71-9314

QSA GLOBAL

QSA Global, Inc.
40 North Avenue
Burlington, MA 01803
Telephone: (781) 272-2000
Toll Free: (800) 815-1383
Facsimile: (781) 359-9191

29 July 2015

Ms. Michele Sampson, Chief
Spent Fuel Licensing Branch
U.S. Nuclear Regulatory Commission
Office of Nuclear Material Safety and Safeguards
Division of Spent Fuel Management
Mailstop 3WFN-14A44
11555 Rockville Pike
One White Flint
Rockville, MD 20852

RE: 10 CFR 71.95(a)(3) report for CoC number USA/9314/B(U)-96 and Certificate Amendment Request

Dear Ms. Sampson:

QSA Global, Inc. is making a report under 10 CFR 71.95(a)(3) concerning the Model 976 Series Type B packages (CoC 9314) and request for amendment of the Type B CoC. As part of the Type B package reviews initiated after issues identified on the Model 702 container, we noted similar instances on the Model 976 Series package where the design was not adequately implemented across the production and descriptive drawings referenced under the CoC. This 71.95 notification identifies the issues found and, includes additional root cause analysis and corrective actions intended to prevent recurrence.

1. 3056 Shield Unit Top Hat

The production drawing for the 3056 top hat specifies a 2 mm groove weld for this assembly but drawing R3056 Rev F specifies a 1/8 fillet weld instead. This is an error on drawing R3056. These shield units were grandfathered for use in the 976C package assembly and were obtained, as manufactured, from our parent company in the UK prior to their use in the 976 package design. All units in use comply with the production drawing specification for the top hat which calls for the 2 mm groove weld for this assembly as did the test specimen of the 976C used for hypothetical accident condition (HAC) testing. The 3056 shield unit is protected within the package assembly by the exterior drum and the cork inserts. Failure of the weld on the top hat under normal or accident transport conditions will have no adverse impact on the shielding or package integrity of the 976C as this component will be retained in place by the drum/cork inserts and weld failure will not be able to affect source integrity or package shielding ability.

Based on the above, continued use of 3056 shield units with top hats welded using a 2 mm groove weld will not create a substantial safety hazard under 10 CFR Part 21. We request amendment to the CoC to correct the weld specification for the 3056 top hat on drawing R3056 to reflect a 5/64 groove weld for the top hat component which is equivalent to the 2 mm groove weld. We have included revision to R3056 Rev G to correct this weld specification.

NMSSZD

2. 3056 Top Plate Construction

Review of the top plate construction on the 3056 top shield insert assembly has identified an alternate construction not currently shown on drawing R3056. On R3056 Revision G enclosed, sheet 3, we have added a notation to the 1/8 fillet weld specifications for the top plate and tube adaptor attachments to allow construction of the top plate as a single machined component instead of welded assembly and to allow attachment of the tube adaptors to the top plate by means of threadlocker instead of welding. The majority of units in use meet the requirements on drawing R3056 Revision F as welded assemblies, however, at least one unit in use is manufactured to this alternate construction.

The tube adaptors, along with the cap nuts, are maintained in place during transport over sources loaded into the source tubes by means of the top plate attachment to the shield assembly base and the top hat assembly. A single, fully machined, top plate with equivalent material thickness as the welded configuration will provide an equally strong plate as the welded configuration and therefore result in no adverse effect on the package integrity. Securing the tube adaptors to the top plate by threadlocker instead of welding the tube adaptors to the top plate will also not create a condition adverse to the package integrity. In this configuration, the top hat will retain the tube adaptor/cap nut components in place above the source tube during transport, which will prevent the source wire from moving out of the source tube under any condition of normal or hypothetical accident transport.

We have further updated sheet 3 to include the M16 thread specification for the top plate and the adaptor that is threaded into the plate of the shield insert. Lastly, we have referenced the optional use of threadlocker for attachment of the threaded tube adaptors to the top shield insert. The omission of these details was noted during the package review. No change to the package design has occurred. These additions to the drawing details are for completeness and accuracy.

Based on the above, continued shipment of 976C packages using 3056 shield units with the alternate construction described will not create a substantial safety hazard under 10 CFR Part 21 during transport. We request amendment to the CoC to revise the construction as shown on sheet 3 of drawing R3056 Revision G enclosed. This drawing change will allow continued safe transport of existing 3056 shield units as part of the 976 transport package.

3. 3056 Strap thread block and Handle Weldment

Review of the weld symbol formatting for the 3056 strap thread block and handle weldments identified errors in the specifications. These welds are shown corrected on drawing R3056 Revision G enclosed and now accurately reflect the welds on existing 3056 shield assemblies. The welds for the thread blocks are also clarified as "4X" instead of the three locations previously shown on this drawing by arrows.

These changes will have no adverse impact on package integrity as they correct the configuration call out for these welds and reflect the configuration present on test unit specimens used in performance testing for transport compliance. See enclosed Summary table of drawing changes for additional details.

4. Stainless Steel Jacket Components on 1911 Shield Unit

The material requirements from drawing R1911 accepted for transport from June 2005 through July 2009 required stainless steel for the jacket body and 300 series stainless steel for the jacket top and bottom plates. In July 2009 (Revision 4 of the CoC) these material requirements were changed to require all components meet "ASTM 304 stainless steel". But this specification was incomplete as there is no specification of "ASTM 304" and required further clarification. In addition, this

requirement change did not accurately reflect product manufactured and accepted under the earlier approved versions of drawing R1911. Although Revision F of drawing R1911 changed the material requirement for these parts to add an ASTM reference, there was no phase in date applied to this change, so this requirement applied retroactively to all previously manufactured units in use. Earlier versions of the production drawings for these parts did not comply with the new requirement.

When the change to drawing R1911 Rev F was made, the production drawings for these components were not correspondingly revised to add a requirement for material compliance to an applicable ASTM standard. The current production drawing for these components were changed to specify the material as 304 stainless steel, but they do not reference any applicable ASTM standard. Previous revisions of production drawings in effect prior to July 2009, and used to obtain components incorporated into the existing 1911 shield units, only required these components to be stainless steel. No material grade was specified on those production drawings.

A review of manufacturing records for the components used on existing 1911 assemblies manufactured before and after July 2009 was performed. Records review for all parts identified that the inspection records used for product acceptance from 2005 to 2007 did not require a material check or certification for the jacket parts used in production units. The components used on existing 1911 shield assemblies were all obtained and accepted during this 2005-2007 time period.

The failure to require any material check during inspection of these components occurred because the approval review process for the inspection requirements was not completed properly for these inspection records. For the records in question, they did not include the required QA review and approval on the master inspection instruction. The QA review would have required a material conformance inspection requirement for these components. As a result, the actual grade stainless steel used on these units was not confirmed or noted at the time of component acceptance for manufacture into the 1911 shield assemblies. This affects 16 shield assembly units in use as part of 976F Type B packages.

A material analysis was performed on a 1911 for the top, bottom and side components of the 1911 jacket material. Results of this analysis identified the top and bottom components to be 304/321 stainless steel and the body to be 304 stainless steel. There were some remaining components for these parts in stock from the original inspection lots used in the manufacture of the current 1911 shield units. These components were analysed and produced results indicating the bottom components to be 304 or 301 stainless steel and the body components to be 304 stainless steel. Since all these components were obtained from the same supplier it is likely that the materials used for the 1911 units in current use are of the same grade materials as those analysed from the remaining stock inventory.

The 1911 shield units are protected within the 976 package by cork inserts and a drum with a bolted/clamped lid. Testing performed to justify use of the 976F package under Test Plan Reports 90 (SAR Section 2.12.2) and 163 (SAR Section 2.12.3) demonstrated that after Normal and Hypothetical accident condition testing, the inner shield assemblies will remain protected and undamaged within the drum assembly. The important mechanical properties of 304, 301 and 321 stainless steel are essentially the same for their use on the 1911 shield unit. Based on the protected configuration of the 1911 shield unit inside the 976F package assembly, 1911 jacket components made from any austenitic, weld grade stainless steel will be sufficient to ensure the package integrity during transport.

Based on the above, continued shipment of 976F packages using 1911 shield units with jacket material made from stainless steel will not create a substantial safety hazard under 10 CFR Part 21 during transport. Therefore, we request amendment to the CoC to revise the material specification for these parts on drawing R1911 (see enclosed revision G) to read as follows:

"Stainless steel, parts made after June 2015 are 304 or 304L stainless steel per ASTM A240."

This drawing change will allow continued safe transport of existing 1911 shield units as part of the 976F transport package. At this time we confirm that we have removed all non-compliant components from inventory and will revise the production drawing for these parts to only allow acceptance of material that complies to ASTM A240. No further manufacture of a 1911 shield unit using this part will be performed until the part is compliant with the CoC.

5. 1911 lead insert screws

The material requirement for the 1911 lead insert screws used to attach the handle and to secure the brass housing to the lower lead insert identifies these components as "18-8 stainless steel - NITS". These screws have no safety significance to the package integrity. They are an aid to handling of the insert after transport and are already identified as NITS on drawing R1911.

Based on the identification as NITS on drawing R1911, any material specification for these screws are irrelevant from a transport package standpoint. There is no metallic or plastic material that could be used to make these screws that could create an adverse galvanic reaction between the screws and the lead/brass they come in contact with once assembled. As such material compliance for this NITS component is not necessary to maintain the package integrity for transport.

Based on the above, continued shipment of 976F packages using 1911 shield units with lead insert screws made from any available material will not create a substantial safety hazard under 10 CFR Part 21 during transport. We request amendment to the CoC to revise the material specification for these parts on drawing R1911 (see enclosed revision G) to read:

"Optional - Steel or plastic – NITS"

This drawing change will allow continued safe transport of existing 1911 shield units as part of the 976 transport package.

6. 855 Eyebolt Weld Specification

The weld specification for the 855 eyebolt on drawing R85590 sheet 2 includes identification of a 3/16 fillet weld on the eyebolt below the cover plate. Due to the presence of the steel nut welded to underside of the cover assembly, it is not possible to weld the eyebolt below the plate once it is threaded into the steel nut. The current weld specification for the eyebolt requires correction to accurately reflect the weld requirements on this component.

This is a correction of an error in the weld specification for this weld on drawing R85590, to reflect fabrication of the units in use as well as those that were used to demonstrate package compliance under normal and hypothetical transport conditions. Change will have no adverse impact on package integrity as this corrects configuration call out for this weld.

10 CFR 71.95 Root Cause Analysis and Corrective Actions to Prevent Recurrence

The issues identified for the 976 Series packages are similar in nature and cause as to the issues identified for the 650L, 770, 702, 680-OP and 741-OP transport packages addressed with your office under their respective CoCs. Actions taken to prevent recurrence in response to these previously identified issues were considered and some additional corrective actions were deemed applicable in light of the 976 Series package review.

The 976 Series packages are a combination design of an overpack drum/cork assembly used in conjunction with pre-existing inner shield designs for the 855 and 3056 assemblies. In the case of the 1911 inner shield, the design was a modification to an existing UK shield design which added a stainless steel jacket over a pre-existing inner lead shield assembly. This package series was created to enable continued Type B transport of inner shield assemblies that could not be transported without addition of the drum/cork overpack assembly. The initial Type B for these package designs was approved in June 2005. Over the 10 years since its initial approval, the level of detail expected for Type B packages during submission actions increased to add greater detail for:

- Material specifications for items important to package safety/integrity
- Welding specifications for assemblies important to package safety/integrity

Generation of drawings for these package designs was a combination of new component designs and incorporation of design details from package drawings originally generated by the UK parent company that did the original design work for the inner shield assemblies. In some cases, the translation of manufacturing requirements present on all versions of the grandfathered drawings and pre-existing shield units failed to fully reflect all applicable transport configuration details.

In other cases, material specification requirements were added to the descriptive drawings with implementation dates, but then were not translated as necessary to the affected production drawings impacted. In some cases no phase in date was used and the descriptive drawing change did not fully incorporate pre-existing components still in use. These errors are attributed to failures to accurately review historical inspection records prior to implementing changes without an implementation date, and failure to implement production drawing changes after changes had been accepted on descriptive drawings by the NRC.

From 2009-2010, seven of the Type B package design descriptive drawings were revised in a short time span to add greater material/welding specifications affecting the 976, 660-OP, 865, 680-OP, 741-OP, 702 and 650L designs.

Although a work instruction existed to describe the process for issuance/revision to descriptive assembly drawings under WI-E-1303, and this procedure addressed a review of drawing changes against production drawings, this procedure was determined to be unnecessary by the Engineering Manager at that time and was made obsolete on 23 September 2008. Subsequent failure to adequately define material specifications for some of the 976 package components was a combination of:

- lack of guidance documentation
- human error
- a large volume of drawing revisions processed within a small time period
- drawing revisions processed by a small group of individuals in Engineering and Regulatory

In addition to the corrective actions taken in response to Condition Reports (CR) 1730, 1731, for the Model 702 transport package and CR 1755 for the Model 650L package, some additional corrective actions are recommended:

a. Enhance inspection guidance procedures to identify standard inspection requirements for certain types of inspections and/or Quality Classifications for product acceptance. This would require Inspection Instruction Record (IIR) inspections for welding to require confirmation of welding IAW applicable AWS standards and visual inspection by inspectors qualified to SNT-TC-1A requirements. It would also require material confirmation for Class A or B components as part of the standard acceptance criteria.

b. Revise WI-R-3127 "Preparation and Approval of Submissions to Regulatory Authorities" to add a section specific to review, and if necessary initiate changes to production drawings under an ERF for changes accepted under a descriptive assembly drawing tied to an active product approval.

c. Revise WI-E-1303 to more clearly identify that descriptive drawing changes, without phase in dates, must require removal from use of any non-compliant product as part of the phase in level. Also that descriptive drawing changes need to include review of changes against current and, when applicable, historic production drawings and inspection records to ensure adequate coverage for material construction and specifications on descriptive drawings.

These additional actions, in conjunction with the actions previously initiated under CRs 1730, 1731 and 1755, are believed to be sufficient to prevent recurrence of the issues identified during the review of the 976 package design.

The issues identified in this letter did not contribute to any incidents or package failures related to the safe use of the Model 976 Series packages in transport. The corrective actions discussed in this letter are considered sufficient to prevent recurrence of the issues identified for the Model 976 Series. Continued compliance will be verified as part of our routine Quality Assurance internal audits which include performance of Type B container processing for production staff.

In addition to the other changes described in this letter, we request some minor changes to the package drawings to more accurately specify the package. A detailed table is included with this letter which describes the changes and their impact on the package design. In summary the additional drawing changes include:

a. Consolidation of drawings R976A, R976C, R976F, R97615, R97615-1, R97615-2, R97616, R97623, R97623A and R97637 into a single drawing, R97600. This consolidation also makes the following modifications to the previous drawing descriptions:

1) Changed nameplate material description to remove reference to "Type B Label".
2) Removed ≈.02 Min. from the Steel seal wire description for the 976 Series packages.
3) Added reference to rivets used to attach 976 package nameplate.
4) Revised format of some cork insert chamfer and dimension descriptions for consistency and clarity.

b. On drawing R97608, the outer drum assembly identifies the welding performed on the threaded blocks added to the drum lid. This component is obtained as an off the shelf component that is then Commercially dedicated for use in the 976 package design. Production and descriptive drawings for this drum were based on the drawing provided by the drum supplier. In this case, the drawing provided by the supplier did not clearly show the drum weld seam on the assembly, although it's presence could be implied based on a finish note related to passivation of that weld seam on the vendor provided drawing. As such, identification of the weld seam was not noted on QSA production or descriptive drawings and no specification for weld quality or weld inspection was previously specified for this drum.

   As received, the drum incorporates a seam weld along the side of the drum barrel which is not currently shown on drawing R97608. This seam weld is part of all purchased drums and was present on the 976 test specimens used to demonstrate compliance to the NC and HAC transport testing and on all assemblies used on active 976 Series packages.

   Enclosed is revision J to drawing R97608 which makes the following changes for accuracy, completeness and flexibility:

   1) Adds identification of the seam weld for this drum,
   2) Notes 2 & 4 on this drawing have been revised to address the addition of this seam weld to AWS D1.6 and inspection to ASNT SNT-TC-1A,
   3) Identifies the "lid", "barrel" and "barrel seam weld" components on the drawing and
   4) Removes reference to the 1999 revision of the AWS D1.6 standard.

   The removal of the AWS revision date has no significant impact on the performance of the package, and is consistent with a similar change that was approved under USA/9269/B(U)-96 as part of a request made in letter dated 1/13/15 which was incorporated at Revision 8 of the CoC.

c. Currently drawings R85590 and R3056 include notes that indicate no manufacture of these assemblies after 01 January 2009. We have clarified the notes on both these drawings to allow manufacture/use of components that may require replacement during service/maintenance of the shield units such as hardware, threadlocker, nameplates, etc. and have identified these as Service Replaceable Parts (SRP). The intent remains that no new assemblies, or welding of existing assemblies for repair, will be performed. However, the revised wording will more clearly identify the components allowed for normal service related replacement where the items have a limited operational service life. This change is for clarification purposes only and will have no adverse impact on the package integrity of the 976A and 976C designs during transport.

d. On drawing R3056 we have removed note 1 from sheet 1 and moved the information to sheet 4 under the material description for Item 8. This change is for formatting purposes only and had no impact on package construction or design.

e. Drawing R3056 sheet 1 we have added the optional use of silicon rubber sealant between the top insert flange and where it contacts the lead pot assembly. This was part of the original 3056 shield unit fabrication but was not specifically referenced under the CoC drawing. Additionally we have added reference to the optional use of washers and threadlocker for the M10 socket head screws used on this assembly. Lastly, we have added the optional use of soft solder in the socket heads of the M10 screws used to attach the top shield insert to the shield base assembly. The addition of these details to drawing R3056 Revision G will not adversely impact the performance of these shield assemblies in the 976C transport package and are made for completeness and accuracy.

f. On drawing R3056 sheet 2 we added "2X" to the weld specification for the 1/8 fillet weld for the strap attachment and removed the second arrow showing the weld location. This change is for simplicity only and does not impact the construction or package design.

g. R3056 sheet 2, we have revised the drill/tap specification for the strap threaded blocks to clarify tap and drill dimensions for component. We also added "Lead Pot Assembly" to description of Item 1. These changes were for accuracy and clarity.

h. Drawing R1911 note references on pages 2 and 3 revised to remove reference to AWS revision date from the standard reference on this drawing. This change has no significant impact on the performance of the package, and is consistent with a similar change that was approved under USA/9269/B(U)-96 as part of a request made in letter dated 1/13/15 which was incorporated at Revision 8 of the CoC.

i. Drawing R1911 sheet 4 Item 5, sheets 5 and 6 Item 3 handles listed as optional. These components are not important to safety and are present only as handling aids after transport. Their presence is not required for the safe transport of the 976F package so we have identified these handles as optional on drawing R1911 Revision G enclosed.

j. Revise drawing R1911 to change the material requirement for the plain washers on sheet 3 to reference the washer as "Optional Plain Washer" and identify it as "Steel –NITS" instead of "Austenitic Stainless Steel". This component has no safety significance to the package integrity. It is a secondary aid to ensure the cover screws remain fully secured to the body of the 1911 shield pot, but its absence or failure will not adversely impact the package integrity. Should these washers be missing, and should all four of the M8 screws become unthreaded during transport, the lid will still be retained in place securing the inner shield inserts and source(s) by means of the cork inserts which are held in place against the top of the shield assembly preventing the lid from being removed while contained in the drum assembly.

   Testing of this assembly for NCT and HAC transport demonstrated that the drum lid cannot be removed under these test conditions, therefore, under all transport conditions the absence or failure of the 1911 shield unit washers will have no adverse impact on the package integrity.

k. On drawing R85590, sheet 4, the reference to the source hold down caps has been modified to identify an optional iridite, chromate or other protective plating applied as a finish to these components (see enclosed drawing R85590 Revision H). This change increases the level of detail previously provided under drawing R85590 and will have no adverse impact on the function of these components or the package integrity. These changes more accurately reflect the standard transport configuration for these components and meet the level of detail for transport drawings that is currently expected for NRC CoC submission approvals.

l. Drawing R85590 sheet 1 table combined information from Material column into a single "Description" column. Change was made for simplicity and has no impact on package design or integrity.

m. Drawing R85590 material specification for the shield unit nameplate revised from "24GA(.025) SS" to "Steel". The current specification is more restrictive than necessary for this inner shield unit nameplate and we are therefore requesting this revision. This change will have no adverse impact on the package integrity for transport.

n. Revise drawing R85590 sheet 2 to clarify weld specification for steel nut below cover plate. The weld is shown on the current drawing but not clearly specified by a weld symbol. This change corrects that missing information.

o. Revise drawing R85590, Sheet 3 to allow optional use of threadlocker on screws used to attach the lock assemblies to the 855 shield assembly. This change will serve to increase security of these screws as addition to the seal wire present on some of the screws and will have no adverse impact on the package integrity during transport.

p. Revise weld specification on sheet 3 for 3/16 & 1/8 fillet welds on 855 housing and sheet 4 for 1/16 fillet weld on the lock body to correct specifications to reflect standard weld formatting requirements. No change to the welds occurs. Change for accuracy only.

The issues identified in this letter did not require any corresponding changes to the SAR for the 976 Series packages beyond updating of some of the referenced drawings. All drawing revisions associated with these issues are included as enclosures to this letter. Should you have any additional questions, or wish to discuss this issue or our amendment request, please contact me.

Sincerely,

Lori Podolak
Manager,
Regulatory Affairs/Quality Assurance
Ph: (781) 505-8241
Fax: (781) 359-9191
Email: Lori.Podolak@qsa-global.com

RA/QA Approval — Date: 29 JUL 2015

Engineering Approval — Date: 29 JUL 2015

Enclosures:
Drawing R1911 Revision G
Drawing R97608 Revision J
Drawing R85590 Revision H
Drawing R3056 Revision G
Drawing R97600 Revision B

cc: ATTN: Document Control Desk
Director, 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

Summary Table of Changes to 976 Drawings

Formatting changes include:

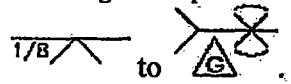
- Consolidation of drawings R976A, R976C, R976F, R97615, R97616, R97615-1, R97615-2, R97623, R97623A and R97637 and replacement with new drawing R97600. Information on drawing R97600 that varies from the information previously specified on one of these old reference drawings will be identified as a change in the following table. All consolidated drawings are obsolete with the issuance and acceptance of drawing R97600.

Change Location	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
R97600, Sheet 1	Material description for nameplate changed from "Steel Fireproof Type B Label" to read "Fireproof Steel".	No	No change to package construction or design. Reference to Type B unnecessary.	None. Not applicable.
R97600, Sheet 1	Material description for seal wire changed from "Seal Wire ⌀.02 Min. Steel" to read "Steel".	No	No change to package construction or design. Notation change made to remove unnecessary detail in current material description. Minimum diameter of seal wire is not necessary so long as the wire thickness is sufficient to serve its intended purpose as indicated in the SAR Revision 8 Section 1.3.2. "*The Model 976 Series packages incorporate a steel seal wire attached to the lid closure band and lid closure band bolt. This seal wire is not readily breakable, therefore if it is broken during transport, it serves as evidence of possible unauthorized access to the contents.*"	None. Not applicable.
R97600, Sheet 1	Added reference to rivets used to attach the nameplate to the drum assembly.	No	None. Change made for increased accuracy for construction of assembly as rivets had not been previously specified, although they were used.	None. Not applicable.
R97600, Sheet 2	Replaced previously specified "¼ TYP" reference for chamfers with "1/4 x 45° TYP"	No	None. No impact on units expected. Change made for clarity.	None. Not applicable.
R97600, Sheet 3, Both Views	Changed "⌀1 x 2 Deep 4X" to "4X ⌀1 Thru"	No	No change to package construction or design. Material description change made for simplicity clarity and to meet intent that these holes be through the 2" thickness of the part at these points.	None. Not applicable.
R97600, Sheet 3 Both Views	Replaced the "2X 15 ½" dimension with "4X 1 ¼" dimension.	No	Description change for clearance is equivalent to previous dimension.	None. Not applicable.

Summary Table of Changes to 976 Drawings

Change Location	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
R97608	Added identification tags for the drum "Lid", "Barrel" and "Barrel Seam Weld"	No	No change to package construction or design. Information added for clarity.	None. Not applicable.
R97608, Notes 2 and 4	Drawing updated to reflect presence of drum body seam weld and to specify after 1 June 2015 that drum seam welding performed will be in accordance with AWS D1.6 and inspection will be by individuals qualified to ASNT SNT-TC-1A.	No	This drum is a commercially dedicated part obtained from a drum fabricator as a standard product. As received, the drum incorporates a seam weld along the side of the drum barrel which is not currently shown on drawing R97608. This seam weld was part of the purchased drum and was present on the 976 test specimens used to demonstrate compliance to the NC and HAC transport testing and on all assemblies used on active 976 Series packages. The added reference to the drum seam weld specification is made for accuracy and completeness.	None. Not applicable.
R97608, Note 2; R1911 Sheet 2, Note 2 & R1911 Sheet 3 Note 2	Removed reference to 1999 revision of AWS D1.6.	No	This change is made to remove an overly restrictive condition and has no significant impact on the package performance and is consistent with similar changes made under USA/9269/B(U)-96, USA/9035/B(U)-96 and USA/9027B(U)-96 as part of recent amendment approvals.	None. Not applicable.
R3056, Sheet 1	Note 7 is removed from sheet 1 and is now shown on sheet 4 as material description for Item 8.	No	No change to package construction or design. Formatting change only.	None. Not applicable.
R3056, Sheet 1	Note 6 revised to clarify that the assembly is not to be manufactured after 1 Jan 2009, except for parts identified as Service Replaceable Parts (SRP). These include items 5 through 12 which are denoted (SRP) in the item description table.	No	No change to package construction or design. Detail added for accuracy as the ability to replace hardware/fasteners/adhesives is not considered to be "assembly manufacture" but part of routine service and maintenance of existing units.	None. Not applicable.
R3056, Sheet 1	Items 9 through 12 added. These optional components include washer, threadlocker, soft solder and silicone rubber sealant.	No	No change to package construction or design. Components have historically been used on some units but not specifically shown on drawing R3056. Use of these components will not adversely impact the performance of these shield assemblies in the Model 976C package. The detail is added for completeness.	None. Not applicable.

Summary Table of Changes to 976 Drawings

Change Location	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
R3056, Sheet 2	Sectional views added and dimensional information slightly relocated, but otherwise unchanged.	No	No change to package construction or design. Changes made for simplicity.	None. Not applicable.
R3056, Sheets 2 & 3	Weld call outs add reference to notes on sheet 1.	No	No change to package construction or design. Change for clarity.	None. Not applicable.
R3056, Sheet 2	Formatting for strap weldment revised to change  to . Weld notation added "4X".	Yes	Weld specification on current revision incorrectly specified. Weld symbol for all shield assemblies in use compliant to symbol shown on Revision G of drawing R3056. Change will have no adverse impact on package integrity as this corrects configuration call out for this weld.	Certificate amendment request to correct error. Transport of package 976C halted until receive of amendment.
R3056, Sheet 2	Formatting for handle weldment revised to correct  to . Previous fillet weld specification in error. Welds on units are actually flare bevel welds.	Yes	Weld specification on current revision incorrectly specified. Weld symbol for all shield assemblies in use compliant to symbol shown on Revision G of drawing R3056. Change will have no adverse impact on package integrity as this corrects configuration call out for this weld.	Certificate amendment request to correct error. Transport of package 976C halted until receive of amendment.
R3056, Sheet 2	Added "2X" to weld specification for 1/8 fillet weld for strap attachment.	No	Change added for accuracy	None. Not applicable.
R3056, Sheet 2	Revised the drill/tap specification for the strap threaded blocks to clarify tap and drill dimensions for component.	No	Change made for accuracy and clarity.	None. Not applicable.
R3056, Sheet 2	Added "Lead Pot Assembly" to description of Item 1 on this sheet.	No	Change added for accuracy.	None. Not applicable.
R3056, Sheet 3	Adds Alternate construction for top plate allowing component to be machined complete as a single piece, without welding. Weld specification reference to Note 1 on sheet 1 also added.	Yes	This change has no significant impact on the performance of the package. Units manufactured as a machined piece without welding are expected to perform as well or better than welded assemblies under normal and accident condition transport requirements.	Certificate amendment request to correct error. Transport of affected 976C package shield units halted until amended.

Summary Table of Changes to 976 Drawings

Change Location	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
R3056, Sheet 3	Adds M16 tapping for top plate and top plate adaptors. Also note added to indicate that if adaptor not welded to top plate, then threadlocker can be optionally used to attach adaptor.	Yes	This change has no significant impact on the performance of the package. Securing the tube adaptors to the top plate by threadlocker instead of welding the tube adaptors to the top plate will not create a condition adverse to the package integrity. In this configuration, the top hat will retain the tube adaptor/cap nut components in place above the source tube during transport, which will prevent the source wire from moving out of the source tube under any condition of normal or hypothetical accident condition transport.	Certificate amendment request to correct error. Transport of affected 976C package shield units halted until amended.
R3056, Sheet 4	The 1/8 fillet weld on the top hat has been revised to read as a 5/64 groove weld.	Yes	Review of production drawings revealed that this weld was originally specified as a 2 mm groove weld, but this was incorrectly translated to drawing R3056 when the historic fabrication of this component was documented. The 3056 shield assemblies were grandfathered for use in the 976C package and were obtained, as manufactured, from our parent company in the UK prior to their use in the 976 package design. All units in use comply with the production drawing specification for the top hat, as did the test specimen used for hypothetical accident condition testing. The 3056 shield unit is protected within the package assembly by the exterior drum and the cork inserts. Failure of the weld on the top hat under normal or accident transport conditions will have no adverse impact on the shielding or package integrity of the 976C as this component will be retained in place by the drum/cork inserts and weld failure will not be able to affect source integrity of package shielding ability.	Certificate amendment request to correct error. Transport of package 976C halted until receive of amendment.

Summary Table of Changes to 976 Drawings

Change Location	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
R1911, Sheet 2	Replaced material identification in table with reference to Note 5. Note 5 clarifies that stainless steel parts manufactured after June 2015 are 304 or 304L per ASTM A240.	Yes	Detailed review of this issue is contained in QSA Global, Inc. letter dated 20 April 2009. At that time, the material commitments made under the descriptive drawing did not account for components accepted prior to July 2009 and which account for the units in current transport. Further the material specification failed to reference the applicable ASTM standard for those materials that would apply for any new fabrication. Analysis of shield assemblies in use identified the stainless steel as 304, 301 and 321. The important mechanical properties of these stainless steels are essentially the same for their use on the 1911 shield unit. Based on the protected configuration of the 1911 shield assembly inside the 976F package, 1911 jacket components made from any grade stainless steel will be sufficient to ensure the package integrity during transport.	Certificate amendment request to correct error. Transport of package 976F halted until receive of amendment.
R1911, Sheet 3	Revised Item 6 to reference the washer as "Optional Plain Washer", identify it as "Steel – NITS" instead of "Austenitic Stainless Steel".	No	No change will be made on transport units until amendment approved. This component has no safety significance to the package integrity. It is a secondary aid to ensure the cover screws remain fully secured to the body of the 1911 shield pot, but its absence or failure will not adversely impact the package integrity. Should these washers be missing, and should all four of the M8 screws become unthreaded during transport, the lid will still be retained in place securing the inner shield inserts and source(s) by means of the cork inserts which are held in place against the top of the shield assembly preventing the lid from being removed while contained in the drum assembly. Testing of this assembly for NCT and HAC transport demonstrated that the drum lid cannot be removed under these test conditions, therefore, under all transport conditions the absence or failure of the 1911 shield unit washers will have no adverse impact on the package integrity.	None. Not applicable.

Summary Table of Changes to 976 Drawings

Change Location	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
R1911 Sheet 4 Items 5 & 6; Sheets 5 & 6 Item 3	Component for handles listed as optional and NITS with, in some cases, changes to more generic material specifications.	No	These changes are made as these components are not important to safe transport and are present only as handling aids for the inserts after transport. Their presence is not required for safe transport of the 976F package so they have been identified as NITS on the drawing.	None. Not applicable.
R1911 Sheet 4 Item 3	Attachment screws for lead insert listed as optional and changed to more generic material specifications.	Yes	These screws have no safety significance to the package integrity. They are an aid to handling of the insert after transport and are already identified as NITS on drawing R1911. Based on the identification as NITS on drawing R1911, any material specification for these screws are irrelevant from a transport package standpoint. There is no metallic or plastic material that could be used to make these screws that could create an adverse galvanic reaction between the screws and the lead/brass they come in contact with once assembled. As such material compliance for this NITS component is not necessary to maintain the package integrity for transport.	Certificate amendment request to correct error. Transport of package 976F halted until receive of amendment.
R85590 Sheets 1, 3 and 6	Note 5 on sheet 1 revised to add reference to parts identified as "Service Replaceable Parts (SRP)" and affected components/assemblies identified as SRP on sheets 1, 3 and 6 as applicable.	No	No change to package construction or design. Detail added for clarity and accuracy as the ability to replace hardware/fasteners/adhesives is not considered to be "assembly manufacture" but part of routine service and maintenance of existing units.	None. Not applicable.
R85590, Sheet 1	Table revised to remove the "Material" column. Information on material combined into "Description" column.	No	None. Administrative change only.	None. Not applicable.
R85590, Sheet 1	Description for nameplate revised to remove reference to thickness.	No	This inner shield assembly label is for added information during storage/use of the inner shield assembly and has no impact on the package transport integrity. As such, specification of this label's thickness is overly restrictive.	None. Not applicable.

Summary Table of Changes to 976 Drawings

Change Location	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
R85590, Sheet 2	Weld specification for eyebolt corrected to remove top and bottom 3/16 fillet weld on weld specification shown for the eyebolt attachment. Due to presence of steel nut welded to underside of the cover assembly, it is not possible to weld the eyebolt below the plate once it is threaded into the steel nut.	Yes	This is a correction of an error in the weld specification for this weld on drawing R85590, to reflect fabrication of the units in use as well as those that were used to demonstrate package compliance under normal and hypothetical transport conditions. Change will have no adverse impact on package integrity as this corrects configuration call out for this weld.	Certificate amendment request to correct error. Transport of package 976A halted until receive of amendment.
R85590, Sheet 2	Arrow added for 3/16 fillet weld shown on weld nut but not clearly specified on the current drawing.	No	This change adds detail for the weld shown of the steel nut to the bottom of the cover plate and does not change the design or configuration of the package. Added detail for accuracy.	None. Not Applicable.
R85590, Sheet 3	Added Note 2 to drawing to allow for optional use of threadlocker on screws on this sheet.	No	This change has no adverse impact on package integrity. No change will be made on transport units until amendment approved.	None. Not Applicable.
R85590, Sheet 3 & 4	Change to specification for 3/16, 1/8 and 1/16 fillet welds to correct to generally accepted format for weld symbol.	No	No change to package specification. Change made to comply with standard weld symbol formatting.	None. Not Applicable.
R85590, Sheet 4	Added Notes 1 and 2 to sheet. Note 1 states that all lock assembly parts are considered to be SRP. Note 2 adds optional use of iridite, chromate or other protective finish to the source hold down caps.	No	This change increases the level of detail previously provided under drawing R85590 and will have no adverse impact on the function of these components or the package integrity.	None. Not Applicable.

Security-Related Information Figure
Withheld Under 10 CFR 2.390

ERF #	APPROVALS	DATE
3305	S. Gay	29 Jul 15
		29 Jul 15

UNLESS OTHERWISE SPECIFIED:
ALL DIMENSIONS ARE INCHES, TOLERANCE ±1/8

QSA GLOBAL
40 NORTH AVE, BURLINGTON, MA 01803

DESCRIPTIVE DRAWING

TITLE: MODEL 976 TRANSPORT PACKAGE

SIZE	DWG. NO.	REV
A	R97600	B
	SCALE: NONE	SHEET 1 OF 4

Security-Related Information Figure
Withheld Under 10 CFR 2.390

QSA GLOBAL 40 NORTH AVE, BURLINGTON, MA 01803		DESCRIPTIVE DRAWING
TITLE	MODEL 976 TRANSPORT PACKAGE	
SIZE A	DWG. NO. R97600	REV B
	SCALE: NONE	SHEET 2 OF 4

Security-Related Information Figure
Withheld Under 10 CFR 2.390

QSA GLOBAL

40 NORTH AVE, BURLINGTON, MA 01803

DESCRIPTIVE DRAWING

TITLE MODEL 976 TRANSPORT PACKAGE

SIZE	DWG. NO.	REV
A	R97600	B
	SCALE: NONE	SHEET 3 OF 4

Security-Related Information Figure
Withheld Under 10 CFR 2.390

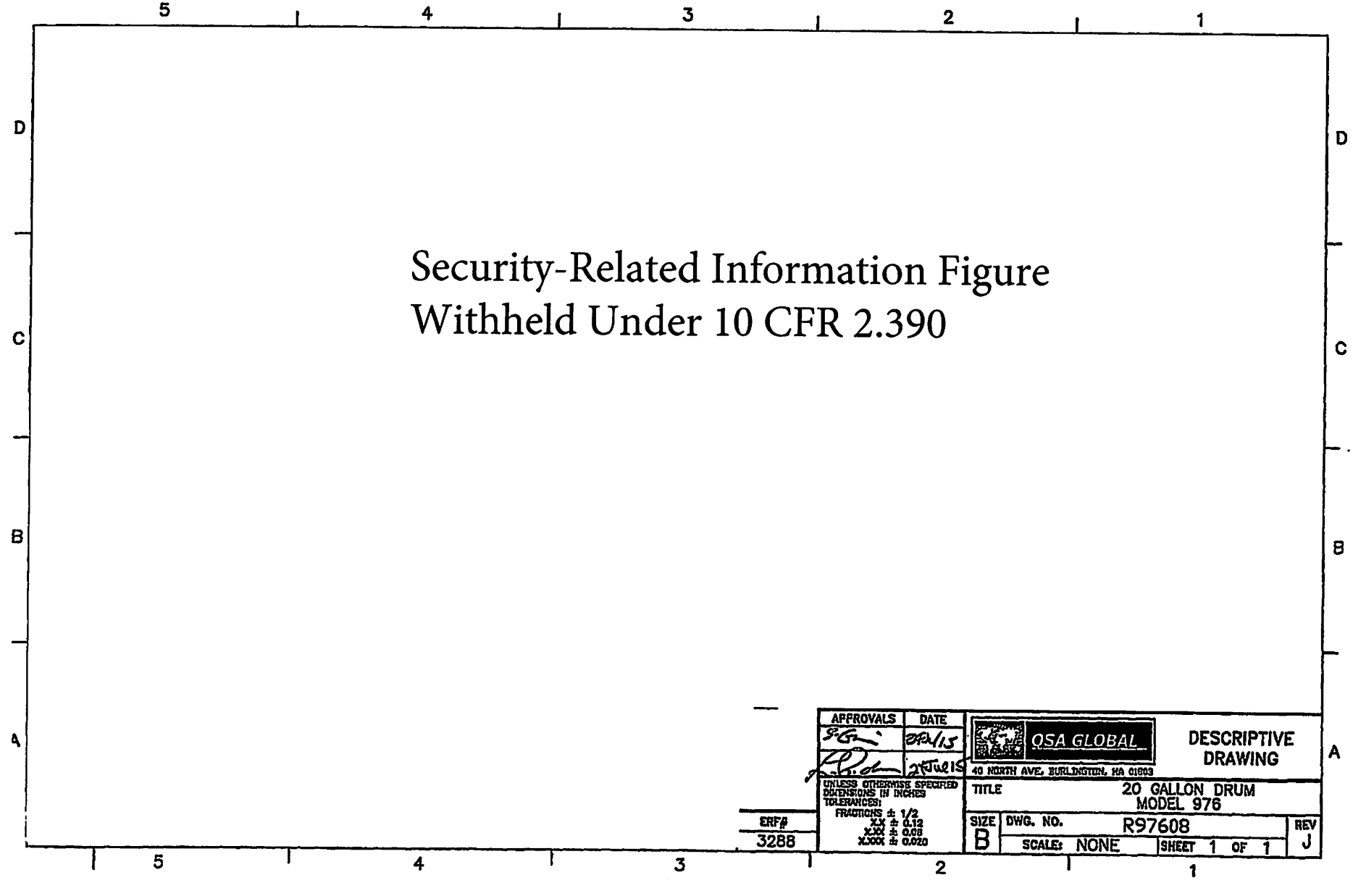
QSA GLOBAL

40 NORTH AVE, BURLINGTON, MA 01803

DESCRIPTIVE DRAWING

TITLE	MODEL 976 TRANSPORT PACKAGE		
SIZE A	DWG. NO. R97600		REV B
	SCALE: NONE	SHEET 4 OF 4	

Security-Related Information Figure
Withheld Under 10 CFR 2.390



Security-Related Information Figure
Withheld Under 10 CFR 2.390

ERF #	APPROVALS	DATE
3288		

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

QSA GLOBAL
40 NORTH AVE, BURLINGTON, MA 01803

DESCRIPTIVE DRAWING

TITLE: MODEL 3056 SHIELD CONTAINER

SIZE	DWG. NO.	REV
A	R3056	G
	SCALE: NONE	SHEET 1 OF 4

Security-Related Information Figure
Withheld Under 10 CFR 2.390

QSA GLOBAL				DESCRIPTIVE DRAWING
TITLE	MODEL 3056 SHIELD CONTAINER			
SIZE A	DWG. NO. R3056			REV G
	SCALE: NONE	SHEET 2 OF 4		

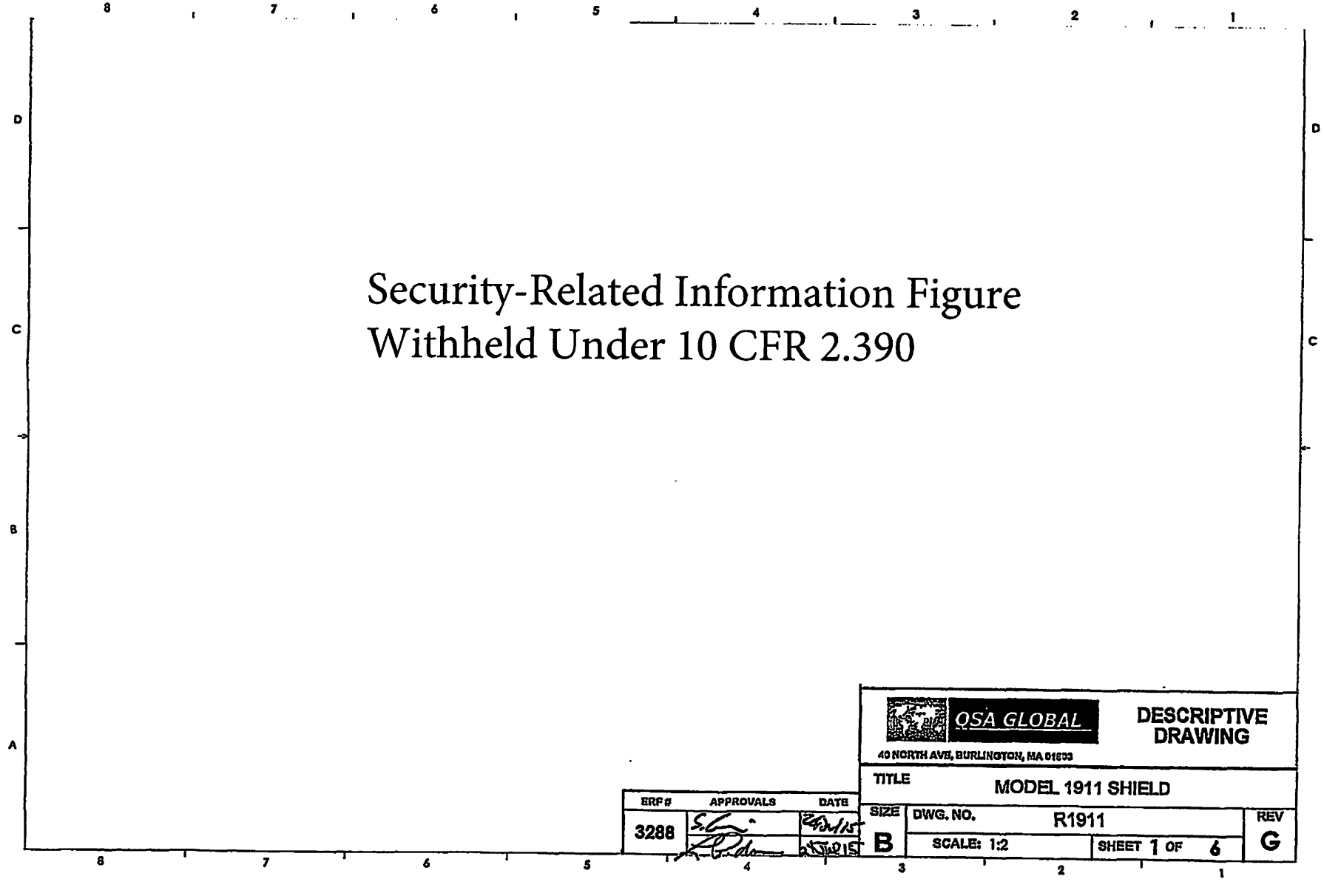
Security-Related Information Figure
Withheld Under 10 CFR 2.390

QSA GLOBAL				DESCRIPTIVE DRAWING
TITLE	MODEL 3056 SHIELD CONTAINER			
SIZE A	DWG. NO. R3056			REV G
	SCALE: NONE	SHEET 3 OF 4		

Security-Related Information Figure
Withheld Under 10 CFR 2.390

UNLESS OTHERWISE SPECIFIED DIMENSIONS IN INCHES TOLERANCES: FRACTIONS ± 1/8 X.X ± 0.12 X.XX ± 0.06 X.XXX ± 0.020	QSA GLOBAL		DESCRIPTIVE DRAWING	
	TITLE	MODEL 3056 SHIELD CONTAINER		
	SIZE A	DWG. NO. R3056		REV G
		SCALE: NONE	SHEET 4 OF 4	

Security-Related Information Figure
Withheld Under 10 CFR 2.390



Security-Related Information Figure
Withheld Under 10 CFR 2.390

QSA GLOBAL 40 NORTH AVE, BURLINGTON, MA 01803			DESCRIPTIVE DRAWING	
TITLE	MODEL 1911 SHIELD			
SIZE B	DWG. NO.	R1911		REV G
	SCALE: 1:2		SHEET 2 OF 6	

Security-Related Information Figure
Withheld Under 10 CFR 2.390

QSA GLOBAL 40 NORTH AVE, BURLINGTON, MA 01803			DESCRIPTIVE DRAWING
TITLE	MODEL 1911 SHIELD		
SIZE B	DWG. NO. R1911	SCALE: 1:2	SHEET 3 OF 6	REV G

Security-Related Information Figure
Withheld Under 10 CFR 2.390

QSA GLOBAL 40 NORTH AVE, BURLINGTON, MA 01803			DESCRIPTIVE DRAWING	
TITLE	MODEL 1911 SHIELD			
SIZE B	DWG. NO.	R1911		REV G
	SCALE: 1:2		SHEET 4 OF 6	

Security-Related Information Figure
Withheld Under 10 CFR 2.390

QSA GLOBAL 49 NORTH AVE, BURLINGTON, MA 01803				DESCRIPTIVE DRAWING
TITLE	MODEL 1911 SHIELD			
SIZE B	DWG. NO.	R1911		REV G
	SCALE: 1:2		SHEET 5 OF 6	

Security-Related Information Figure
Withheld Under 10 CFR 2.390

QSA GLOBAL 40 NORTH AVE, BURLINGTON, MA 01803			DESCRIPTIVE DRAWING	
TITLE	MODEL 1911 SHIELD			
SIZE B	DWG. NO.	R1911		REV G
	SCALE: 1:2		SHEET 6 OF 6	

Security-Related Information Figure
Withheld Under 10 CFR 2.390

APPROVALS	
	2/20/15
	2/20/15

DIMENSIONS IN INCHES
TOLERANCES:
FRACTIONS ±1/8
X ± 0.1
XX ± 0.05
XXX ± 0.005

QSA GLOBAL

DESCRIPTIVE DRAWING

TITLE MODEL 855 SOURCE CHANGER

SIZE	DWG. NO.	REV
A	R85590	H
	SCALE: NONE SHEET 1 OF 6	

ERF #	3288

Security-Related Information Figure
Withheld Under 10 CFR 2.390

QSA GLOBAL			DESCRIPTIVE DRAWING
TITLE	MODEL 855 SOURCE CHANGER		
SIZE A	DWG. NO. R85590		REV H
	SCALE: NONE	SHEET 2 OF 6	

Security-Related Information Figure
Withheld Under 10 CFR 2.390

QSA GLOBAL		DESCRIPTIVE DRAWING
TITLE MODEL 855 SOURCE CHANGER		
SIZE A	DWG. NO. R85590	REV H
	SCALE: NONE	SHEET 3 OF 6

Security-Related Information Figure
Withheld Under 10 CFR 2.390

QSA GLOBAL			DESCRIPTIVE DRAWING
TITLE	MODEL 855 SOURCE CHANGER		
SIZE A	DWG. NO. R85590		REV H
	SCALE: NONE	SHEET 4 OF 6	

Security-Related Information Figure
Withheld Under 10 CFR 2.390

QSA GLOBAL			DESCRIPTIVE DRAWING
TITLE	MODEL 855 SOURCE CHANGER		
SIZE A	DWG. NO. R85590		REV H
	SCALE: NONE	SHEET 5 OF 6	

Security-Related Information Figure
Withheld Under 10 CFR 2.390

QSA GLOBAL			DESCRIPTIVE DRAWING
TITLE MODEL 855 SOURCE CHANGER			
SIZE A	DWG. NO. R85590	SCALE: NONE	SHEET 6 OF 6	REV H