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

June 25, 2015

Mr. Troy Hedger
President
Alpha-Omega Services, Inc.
9156 Rose Street
P.O. Box 789
Bellflower, CA 90706

SUBJECT: CERTIFICATE OF COMPLIANCE NO. 9316, REVISION NO. 4, FOR THE MODEL NOS. AOS-25A, AOS-50A, AOS-100A, AOS-100B, AND AOS-100A-S PACKAGES

Dear Mr. Hedger:

As requested by your application dated May 6, 2015, supplemented June 12, 2015, enclosed is Certificate of Compliance No. 9316, Revision No. 4, for the Model Nos. AOS-25A, AOS-50A, AOS-100A, AOS-100B, and AOS-100A-S packages. Changes made to the enclosed certificate are indicated by vertical lines in the margin. The staff's safety evaluation report is also enclosed.

The approval constitutes authority to use the package for shipment of radioactive material and for the package to be shipped in accordance with the provisions of Title 49 of the *Code of Federal Regulations* (49 CFR) 173.471. Those on the attached list have been registered as users of the package under the general license provisions of 10 CFR 71.17 or 49 CFR 173.471.

If you have any questions regarding this certificate, please contact Pierre Saverot of my staff at (301) 415-7505.

Sincerely,

/RA/ A. H. Hsia for

Mark Lombard, Director
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9316
TAC No. L25015

Enclosures:
1. Certificate of Compliance No. 9316, Rev. No. 4
2. Safety Evaluation Report
3. Registered Users

Upon removal of Enclosure 3, this document is uncontrolled

cc w/encls. 1&2: R. Boyle, Department of Transportation
J. Shuler, Department of Energy, c/o L. Gelder

Mr. Troy Hedger
President
Alpha-Omega Services, Inc.
9156 Rose Street
P.O. Box 789
Bellflower, CA 90706

SUBJECT: CERTIFICATE OF COMPLIANCE NO. 9316, REVISION NO. 4, FOR THE MODEL NOS. AOS-25A, AOS-50A, AOS-100A, AOS-100B, AND AOS-100A-S PACKAGES

Dear Mr. Hedger:

As requested by your application dated May 6, 2015, supplemented June 12, 2015, enclosed is Certificate of Compliance No. 9316, Revision No. 4, for the Model Nos. AOS-25A, AOS-50A, AOS-100A, AOS-100B, and AOS-100A-S packages. Changes made to the enclosed certificate are indicated by vertical lines in the margin. The staff's safety evaluation report is also enclosed.

The approval constitutes authority to use the package for shipment of radioactive material and for the package to be shipped in accordance with the provisions of Title 49 of the *Code of Federal Regulations* (49 CFR) 173.471. Those on the attached list have been registered as users of the package under the general license provisions of 10 CFR 71.17 or 49 CFR 173.471.

If you have any questions regarding this certificate, please contact Pierre Saverot of my staff at (301) 415-7505.

Sincerely,

/RA/ A. H. Hsia for
Mark Lombard, Director
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9316
TAC No. L25015

Enclosures:
1. Certificate of Compliance No. 9316, Rev. No. 4
2. Safety Evaluation Report
3. Registered Users

Upon removal of Enclosure 3, this document is uncontrolled

cc w/encls. 1&2: R. Boyle, Department of Transportation
J. Shuler, Department of Energy, c/o L. Gelder

(Closes TAC No. L25015)
Filename: G:/SFST/PART 71 CASEWORK/9316.R4.docx; 9316.R4.LETTER&SER.docx

ADAMS PKG: ML15169A965 ADAMS P8 Letter No.: ML15169AB016
Enclosure 1: CoC: ML15169B027 Enclosure 3: Registered Users: ML15169B030
E=With attachment/enclosure N=No copy C=Without attachment/enclosure

OFC	SFM	E	SFM	E	SFM	E	SFM			
NAME	PSaverot		MDeBose		JVera for MSampson		AHsia for MLombard			
DATE	6/5/2015		6/5/15		6/22/15		6/25/2015			

OFFICIAL RECORD COPY

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

SAFETY EVALUATION REPORT

Model Nos. AOS-025A, AOS-50A, AOS-100A, AOS-100B, and AOS-100A-S Packages
Certificate of Compliance No. 9316
Revision No. 4

SUMMARY

By application dated May 6, 2015, supplemented June 12, 2015, Alpha-Omega Services, Inc. (AOS) submitted an amendment request to change a note on the licensing drawings, remove the swivel hoist rings from the licensing drawings, remove the requirement to perform a thermal survey prior to every shipment, revise a condition of the certificate of compliance (CoC), and add the Quality Assurance Program (QAP) as Chapter 9 of the application.

NRC staff reviewed the amendment request using the guidance in NUREG-1609, "Standard Review Plan for Transportation Packages for Radioactive Material." Based on the statements and representation in the application, as supplemented, and the conditions listed below, the staff concludes that the proposed changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

EVALUATION

The amendment request included several changes to four items that were previously specified either in the CoC or in the application. The applicant also requested the addition of a Chapter 9 to the application to include the QAP in the application in order to respond to a requirement from the Canadian Nuclear Safety Commission (CNSC).

The first of these changes requests a modification of a note on two of the licensing drawings, i.e., Drawing No. 183C8491, Rev. I, sheet 1, note 2 "Certification Drawing AOS-100 Axial Shielding Plate" for the Model Nos. AOS-100A, AOS-100B, and AOS-100A-S packages, and Drawing No. 183C8485, Revision H, sheet 1, note 1 "Certification Drawing AOS-025A Liner" for the Model No. AOS-25A package. The note read "All surfaces to be electroless nickel plated with a minimum thickness of 21 µm (0.00083 inch)," and the applicant justified that: (i) nickel plating is performed mainly to facilitate the decontamination of the tungsten shielding components, and (ii) the tungsten components, as shown on those two drawings, are already regularly removed for cleaning. Staff found that the nickel plating is neither not essential for the package, nor safety-related, and that the tungsten alloy is corrosion resistant (thus, precluding galvanic corrosion from occurring or going undetected). The staff finds acceptable the modified note on those two licensing drawings, i.e., "Surfaces to be electroless nickel plated with a minimum thickness of 21 µm (0.00083 inch). Surfaces may be completely or partially plated. Plating is designated as Safety Classification C." The staff believes operational flexibility will be enhanced.

The second change requests the removal of the Swivel Hoist Rings from Drawings No. 105E9722, Rev. I, sheets 1 and 2 for the Model No AOS-025A package; Drawing No. 166D8138, Rev. I, sheets 1 and 2, for the Model No. AOS-050A package; and Drawing No 105E9713, Rev. I, sheets 1 and 2, for the Model Nos. AOS-100A, AOS-100B, and AOS-100A-S packages. The applicant justifies the removal of all references to the swivel hoist rings from the licensing drawings by the fact that these hoist rings are removed from the impact limiters prior to

package shipment. As a consequence, they are not part of the transport configuration of the package. Staff finds acceptable to remove Item 11 from Drawing No. 105E9722, sheet 2, and Item 13 from Drawings Nos. 105E9722, 166D8138, and 105E9713.

The applicant also requested to remove the requirement to perform a thermal survey prior to every shipment. The current operating procedures of the package required temperature measurements at various locations on the package until two consecutive readings, taken at least five minutes apart, showed a temperature difference of less than 3°F. The thermal measurement test had for objective to demonstrate compliance with 10 CFR 71.43(g). The staff reviewed the requirement and confirmed that compliance had already been demonstrated in Table 3-3, "Maximum Temperature Summary – NCT all models," of the application. Therefore, the staff finds the removal of this additional testing requirement to be acceptable. As such, there is no effect on package performance.

The amendment request included a revision of the melting point of the shoring material for Co-60 in metallic form and Cs-137 as cesium chloride. Condition No. 11 of the CoC stated: "Appropriate shoring devices, to secure and immobilize inner containers, must be comprised of materials compatible with the radioactive contents and the cask cavity materials. All shoring materials within the cavity must have a melting point greater than 900°F." The applicant explained that a melting point greater than 900°F precludes the use of lead and lead alloys in the cavity of the package. Since the lead, for which no credit is taken, is not required for shielding purposes, lowering the melting point from 900°F to 600°F would allow shipment of Co-60 and Cs-137 sources in a housing that may contain lead. The applicant further explained that the thermal analysis shows a maximum cavity temperature inside the package of 499°F and a maximum shielding temperature of 504°F, at 0.7 hour and 0.6 hour respectively, after the start of an hypothetical fire for the Model No. AOS-050A package. The maximum calculated cavity and shielding temperatures for all package models are presented below:

Model	Maximum Cavity Temperature	Maximum Shield Temperature
AOS-025A	277°F	276°F
AOS-050A	499°F	504°F
AOS-100A; AOS-100A-S	476°F	475°F
AOS-100B	467°F	467°F

Staff finds reasonable to approximate the package cavity temperature with the temperature of the shoring materials and finds there is a sufficient margin of safety, i.e., 101°F, by setting the minimum melting point of the shoring material at 600°F for a maximum hypothetical accident fire temperature of 499°F.

The amendment request also added a Chapter 9 to the application that includes the applicant's and the IAEA requirements, and the US NRC approval of the applicant's QAP, dated January 21, 2011. The staff has no objections to this addition.

The staff reviewed the changes requested by the applicant, and finds that they do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

CONDITIONS

The conditions specified in the Certificate of Compliance No. 9316 have been revised as indicated below:

Condition No. 5.(a)(3) was revised to update the drawings to their current revisions.

Condition No. 11 was revised to lower the melting point of the shoring material to 600°F when contents are Co-60 in metallic form or Cs-137 in the form of cesium chloride.

Condition No. 15 was revised to authorize use of Revision No. 3 of the certificate for approximately one year.

The expiration date of the certificate was not changed.

The References section of the certificate was updated to include the amendment request dated May 6, 2015, supplemented June 12, 2015.

CONCLUSION

Based on the statements and representations contained in the application, as supplemented, and the conditions listed above, the staff concludes that the design of the Model Nos. AOS-25A, AOS-50A, AOS-100A, AOS-100B, and AOS-100A-S packages has been adequately described and evaluated.

The staff concludes that the changes indicated do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9316, Revision No. 4.