

71-9148



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1 December 2014

Mr. Michael Waters, Chief  
Licensing Branch  
Division of Spent Fuel Storage and Transportation  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
11555 Rockville Pike, Mailstop EBB-3D-02M  
One White Flint  
Rockville, MD 20852

RE: 10 CFR 71.95(a)(3) report for CoC number USA/9148/B(U)-96 and  
Certificate Termination Request

Dear Mr. Waters:

QSA Global, Inc. is making a report under 10 CFR 71.95(a)(3) concerning the Model 770 Type B package (CoC 9148). Previously we notified your office regarding fabrication issues identified for some of our Model 702 packages (USA/6613/B(U)-96). As part of the corrective action from that issue, we implemented a review of the fabrication records associated with other, older Type B package designs to determine if similar issues existed on those packages. This notification is being made based on information we discovered related to the Model 770 source changer. A review of the production records associated with the single package that is used under this Type B approval identified some areas where the package does not fully comply with all of the Type B certificate requirements.

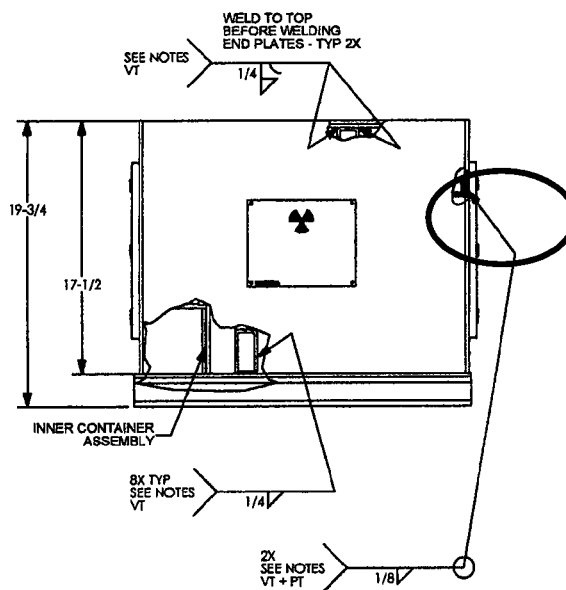
There is only one Model 770 in existence, serial number 12. There is also no intention to manufacture any other packages under this approval. The Type B certificate for this package is maintained solely to support transport of Model 770 serial number 12. This unit was manufactured and released for use as a Type B package 10 years ago in September 2004. During its fabrication, discrepancies in the construction were identified under non-conformance reports and disposition of those issues were performed by staff under the Quality Assurance program in place at that time. A review of those dispositions as well as some variations allowed under this older version of the QA program identified the following issues related to the Model 770 package:

1. Dye Penetrant Testing of Welds identified on drawing R77091 Rev A Sheet 1

In 2004, the QA program procedures allowed a single Engineer to make "Redlined" changes to a production drawing without those changes being reviewed by Regulatory or Quality Assurance for product in current production. Although the visual inspections were performed as specified on drawing R77090 Revision A, during manufacture an Engineer removed the dye penetrant test requirements from the production drawings which prevented completion of that testing.

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This change was only identified on the copies of redlined drawings that accompanied the production work order for this unit. Regulatory/QA did not see the redlined changes until the original work order records were retrieved from offsite archive during performance of this recent manufacturing review. The redlined deletions affected all welds that specified dye penetrant testing on sheet 1 of drawing R77091 Revision A. In all but one case, these welds were external to the package and were accessible for us to perform a dye penetrant test on them. The one weld not accessible is shown below.

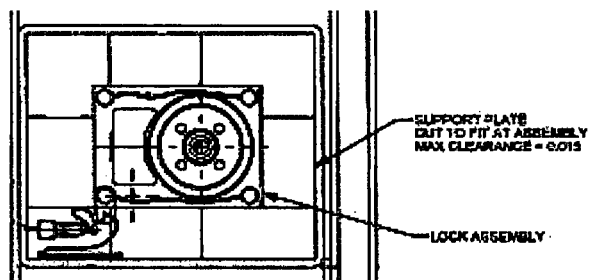


All external welds from drawing R77091 Revision A were dye penetrant tested on 12 November 2014. The dye penetrant weld testing identified instances of undercut, undersized welds, and areas of lack of fusion on the external container welds. The condition of the external welds put into question the integrity/quality of the internal welding. Additional actions taken to address the weld inspection results and the container integrity are addressed at the end of this letter.

The procedure that allowed an Engineer to redline production drawings during the production process was revised in 2005 to eliminate the redline option from the procedure. Since that time, any change to a production drawing during production has required revision to the drawing, or review and approval under either a Concession/Deviation Request or Temporary Manufacturing Instruction (TMI). These documents, at minimum, require the review and approval of Engineering and Regulatory prior to allowing implementation of the change which ensures that requirements of the Type B certificates are not compromised by the proposed change. Since this is a legacy issue and procedurally the issue was corrected in 2005, no further process or procedure modifications are considered necessary at this time to prevent recurrence.

## 2. Shim Plate Addition

At the time of manufacture, the unit was identified as non-conforming due to gaps present between the support plates, the lock assembly and the tunnel walls. To correct these gaps and provide a contact fit between these components, the non-conformance was dispositioned to install stainless steel shim plates in the gaps after which they were welded into place. The addition of the stainless steel shim plates compensated for variability in the dimensions of the support plates and has no adverse impact on the Model 770 ability to comply with normal or hypothetical accident conditions of transport.



## 3. Intermittent Weld Specifications on Inner Framework Construction

When manufactured, the  $\frac{1}{4}$  fillet welds identified on the inner construction framework were noted as being longer than specified and the spacing between skip welds was shorter than specified. The specification called for 1 inch welds spaced every three inches. Welding on 770 serial number 12 was actually  $1\frac{1}{4}$  -  $1\frac{1}{2}$  inches long spaced every  $2\frac{1}{4}$  to  $2\frac{3}{4}$  inches apart. This deviation was evaluated under a non-conformance report as having no adverse impact on the package since the increased welding would result in a stronger internal assembly. At the time this change should have required revision to the descriptive assembly drawing referenced under the Type B certificate, but staff involved in approval of this non-conformance report failed to ensure this was properly reflected under the Type B at that time.

## 4. 770 Skid Construction

Review of the manufacturing records for 770 serial number 12 included a non-conformance report that identified an issue with the package weight. An in process measurement of the weight indicated that the package was 8 pounds heavier than would be allowed under the Type B approved maximum weight of 970 lbs. At the time of manufacture, the production drawing and the descriptive drawing did not agree regarding the size of the square tubing used on the Model 770. The descriptive drawing called for  $1\frac{1}{2}$ " square tubing but the production drawing specified 2" square tubing. This discrepancy was not noted during the manufacture of the 770.

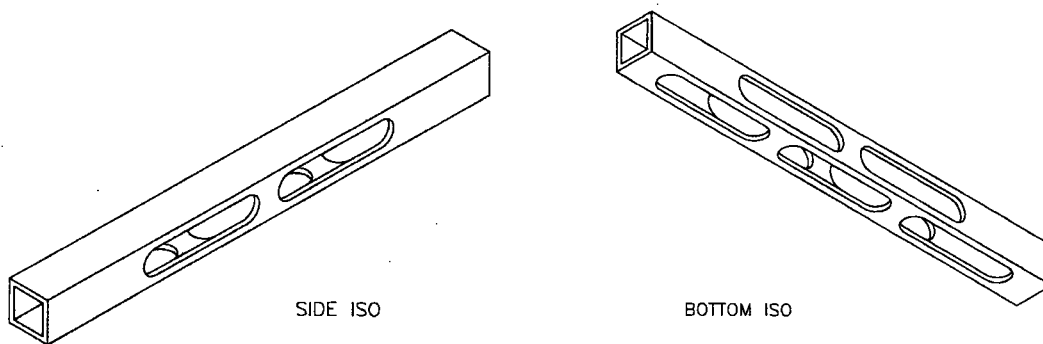
The correction implemented in 2004 to address the weight issue for the 770 was to remove some material from the stainless steel tubes (RBS-6 from drawing R77091) that support the package base plate by cutting slots into the square tubing. The removed material would lighten the package weight and meet the approved maximum weight on the certificate.

Documents of the evaluation performed in 2004 stated that the skid tubes did not serve as any structural integrity for the package. The evaluation further indicated that the certificate drawing only showed a generic description of the skid tubes as they were not a critical component.

The reason for determining the skid tubes were generic on the descriptive drawing is unclear since the drawing in effect at that time (R77090 Revision D) did specify the skid tubes (RBS-6) as " $1\frac{1}{2}$  x  $1\frac{1}{2}$  x 23 LG x  $\frac{1}{4}$  wall stainless steel". This description should imply that the tubes were solid across all faces of the tube with a wall of  $\frac{1}{4}$  inch. It is possible that the individuals performing the assessment at that time failed to identify the material specification for the RBS-6 components on drawing R77090 sheet 3 of 6 and interpreted the pictorial representation on the drawing as generic enough to allow the skid modifications performed without requiring amendment of the Type B certificate.

Unfortunately the individuals involved with this modification for the Model 770 serial number 12 are no longer employed by QSA Global, Inc. and so the actual reason for the misinterpretation that occurred in 2004 may never be fully understood. Regardless, the interpretation at that time was that modification of the skid tubes would still meet the Type B as long as the modifications had no impact on the original Type B testing.

The modification to the skid tubes was documented on drawing 77000-2 MOD. This drawing covered the addition of fully rounded slots to the RBS-6 tubes. Each slot measured 1.25" tall by 6" long and there was a 1 inch space between adjacent slots. A total of two slots were added to the left and right sides of the tube and three slots were added to the bottom of each tube. This modification was performed on all three RBS-6 tubes attached to the package.



An evaluation was performed, on September 30, 2004, noting that the addition of the tube slots would have no effect on the ability of the skid to support the package under normal handling conditions. It further assessed the impact on the normal and hypothetical accident condition testing. The physical testing performed on the Model 770 package demonstrated that the most vulnerable drop test orientations for the package was the top corner (normal accident conditions) and the side edge (hypothetical accident conditions). It was assessed that removal of material from the skid tubes would have no detrimental effect on the package in either of these orientations as the skid tubes would not receive the impact force under these drop orientations. It was further concluded that if the package was dropped onto the base plate tubes, the removed material would allow more tube deformation upon impact, which would absorb additional energy that would otherwise have been transmitted to the bottom of the Model 770. Under this drop condition, the package, with slots in the RBS-6 tubing, would be expected to perform better than the units tested under Test Plan Reports 88 and 114 (reference SAR Sections 2.12.2 and 2.12.3).

The modification to the skid tubes will also have no impact on the Model 770 package's ability to comply with the thermal requirements of 10 CFR 71.71(c)(1) and 71.43(g). Thermal calculations contained in the Safety Analysis Report (SAR) Revision 10 Section 3.4 were based on modelling of the package as a rectangular solid so no benefit was taken by factoring temperature reductions associated with air flow under the package through and between the skid tubes supporting the base plate. Since the skid tubes are not factored into the thermal evaluation, removal of the skid material will have no impact on the package thermal evaluation.

The issues identified in this letter did not contribute to any incidents or package failures related to the safe use of the Model 770 in transport. Transport of the Model 770 was stopped as of September 19, 2014. The program changes which occurred in 2005 are considered sufficient to prevent recurrence of the issues identified for the Model 770 in this letter as they will ensure no recurrence of this type of issue for any other package designs. 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.

Based on the external weld results dye penetrant inspection results on 770 serial number 12, it is concluded that the external, and potentially the internal, welds for this container do not comply with the applicable acceptance standards. Due to the construction requirements of the Model 770, it was determined that repair/rework of this unit was not advisable at this time. And since QSA Global, Inc. will also not perform any new manufacture for additional 770 packages, we therefore request termination of the Type B approval for the Model 770 (USA/9148/B(U)-85) at this time.

Should you have any additional questions, or wish to discuss this issue or our amendment request, please contact me.

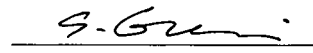
Sincerely,



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RA/QA Approval

10 DEC 2014  
Date

  
Engineering Approval

1 DEC 2014  
Date

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