71-6613

QSA GLOBAL

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15 May 2008

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

RE: USA/6613/B(U)-96 (Current Revision 12)

Dear Director:

The following if provided in response to your request for additional information dated 28 April 08. This response includes a revision to drawing R70290 (Rev S enclosed with this letter) to address the issues noted in your letter.

1-1 Sheet 1 of Drawing R70290 has been revised to identify the applicable AWS code reference in the notes. This was further revised to clarify the qualification standard for the weld inspectors. The weld notations are formatted the in the same way as those previously approved for the Model 680-OP Type B transport container under CoC USA/9035/B(U)-96 Rev 21.

1-2 The weld specification for the skid foot pads has been corrected to more accurately describe the weld requirements for these items. Sheet 3 of Drawing R70290 has been revised and this component weld specification is now described as follows:

- ¼ Fillet weld on two interior sides of the foot pad.
- 1/8 Groove weld ground flat on the side of the foot pad along the straight edge of the skid.
- Flare-Bevel weld on the side of the foot pad along the bent edge of the skid.

1-3 Though we believe use of the 18-8 material will not reduce the safety of the Model 702 package, in an effort to expedite review and approval of this renewal request, we are abandoning our request to change the material for these bolts to 18-8 stainless steel. We will continue to require shipments of this package using the currently approved bolts which are 304 stainless steel.

1-4 The 304 stainless steel cask lid bolts have been assigned a safety classification of "A" based on evaluation of the component to the criteria in NUREG/CR-6407. This bolt was conservatively given a safety classification of "A" because it meets the general definition of "Lid Closure Hardware" under the NUREG document. However, the cover plug, with eyebolt attached, cannot be completed removed from the shielded body of the 702 inner cask with the 702 transport cage installed due to component interference. The eyebolt would hit the top of the cage and prevent the shielded cover plug from exposing the contents enough to result in an adverse safety condition. Since this would effectively require a failure of the cask lid bolts as well as a secondary component failure the bolts could be classified as safety class "B", however, we have decided to conservatively class these bolts as safety class "A" at this time.

NMSS01

1-5 Earlier designs of the 702 cask lid involved a spacer and the lid top as part of the assembly. Later these components were combined into a single piece construction to facilitate fabrication. The combined construction and the two piece construction are secured to the cover sheath by the same weld. Whether the lid is made as a single piece or whether the lid is used to hold in place a spacer beneath the weld joint will have no adverse impact on the lid integrity.

The two piece construction has been re-added as an alternate construction option on Sheet 8 of Rev S to drawing R70290. (The deletion of the reference to the two piece construction was unintentional and it has been re-instated on Rev S of drawing R70290). Structurally the one piece construction matches or exceeds the mechanical performance characteristics of the two piece construction.

1-6 When constructed as two pieces, the drill depth did not continue through to the spacer piece. This alternate construction is described as 5/16 Drill x ½ deep, 3/8-16 Bot Tap 7/16 DP on sheet 8 of Rev S to drawing R70290. When the lid is constructed from a single piece, the drill depth is deeper into the lid top piece and is described as 5/16 Drill Must not Break Thru, 3/8-16 x 7/8 Deep on Center. (The deletion of the reference to the two piece construction drill/tap configuration was unintentional and it has been re-instated on Rev S of drawing R70290). The variation in the drill depths described above will have no impact on the package ability to meet the normal or hypothetical accident condition transport requirements.

2-1 Sections 2.7.4.2 and 2.7.4.3 of the SAR have been revised as requested to delete the analytical analysis and replace this with reference to the finite element analysis. See Revision 8 to the SAR included with this letter.

2-2 Section 5.1.1 has been updated to reflect the mass of the depleted uranium in the 702 as 217 lb (98 kg) ± 7 lb (3.2 kg).

3-1 A qualifying remark regarding the temperature dependence of the materials thermal expansion has been added to Table 3.2.1.a as requested.

8-1 Sections 8.2.3 and 7.1.1 have been expanded to more clearly identify inspection of the bolts/hardware for signs of fatigue cracking and to require removal if the hardware is no longer fit for use.

Additional administrative updates have been made to the SAR. Revision 8 pages reference at the end of this letter are included and incorporate the following general updates changes related to formatting or other administrative changes:

- The company name has been updated from AEA Technology to QSA Global Inc. throughout the document.
- References to Appendices in Section 5 were corrected (Revision 7 did not identify the precursor sheet correctly to Appendix Section 5.5.2).
- Section 7.4.2 has been updated to reference the current revision of the Emergency Response Handbook (2004)

The timing of the NRC renewal certificate is critical in our ability to obtain the DOT competent authority (CoA) certification in time to ensure continued use of this container when shipping from Russia and ADR countries for the months of July and August. It will take at least 30 days to obtain revised Type B approvals in Russia and the UK for an extended ADR approval after we obtain the DOT CoA approval. Because of the timing of these certificate actions and to ensure uninterrupted transport of this package, we are in desperate need of obtaining the NRC renewal for this certificate no later than 30 May 2008. If we are unable to obtain an NRC CoC until the end of June, there will be a unavoidable gap of foreign transport approval coverage for this container. This will subsequently prevent Type B shipments currently scheduled and depended upon for the Model 702 during the months of July and August.

This gap in coverage would prevent receipt of Ir-192 required for the production of 375-450 individual radiography sources due to the inability to receive the 702 container from Russia and another 450 sources due to the loss of the ADR approval for the 702 container during this time period. Currently there is an Ir-192 supply crisis in that this material's production has become strained and the radiography community has forwarded their concerns to ourselves as well as staff at the NRC in attempts to improve the supply stability of Ir-192 to the radiography community. If we loose the foreign certificate approvals for 30-45 days, this will translate to a loss of ~900 sources to an industry that is currently in desperate need of Ir-192 sources to meet their production requirements for non-destructive testing.

Again it is critical that we obtain the renewal of the NRC CoC for the Model 702 package no later than 30 May 2008. This is necessary to prevent a significantly adverse impact on the Ir-192 supply for this summer which is the peak material demand for Ir-192 to support construction requirements of the radiography industry. We are willing to provide any and all additional information that might be necessary to your office in an expedited manner and we ask that any future requests for additional information as well as the renewed certificate be faxed and/or emailed to our offices at the contact numbers listed below.

Should you have any additional questions or wish to discuss this submission after receipt please contact me as soon as possible. If you feel a site visit with your staff would be beneficial and/or facilitate review of this submission, again please call me and we will arrange to meet with your staff within 24 hrs to discuss this action at your offices.

Sincerely,

Lori Podolak

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R.P.M. for C. Roughan — 15 May 08
RA/QA Approval — Date

15 May 08
Engineering Approval — Date

Enclosure: Drawing R70290 Rev S
SAR Rev 8, cover page plus pages ii, iii, iv, 2-18 thru 2-20, 5-1, 5-8, 5-10, 7-2 thru 7-8 & 8-3
List of Affected Pages

Figure Withheld Under 10 CFR 2.390

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40 NORTH AVE, BURLINGTON, MA 01803

DESCRIPTIVE DRAWING

TITLE	MODEL 702 ISOTOPE SHIELD SHIPPING CONTAINER		
SIZE B	DWG. NO. R70290		REV S
	SCALE: 1/4	SHEET 1 OF 10	

Figure Withheld Under 10 CFR 2.390

QSA GLOBAL 40 NORTH AVE, BURLINGTON, MA 01803		DESCRIPTIVE DRAWING	
TITLE	MODEL 702 ISOTOPE SHIELD SHIPPING CONTAINER		
SIZE B	DWG. NO. R70290		REV S
	SCALE: 1/8	SHEET 2 OF 10	

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TITLE	MODEL 702 ISOTOPE SHIELD SHIPPING CONTAINER		
SIZE B	DWG. NO. R70290		REV S
	SCALE: 1/8	SHEET 3 OF 10	

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TITLE	MODEL 702 ISOTOPE SHIELD SHIPPING CONTAINER		
SIZE B	DWG. NO. R70290		REV S
	SCALE: 1/8	SHEET 4 OF 10	

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QSA GLOBAL 40 NORTH AVE, BURLINGTON, MA 01803		DESCRIPTIVE DRAWING	
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SIZE B	DWG. NO. R70290		REV S
	SCALE: 1/4	SHEET 5 OF 10	

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SIZE B	DWG. NO. R70290		REV S
	SCALE: 1/4	SHEET 6 OF 10	

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TITLE	MODEL 702 ISOTOPE SHIELD SHIPPING CONTAINER		
SIZE B	DWG. NO. R70290		REV S
	SCALE: 1/2	SHEET 7 OF 10	

Figure Withheld Under 10 CFR 2.390

QSA GLOBAL 40 NORTH AVE, BURLINGTON, MA 01803		DESCRIPTIVE DRAWING	
TITLE	MODEL 702 ISOTOPE SHIELD SHIPPING CONTAINER		
SIZE B	DWG. NO. R70290		REV S
	SCALE: 1/2	SHEET 8 OF 10	

Figure Withheld Under 10 CFR 2.390

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DESCRIPTIVE DRAWING

TITLE	MODEL 702 ISOTOPE SHIELD SHIPPING CONTAINER		
SIZE B	DWG. NO. R70290		REV S
	SCALE: 1/2	SHEET 9 OF 10	

Figure Withheld Under 10 CFR 2.390

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DESCRIPTIVE DRAWING

TITLE	MODEL 702 ISOTOPE SHIELD SHIPPING CONTAINER		
SIZE B	DWG. NO. R70290		REV S
	SCALE: 1/1	SHEET 10 OF 10	

List of Affected Pages	
Revision 4, 19 July, 2001	Revision in entirety. This revision supercedes previously submitted SAR's for the 702.
Revision 5, 12 March 2002	Revision in entirety. Incorporated changes to the nuclide capacities, profile information and minor typographical corrections.
Revision 6, 19 July 2002	Revision to Cover sheets, and page 13 (incorporate reference to IAEA para. 619, pages 20 and 22 (modifying the minimum capsule wall/weld thickness) and descriptive assembly drawings.
Revision 7, 24 Jun 2005	Revision to reformat following guidance in Regulatory Guide 7.9 Revision 2 and to document compliance with IAEA TS-R-1
Revision 8, 9 May 2008	Revision to incorporate changes requested under NRC RAI dated 28 Apr 08 and to make administrative changes to the SAR format. Revised pages include the cover page plus pages ii, iii, iv, 2-18 thru 2-20, 5-1, 5-8, 5-10, 7-2 thru 7-8 & 8-3

Safety Analysis Report

QSA Global, Inc.

Model 702
Type B(U) - 96
Transport Package

May 2008

Revision 8

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Table 2.7.4.1.b: Summary Table of Maximum Pressures

Package Configuration	Fire Conditions 800°C (1,472°F) Pressure Developed	Comments
702	14 psig[1] 53.3 psi[2]	Section 3.4.3.2

[1] – Pressure at 177°C (351°F). After which the gasket will burn and allow release of any pressure.
[2] – Pressure assuming the shield cask gasket does not burn off during the thermal test.

2.7.4.2 Differential Thermal Expansion

As demonstrated in Section 2.12.3 (Finite Element Analysis) the Model 702 package will not be adversely affected by differential thermal expansion.

2.7.4.3 Stress Calculations

As demonstrated in Section 2.12.3 (Finite Element Analysis), thermal differentials will have no detrimental effect on the interfaces between the stainless steel housing of the shield cask and the depleted uranium shielding in the cask.

Stresses may develop within the gasketed cavity in the shield. As shown in Section 3.4.3.2, the maximum pressure which could be generated in the shield cask with the gasket intact is 53.3 psi. As also shown in Section 3.4.3.2, this pressure is insufficient to cause a lid failure of the closure bolts. Therefore the containment will remain intact during the thermal test conditions.

2.7.4.4 Comparison with Allowable Stresses

All stresses calculated in Section 2.7.4 are well below strengths for the materials of construction. Further, the Model 702 package was demonstrated to pass both the Normal and Hypothetical Accident Conditions of transport. It is therefore concluded that the Model 702 package will satisfy the performance requirements specified by the regulations.

2.7.5 Immersion - Fissile Material

(Reference:

- *USNRC, 10 CFR 71.73 (c)(5)*
- *IAEA TS-R-1, paragraphs 731-733)*

Not applicable.

2.7.6 Immersion - All Packages

(Reference:
- *USNRC, 10 CFR 71.73 (c)(6)*
- *IAEA TS-R-1, paragraph 701 and 729)*

If the Neoprene cask cover gasket remains intact, the package would be subjected to an increased external pressure of 21.7 psig (10 CFR) and 290 psi (IAEA). The cask will withstand this pressure without loss of structural integrity.

If the gasket fails, the cylindrical special form source (primary containment) will be vulnerable to collapse due to the required assumed pressure increases of 21.7 psig and 290 psi for the respective regulatory references. The source capsules are fabricated from stainless steel. This analysis bounds any special form source capsule with a maximum inside radius of 0.195 inch (4.95 mm) and a minimum wall thickness and weld penetration of 0.01 inch (0.254 mm). From Reference 1, the external collapsing pressure for a thin walled cylinder is:

$$P_{collapse} = (t / R)(\sigma_y / (1 + (4\sigma_y / E)(R / t)^2))$$

Where:

t	=	0.01 in (Weld Thickness)
R	=	0.195 in (Inside Radius)
σ_y	=	30,000 psi (Yield Strength) (Reference 1)
E	=	28,000 ksi (Young's Modulus) (Reference 2)

From this relationship, the minimum collapsing pressure of the source capsule is 889.8 psi, which exceeds the required external pressure increases of 21.7 psig and 290 psi for the respective regulatory references.

Resource references:

1. Young, Warren C. Roark's Formulas for Stress & Strain, Sixth Edition. McGraw-Hill: New York, 1989, p. 634.

2. Hibbeler, R.C. Mechanics of Materials. 2nd Edition, 1991.

2.7.7 Deep Water Immersion Test (for Type B Packages Containing More than 10^5 A_2)

(Reference:

- *USNRC, 10 CFR 71.61*
- *IAEA TS-R-1, paragraph 657, 658 and 730)*

Not applicable. This package does not transport normal form radioactive material in quantities exceeding 10^5A_2.

2.7.8 Summary of Damage

(Reference:

- *USNRC, 10 CFR 71.73(a) and (b)*
- *IAEA TS-R-1, paragraph 701, 702, 716 and 726)*

Table 2.7.8.a summarizes the results of the Normal Conditions of Transport and Hypothetical Accident testing performed on the Model 702, in the sequence that the tests were completed.

Section 5 - SHIELDING EVALUATION

5.1 Description of Shielding Design

(Reference:

- *USNRC, 10 CFR 71.31*
- *IAEA TS-R-1, paragraph 701 and 702)*

5.1.1 Design Features

The principal shielding in the Model 702 transport package is the depleted uranium shield assembly and optional tungsten insert(s) used when necessary to obtain allowable dose rates as well as fix source capsule locations within the shield. The depleted uranium shielding weighs 217 lb (98 kg) ± 7 lb (3.2 kg). The shielding is cast as two pieces (shield and cover). Each piece is completely enclosed by stainless steel.

5.1.2 Summary Table of Maximum Radiation Levels

Table 5.1a includes radiation profile data obtained from the 702 package that was tested to the Normal Conditions of Transport under Test Plan 81 (see Section 2.12.2).

Table 5.1a: Model 702 Test Specimen TP81A
Summary Table of External Radiation Levels Extrapolated to Capacity of 15,000 Ci Ir-192 (Non-Exclusive Use) After Normal Transport Condition Testing Under Test Plan 81 Report

Normal Conditions of Transport	Package Surface mSv per hour (mrem per hour)			1 Meter from Package Surface mSv per hour (mrem per hour)		
Radiation	Top	Side	Bottom	Top	Side	Bottom
Gamma	0.26 (26)	0.53 (53)	0.027 (2.7)	0.009 (0.9)	0.014 (1.4)	0.002 (0.2)
Neutron	NA	NA	NA	NA	NA	NA
Total	0.26 (26)	0.53 (53)	0.027 (2.7)	0.009 (0.9)	0.014 (1.4)	0.002 (0.2)
10 CFR 71.47(a) Limit	2 (200)	2 (200)	2 (200)	0.1 (10)[1]	0.1 (10)[1]	0.1 (10)[1]

(Ref: Sheet "TP81(A) – After 1.2 m (4 Foot) Drop Test " Profile for the Model 702 sn 24 dated 13 Apr 99. Note that results are increased by a factor of 1.5 to reflect change in package capacity after performance of Test Plan 81. Copy of profile sheet located in Appendix C of Test Plan 81 Report (Section 2.12.2).

[1]Transport Index may not exceed 10. The Transport Index is equivalent to the 1 meter reading in mRem per hour (i.e., 5 mRem per hour at 1 meter = a Transport Index of 5.0).

[2]The maximum Transport Index based on the mrem per hour readings at one meter from the surface of this package was 1.4. All packages accepted and released for shipment under this Model designation will have a Transport Index less than or equal to 10.

5.4.3 Flux-to-Dose-Rate Conversion

Not Applicable. Flux rates were not used to convert to dose rates in any shielding evaluations.

5.4.4 External Radiation Levels

Radiation surveys for all 702 configurations showed maximum surface and 1 meter radiation levels from the transport packages within regulatory limits. Radiation surveys of 702 transport packages after undergoing normal and accident condition transport testing were also well within the regulatory limits.

5.5 Appendix

5.5.1 Appendix: Profile Measurements of the 702 containing Cs-137

5.5.2 Appendix: Microshield Calculations for the Model 702 containing Se-75 and Yb-169

Section 5.5.2 Appendix: Microshield Calculations for the Model 702 containing Se-75 and Yb-169

7.1.1.2.c Inspect the protective cage and skid. Assure all welded areas are not cracked or bent. If there is any evidence of bent or cracked welds contact QSA GLOBAL, INC. prior to shipping.

Assure metal skid sits firmly on the ground. Assure all threaded holes do not have damaged threads. If there are damaged threads, do not use the container. Contact QSA GLOBAL, INC. for repair information.

7.1.1.2.d Ensure the 702 shield cask lid eyebolt is straight and undamaged, and that the seal gasket is present and intact.

7.1.1.2.e Assure the hold down rods are not bent or damaged. If the rods are bent, they must be replaced prior to shipment. Assure the package components can be assembled as specified on the descriptive assembly drawings and that hardware is undamaged and can be installed as required.

7.1.1.2.f Assure all bolts and fasteners (hardware) required for assembly of the package and as specified on the drawing referenced on the Type B transport certificate are fit for use. Ensure the threads are not stripped and will fully engage when threaded into their respective holes. Visually examine the bolts/fasteners for any signs of fatigue cracking.

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

7.1.1.2.g If the container fails any of the inspections in steps 7.1.1.2.a-f, 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. None of the shield configurations for the Model 702 package are approved for wet loading.***

NOTE: ***All removal and installation of radioactive material contained within the 702 must be performed in a shielded cell/enclosure capable of holding the maximum isotope capacity of this container. This can only be performed by persons specifically authorized under an NRC or agreement state license. All necessary safety precautions and regulations must be observed to ensure safe transfer of the radioactive material.***

7.1.1.1 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(s) are secured into place in the storage positions in accordance with the following requirements. Compliance with the following requirements ensures that the sources are securely locked in position before shipment.

1. After installing the radioactive material into the 702, with tungsten insert when shipping Ir-192 to shield and fix the capsules in place, install the gasket. The gasket must be in good physical condition with no rips or tears. Place the cask cover onto the top of the 702 cask and seat the cover properly. To seat properly, the lid must lie flush with the top of the cask. This will effectively shield the container so that it can be safely handled.

2. The cask can then be removed from the shielded cell/enclosure. The operator should verify that the radioactive material is properly stored by surveying all sides of the cask.

3. The cask cover can then be properly installed on the cask and secured with the six 3/8-16 x 7/8 inch long hex head bolts. Install lock washers and a flat washer with the bolt. Torque the bolts to 236 ± 5 inch-pounds.

4. Seal wire two of the hex head bolts on the cask cover.

5. Place the cask onto the metal skid. Insert the four 1/2-13 hex head bolts with lockwashers through the cask bottom plate mounting holes and into the 4 holes on the steel plate of the metal skid. Torque the bolts to 370 ±5 inch-pounds.

6. Place the cask hold down assembly (clamp ring) onto the top of the cask. Inspect the four 1/2-13 threaded rods to assure that they are not damaged or bent. Insert the rods through the clamp ring and into the 4 steel weldments on the skid.

7. Secure the bottom of the threaded rod with a 1/2-13 square nut. The rod should completely engage the nut.

8. Secure the threaded rods with a 1/2-13 hex nut and steel lockwashers at the top of the clamp ring. Torque these to 370 ±5 inch-pounds.

9. Wipe test the cask and metal skid over an area of 300 square centimeters and assure the level of removable contamination is less that 0.0001 μCi (4 Bq) per cm^2.

10. Place the metal protective cage on the skid and secure it in 4 corners with lockwashers, flatwashers, and 1/2-13 hex head bolts. Torque the bolts to 370 ±5 inch-pounds.

11. Seal wire one of the drilled bolts to provide a tamper indicator seal. The seal wire should pass through the drilled head of the bolt and around the steel tubing.

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 0.0001 μCi (4 Bq) when averaged over a wipe area of 300 cm^2.

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 proper procedures 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 with a survey meter as soon as possible, preferably at the time of pick-up and no more than three hours after it was received during normal working hours. Radiation levels should not exceed 200 mR/hr at the surface of the transport package, nor 10 mR/hr at a distance of 1 meter from the surface.

7.2.1.2.b Record the actual radiation levels on the receiving report.

7.2.1.2.c If the radiation levels exceed these limits, 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 outer container for physical damage or leaking. If the package is damaged or leaking or it is suspected that the package may 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 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 Unload the 702 in accordance with the applicable licensing provisions for the user's facility related to radioactive material handling.

7.2.2.2 Remove the inner shield container from the Model 702 skid and protective cage assemblies.

7.2.2.3 Place the shield container in a shielded cell/enclosure capable of holding the maximum isotope capacity of this container.

7.2.2.4 Remove the six 3/8-16 x 7/8 inch long hex head bolts, lock washers and flat washers and remove the cover lid from the shield cask.

7.2.2.5 Use remote handling techniques to remotely unload each source and transfer the source to an alternate, shielded storage location.

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 702 transport package without an active source contained within the depleted uranium shielded container.

7.3.1. Perform the following procedure to confirm that there are no unauthorized sources within the container:

7.3.1.1 Place the shield container in a shielded cell/enclosure capable of holding the maximum isotope capacity of this container. Remove the cover. Remove any shield inserts used in that shield container and visually inspect the container for any source capsules.

7.3.1.2 Use remote manipulators, mirrors, and radiation monitors if necessary, inspect the container to verify that it is empty.

7.3.1.3 Once the shield cavity is determined to be empty, place all shield inserts back into the container and install the cover.

7.3.2 Assure that the levels of removable radioactive contamination on the outside surface of the transport package do not exceed 4 Bq/cm^2 (when averaged over 300 cm^2).

7.3.3 When it is confirmed that the Model 702 transport package is empty, survey the device and prepare the transport package for shipment. Survey the assembled package to ensure the external surface radiation level does not exceed 5 μSv/hr.

7.3.4 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 702 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.

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 μSv/hr 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.

8.2 Maintenance Program

8.2.1 Structural and Pressure Tests

Not applicable. Material certification 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 702 packaging is not designed to require increased or decrease 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.

8.2.3 Component and Material Tests

The transport package is inspected for tightness of fasteners, proper seal wires, general condition and fitness for use prior to each use (see Section 7.1.1). The gasket is inspected prior to each shipment. If there are any rips, tears, or degradation of the rubber, the gasket will be replaced.

Prior to each use, a radiation survey of the transport package is made to assure that the radiation levels do not exceed 200 mR/hr at the surface, nor 10 mR/hr at 1 meter from the surface.

8.2.4 Thermal Tests

Not applicable. The source content of the Model 702 package has no adverse 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

Inspections and tests designed for secondary users of this transport package under the general license provisions of 10 CFR 71.17(b) are provided in Section 7.

8.3 Appendix

Not applicable.