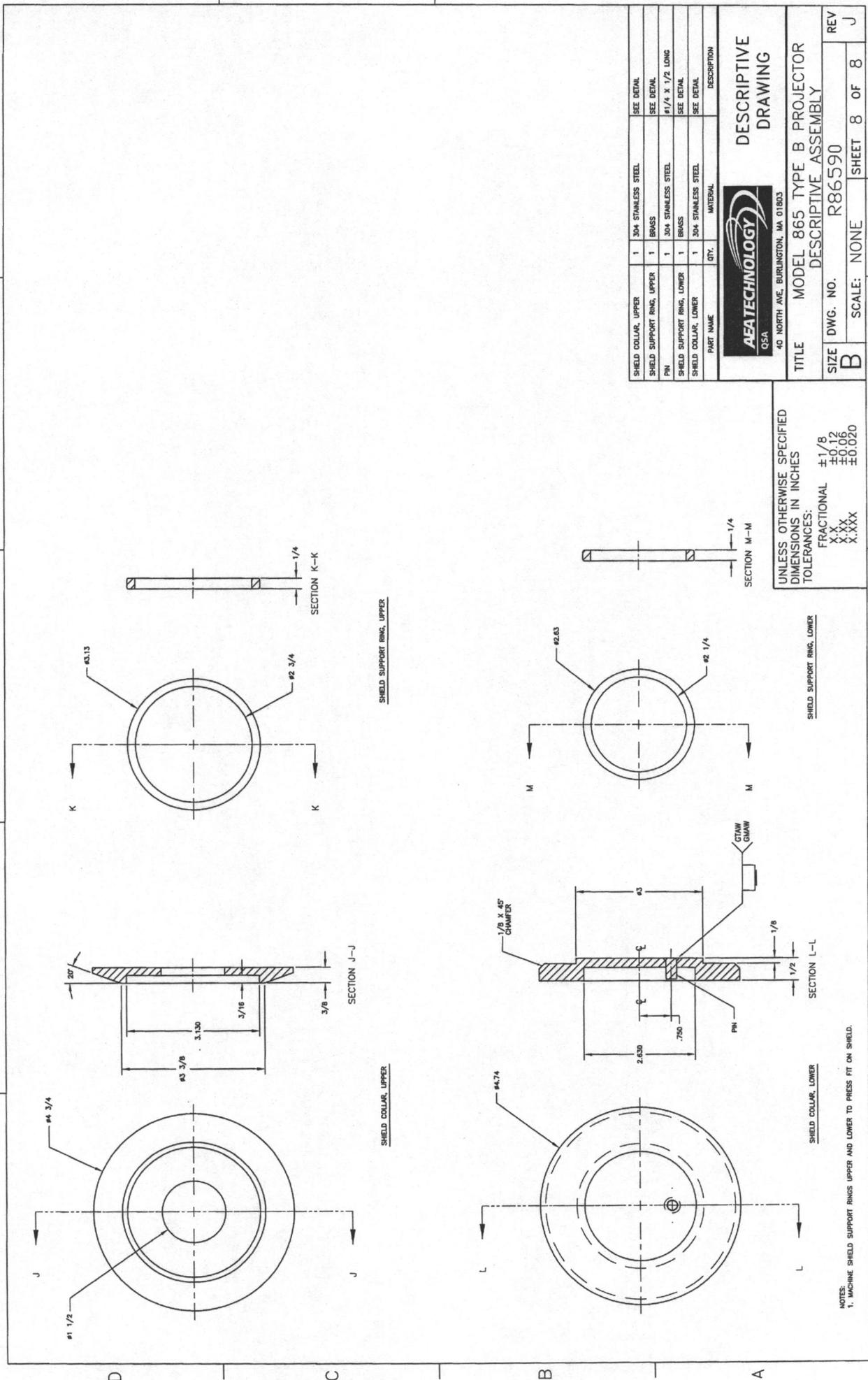
TITLE MODEL 865 TYPE B PROJECTOR DESCRIPTIVE ASSEMBLY

SIZE	DWG. NO.	REV
B	R86590	J
SCALE:	NONE	SHEET 6 OF 8

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES TOLERANCES:

FRACTIONAL	±1/8
X.X	±0.12
X.XX	±0.06
X.XXX	±0.020

DEPLETED URANIUM SHIELD SHIELD WEIGHT: 42 lbs. MAXIMUM



UNLESS OTHERWISE SPECIFIED
DIMENSIONS IN INCHES
TOLERANCES:
FRACTIONAL ±1/8
±0.12
X.X ±0.06
X.XX ±0.020
X.XXX

SHIELD COLLAR, UPPER	1	304 STAINLESS STEEL	SEE DETAIL
SHIELD SUPPORT RING, UPPER	1	BRASS	SEE DETAIL
PN	1	304 STAINLESS STEEL	#1/4 X 1/2 LONG
SHIELD SUPPORT RING, LOWER	1	BRASS	SEE DETAIL
SHIELD COLLAR, LOWER	1	304 STAINLESS STEEL	SEE DETAIL
PART NAME	QTY.	MATERIAL	DESCRIPTION

AEATECHNOLOGY
QSA
40 NORTH AVE., BURLINGTON, MA 01803

DESCRIPTIVE DRAWING

TITLE MODEL 865 TYPE B PROJECTOR
DESCRIPTIVE ASSEMBLY

SIZE DWG. NO. R86590

SCALE: NONE

SHEET 8 OF 8

REV J

NOTES:
1. MACHINE SHIELD SUPPORT RINGS UPPER AND LOWER TO PRESS FIT ON SHIELD.

Enclosure B – SAR Revision 3 pages 3-2, 7-1 thru 7-6 & 8-2 thru 8-4

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Table 3.1b: Summary Table of Maximum Pressures

Package Configuration	Void Volume IN ³	Normal Conditions 99.5°C (211°F) Pressure Developed	Fire Conditions 800°C (1,472°F) Pressure Developed	Comments
865	0	0 psig	0 psig	

3.2 Material Properties and Component Specifications

3.2.1 Material Properties

Table 3.2a lists the relevant thermal properties of the important materials in the transport package. The sources referred to in the last column are listed below the table.

Table 3.2a: Thermal Properties of Principal Transport Package Materials

Material	Density (g/cm ³)	Melting/Combustion Temperature	Linear Expansion (µm/mK)	Source
Depleted Uranium	18.6	1,135°C (2,075°F)	12	Reference #1
Brass	8.3 – 8.75	900-1,025°C (1,652-1,877°F)	18.7 – 21.2	Reference #1
Stainless Steel- Type 304 Type 303	7.9	1,400-1,450°C (2,552-2,642°F)	17	Reference #1
Tungsten	19.3	3,410°C (6,170°F)	4.6	Reference #2
Bronze	7.7 – 8.89	980-1,050°C (1,796-1,922°F)	16.4 – 21.2	Reference #1

NOTE: The thermal expansion of the materials in this table are temperature dependent. Operating temperature range of nitrile rubber 'O' rings is -40°F to +125°F.

Resource references:

1. Metals Handbook. American Society for Metals, 8th Edition.
2. Metals Handbook Desk Edition. American Society for Metals

3.2.2 Component Specifications

All components are specified and described on the drawings included in the Section 1.4.

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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 and there is no visible signs of damage to hardware heads. After removal of the cover, examine the external surfaces of the cover bolts for any signs of fatigue cracking.

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Note: A visual examination of the actuator guard bolts and the source actuator assembly bolts for thread condition is performed by QSA Global, Inc. at the time of source changing/replacement as this device requires the use of a shielded cell and specially designed tools to access and remove the sealed source. Removal of this hardware should not be performed by general users of the device/transport package. While empty, annual servicing and inspection of the package hardware is performed on the Model 865 device by QSA Global, Inc.

The bolts/fasteners must be replaced prior to further transport, if they are no longer fit for use (e.g., threads stripped, unable to fully thread, signs of cracking, etc).

- 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.

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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).
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.

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

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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.

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:

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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.

7.4.1.2 If contamination above 4 Bq/cm² (when averaged over 300 cm²) is detected on any part of a conveyance or equipment used regularly for radioactive material transport, or if a radiation level exceeding 5 μSv/h is detected on any conveyance or equipment surface, then remove the affected item from use until decontaminated or decayed to meets 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.

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The containment system is not designed to require increased or decreased operating pressures to maintain containment during transport, therefore pressure tests of package components prior to first use is not required.

8.1.4 Leakage Tests

The source capsule (primary containment) is wipe tested for leakage of radioactive contamination upon initial manufacture. The removable contamination must be less than 0.005 microcuries. The source capsule will also be subjected to leak tests under ISO9978:1992(E) (or more recent editions). The source capsule is not used if it fails any of these tests.

8.1.5 Component and Material Tests

The lock assembly of the package is tested to assure that the security of the source will be maintained. Failure of this test will prevent use of the package until the cause of the failure is corrected. Component and material compliance is achieved in accordance with the requirements in QSA Global Inc.'s USNRC approved Quality Assurance Program No. 0040.

8.1.6 Shielding Tests

The radiation levels at the surface of the transport package and at 1 meter from the surface are evaluated prior to first transport. This survey, performed in a low background area involved a slow scan survey of the entire surface area as well as one meter from the surface of the 865 device. This survey was used to identify any significant void volumes or shield porosity which could prevent the finished Type B(U) transport package, from complying with the dose limits in 10 CFR 71.47.

The radiation profile survey is made with the radiation detector housing in contact with the surface of the device. The maximum radiation levels, when extrapolated to the rated capacity of the transport package, can not exceed 200 mR/hr at the surface, nor 10 mR/hr at 1 meter from the surface of the transport package. Since the Model 865 also functions as a radiography exposure device, the maximum allowed dose rate at one meter from the surface of the device is further limited to 2 mR/hr at the time of manufacture.

Failure of this radiation profile tests for any 865 device identifies the potential of significant shielding porosity which causes the rejection of the 865 device. Rejected 865 devices which do not comply with the construction requirements on drawing R86590 and the radiation profile requirements are not distributed and therefore prevented from use as a Type B(U) package.

8.1.7 Thermal Tests

Not applicable. The source content of the Model 865 package has minimal effect on the package surface temperature and therefore no additional testing is necessary to evaluate thermal properties of the packaging.

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8.1.8 Miscellaneous Tests

Not applicable.

8.2 Maintenance Program

8.2.1 Structural and Pressure Tests

Not applicable. Material certification, or equivalent dedication process, is obtained for Safety Class A components used in the transport package prior to their initial use. Based on the construction of the design, no additional structural testing during the life of the package is necessary if the container shows no signs of defect when prepared for shipment in accordance with the requirements of Section 7 of the SAR.

The 865 packaging system is not designed to require increased or decreased operating pressures to maintain containment during transport, therefore pressure tests of package components prior to individual shipment is not required.

8.2.2 Leakage Tests

As described in Section 8.1.4, "Leakage Tests," the radioactive source assembly is leak-tested at manufacture. In addition, the sources are leak tested in accordance with that Section at least once every six months thereafter if being transported to ensure that removable contamination is less than 0.005 microcuries. Also a contamination wipe is performed of the shield source tubes whenever the shield is returned to the manufacturer (typically the shield is shipped to a customer with new sources and may be returned directly to the manufacturer with decayed sources for disposition).

8.2.3 Component and Material Tests

The transport package is inspected for tightness of fasteners, proper seal wires, and general condition prior to each use as described in Section 7 of this SAR. No additional component or material testing is required prior to shipment.

8.2.4 Thermal Tests

Not applicable. The source content of the Model 865 package has minimal effect on the package surface temperature and therefore no additional testing is necessary to evaluate thermal properties of the packaging prior to shipment.

8.2.5 Miscellaneous Tests

It is recommended that inspection and maintenance of the Model 865 container and the Model 86550 control unit be performed at intervals not to exceed three months. This inspection and maintenance includes the following:

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- 8.2.5.1 Check the operation of the survey meter and check to assure that the source is properly stored by measuring the radiation intensity at the surface of the container and at one meter from the surface. The radiation level should not exceed 200 mR/hr at the surface nor 10 mR/hr at one meter from the surface.
- 8.2.5.2 Inspect the container for any signs of damage or excessive wear. Check to assure that there are no loose fasteners or broken safety wires. Assure that the container is properly labeled.
- 8.2.5.3 Inspect all welds for signs of corrosion and/or cracks.
- 8.2.5.4 Ensure that all labels are securely attached and legible.
- 8.2.5.5 Inspect the condition of all bolts and screws. If there is any sign of strain present on the bolt or damage to the threads discard and replace.
- 8.2.5.6 Inspect the outer shell of the container for cracks, pitting and dents. The damaged component or assembly should be replaced. Denting of the outer shell is acceptable so long as the performance of the container is not affected and measured dose rates are within regulatory limits.
- 8.2.5.7 If the device is used in an environment that would be conducive to the creation of crevice corrosion (i.e. salt water splash zone, oil rig work, etc.), the device should be rinsed after use with clean water to remove any residue which could contribute to corrosion.
- 8.2.5.8 If the device is routinely used for underwater radiography, then the projector should be tested by a non-destructive examination (NDE) technique such as dye penetrant at source changes. The NDE should be performed on all external shield container surfaces, particularly under the label. Evidence of pitting, cracking or corrosion indicate the need for repair or scrapping of the component or assembly.
- 8.2.5.9 In addition, the radioactive source should be wipe tested for leakage of radioactive contamination every six months.
- 8.2.5.10 Prior to each use, a radiation survey of the package should be made to assure radiation levels do not exceed 200 mR/hr at the surface or 10 mR/hr at 3 ft from the surface of the package.

8.3 Appendix

Not applicable.