



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 3, 2014

Ms. Lori Podolak
Manager, Regulatory Affairs/Quality Assurance
QSA Global, Inc.
30 North Avenue
Burlington, MA 01803

SUBJECT: APPLICATION FOR REVISION 1 TO CERTIFICATE OF COMPLIANCE NO.
6613 FOR THE MODEL NO. 702 PACKAGE – SECOND REQUEST FOR
ADDITIONAL INFORMATION

Dear Ms. Podolak:

By letter dated December 12, 2013, QSA Global, Inc. (QSA) submitted an application for amendment of Certificate of Compliance (CoC) No. 6613 for the Model No. 702 transportation package.

In connection with our technical review, we need the information identified in the enclosure to this letter. Additional information requested by this letter should be submitted in the form of revised safety analysis report pages. We request that you provide this information by June 27, 2014.

The staff is available to meet with you to discuss your proposed responses. If you have any questions regarding this matter, I may be contacted at (301) 287-9165.

Sincerely,

A handwritten signature in blue ink that reads "John A. Vera".

John Vera, Project Manager
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-6613
TAC No. L24870

Enclosure: Request for Additional Information

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Manager, Regulatory Affairs/Quality Assurance
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/RA/

John Vera, Project Manager
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ADAMS Accession No.: ML14155A085

OFC	SFST	SFST	SFST	SFST	SFST	SFST
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DATE	5/27/14	6/03/14	6/02/14	6/02/14	6/3/14	

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REQUEST FOR ADDITIONAL INFORMATION
FOR THE
MODEL NO. 702 PACKAGE

DOCKET NO. 71-6613

By letter dated December 12, 2013, QSA Global, Inc. (QSA) submitted an application for amendment of Certificate of Compliance (CoC) No. 6613 for the Model No. 702 transportation package. The application proposed to increase the maximum content weight from 200 grams to 400 grams, to revise the package thermal and pressure calculations based on new supplemental information, adding reference to a new source capsule for contents, and clarifying the output activity when transporting Ir-192.

This request for additional information (RAI) identifies information needed by the staff in connection with its review of the Model No. 702 package application. The staff reviewed the application using the guidance in NUREG-1609, "Standard Review Plan for Transportation Packages for Radioactive Material."

Each individual RAI section describes information needed by the staff to complete its review of the application and to determine whether the applicant has demonstrated compliance with the regulatory requirements.

SHIELDING

1. Clarify how the activity was determined for the Ir-192 source used to establish the licensing basis.

This information was originally requested as part of RAI 1 in Reference 1. The staff's question asked: *"Current package limits were based on scaling measured prototypes and although activity of the source is provided in the SAR, the SAR is silent on how this activity was determined (output or content activity)."* The applicant's response gives a history of the package's use and its intended use. Although the staff finds this information helpful in clarifying the reason for the request, the certificate limits must be based on evaluations. The staff's concern is that if the activity of the source used to determine content limits was already "output activity" then by specifying in the CoC as "content activity" might be too high as self-shielding was already accounted for in determining package limits. Section 5.5.3 of the SAR contains some information on an Ir-192 source used to make measurements but does not provide any information on how the source activity was determined (output or content) nor on the size and encapsulation of the source.

This information is needed to determine compliance with the dose rate regulations in 10 CFR 71.47 and 10 CFR 71.51(a)(2).

2. Provide the limiting dimensions of the source and encapsulation.

This information was originally requested as part of RAI 2 in Reference 1. The staff's question asked: *"Provide additional information on the factor of 2.3 used to determine the 6,500 Ci of Ir-192 including the range of source geometries for which this factor applies."* The applicant's response states that the factor of 2.3 applies to source material not exceeding 4 mm, that this is typical of radiography source designs, and that 99.97% of all sources manufactured had an overall source stack length of 4 mm or less. However, the applicant also stated that the largest stack length made in 2013 on a single source was 5.25 mm tall. The QSA 702 must meet all regulations for all possible sources.

- a. The applicant should provide the output activity limit considering the applicable attenuation factor for sources with a stack height up to 5.25 mm; and
- b. The applicant should clarify the source geometry and encapsulation. From the information submitted, the assumed source geometry is cylindrical. However, as source geometry is not specified in the certificate, the staff does not know if this assumption is representative or bounding. The applicant should clarify the source geometry and justify that the cylindrical geometry is representative or bounding and include all bounding dimensions, not just the stack height, but radius as well. The applicant also needs to provide information on encapsulation. The report provided in the previous RAI response uses a 0.5 mm stainless steel encapsulation. The applicant should justify that this is representative or bounding.

This information is needed to determine compliance with the dose rate regulations in 10 CFR 71.47 and 10 CFR 71.51(a)(2).

3. Provide additional justification for the factors used to scale the self-shielding of Ir-192 and encapsulation or provide justification that the QSA 702 can handle a larger thermal heat load.

The staff reviewed the report submitted, Amersham International Plc, "Health Physics and Safety Technical Note 96/31," October 1996. There are statements in this report that do not give the staff confidence in the simplifications, qualification, and benchmarking of the method. In Section 1 on page 3 it states: *"The approach is not ideal and better results should be available shortly when a program ordered from AEA Technology has been obtained and put into use."* Section 4.4 states: *"Gammashield a more sophisticated program for calculating dose rates from sources, taking into account their shape and self absorption, has been ordered and should be available within a month or so. It is not expected to give results significantly different from those given in this report but since it has been tested much more rigorously than an 'in house' program the ratios will be recalculated using the new program."* The applicant should state if the factors have been recalculated or confirmed using the new program. Based on some of

these statements, the staff sought additional confidence in the factors provided in the report and performed independent dose rate calculations at 1 m using MCNP5 of an unshielded Ir-192 point source, compared to a self-shielded Iridium cylinder of 4 mm and 5.25 mm height and diameter, with a 0.5 mm stainless steel encapsulation. The staff's calculations give a maximum of factor of 2.8 for the 4 mm cylinder and 3.4 for the 5.25 mm cylinder. Since a higher self-attenuation factor is more conservative for calculating dose rates, the staff's concern is with the thermal load. By maintaining output curies at 6500Ci, the staff's calculations are saying that a source could be 20% higher (92 watts x 1.2 = 110 watts) for a 4 mm source or 48% higher (92 watts x 1.48 = 136 watts) for a 5.25 mm source. The applicant should either justify the current factors based on the statements in the report, or address the possibility of the factors being as high as those demonstrated by staff calculations by justifying the increase in thermal load. The staff notes that before the neutrino energy was omitted for the current amendment, the previous thermal evaluation was as high as 130 watts.

This information is needed to determine compliance with the dose rate regulations in 10 CFR 71.47 and 10 CFR 71.51(a)(2).

References:

1. Letter from J. Vera (US NRC) to L. Podolak (QSA Global, Inc.), "Application for Revision 1 to Certificate of Compliance No. 6613 for the Model No. 702 Package – Request for Additional Information," April 3, 2014 (ADAMS Accession No. ML14098A287).