February 1, 2011

MEMORANDUM TO: Doug Weaver, Deputy Director
Licensing and Inspection Directorate
Division of Spent Fuel Storage and Transportation, NMSS

FROM: Pierre Saverot, Project Manager **/RA/**
Licensing Branch
Division of Spent Fuel Storage and Transportation, NMSS

SUBJECT: SUMMARY OF JANUARY 18, 2011, MEETING WITH AOS

PURPOSE

On September 14, 2009, Alpha-Omega Services, Inc. (AOS) submitted an application for approval of the Model Nos. AOS-025, AOS-050, and AOS-100 packages. Although this is a high priority application, AOS requested several schedule extensions to respond in October 2010 to the first round of Request for Additional Information (RAI) letter dated December 24, 2009. This meeting was set up to provide AOS the opportunity to present proposed responses to the second round of staggered RAIs that were submitted in December 2010, for all technical disciplines except structural.

MEETING SUMMARY

Staff said that AOS will have to show a good faith effort in providing a high quality revised application, including complete and satisfactory responses to staff's second round of RAIs, prior to staff evaluating an extension request for their expired package (Docket No. 71-5979). Staff told AOS that it will set up both a conference call in February 2011 to verify the progress made on AOS RAI responses and a second face to face meeting also in February to deal with the structural RAIs, which were not finalized at the time of this meeting.

Staff discussed technical issues on the structural evaluation of the package. Staff obtained clarification on the availability of the LIBRA code and how stresses are derived. Staff mentioned it would have expected the use of a recognized code such as LS-DYNA for this application. AOS answered that staff should be able to duplicate all processes because the manual for the LIBRA code was provided to staff. Regarding Section No. 2.5.3.2 of the application, staff said that a common mistake made by applicants (including AOS) is to perform the personal barrier analysis only for a combined 10 g while it really needs to be done for all three components as vectors (5 g lateral, 2 g vertical and 3 g longitudinal). Staff also asked why there was no "center of gravity over corner" drop test or analysis in the application and AOS responded that it did not think that it was the worst case scenario. Staff reminded AOS that every assumption needs to be justified in the application.

Regarding the bolting analysis, staff said that the bolt closure region must remain elastic (under hypothetical accident conditions) for leak test purposes and that this has to be shown by

analysis, not by using NUREG-6007. Staff reminded AOS that such information must be in the structural chapter, not in the containment chapter of the application, and that it will need to verify the contour plots of the cross-sections to check that the region is elastic. Staff asked AOS why the effects of gaps on the bolt closure lid were not investigated since gaps – between contents and the structural lid - drastically increase bolt forces. Staff will forward a PATRAM paper on this topic and AOS will prepare its response and perform any required evaluation.

Staff also asked AOS why no crush test (or crush analysis) was performed for the AOS-025 package which weighs less than 500 kg and must be subjected to a crush test per 10 CFR Part 71 regulations. Staff also noted that (i) the puncture test analysis was not conducted for the maximum weight of the package, (ii) there were discrepancies in the load combination, (iii) the effect of hypothetical accident conditions was not analyzed on the impact limiter components, (iv) a rational basis for the selection of different foams for different packages must be included in the application, (v) the analysis of the performance of the turnbuckles under hypothetical accident conditions should be provided in the application, and (vi) several components appeared to have been misclassified as Category C in the drawings.

The thermal, containment, and materials RAIs were then reviewed and AOS presented their proposed responses (see Enclosure 2.) RAI No. 13, related to Section No. 3.5.6 of the application, generated a lot of interactions and discussions. Specifically, staff requested AOS to address the temperatures of the contents, of the basket, and shielding liner plates that have not been modeled due to the assumption of uniform decay heat to the cavity walls. Staff believes that the temperature of the contents is underestimated and requested AOS to perform a sensitivity analysis including an evaluation of predicted temperatures and pressures. AOS responded that (i) metallic contents are “not a package problem,” (ii) it is important to ensure that the internal pressure of the package is not increased, and (iii) the shipper has to do the analysis of the temperatures to comply with the certificate. Staff also requested a more detailed description of the contents and shoring materials - including their chemical and physical form, as well as their arrangement - in order to resolve potential concerns related to galvanic and chemical interactions. This topic will be addressed again at the next meeting between AOS and staff.

Staff provided comments on AOS proposed responses, e.g., underwater package loading requires vacuum drying, specifications are needed for any shoring material that cannot withstand a temperature of 1000ºF, “Alloy 90” is too general for a specification, etc., and will send AOS an example of a containment boundary from another application if it is publicly available.

The staff did not make any regulatory commitments at the meeting.

Docket No. 71-9316
TAC No. L24353

Enclosures: 1. List of Meeting Attendees
2. AOS Presentation

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Distribution: SFST r/f NMSS r/f NRC Attendees
G:/SFST/Saverot/71-9316 AOS/AOS Meeting January 18, 2011.doc.
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| **OFC** | SFST | E | SFST | C | SFST | | | |
|---|---|---|---|---|---|---|---|---|
| **NAME** | PSaverot | | MDeBose | | MSampson/P.Saverot | | | |
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C=Without attachment/enclosure E=With attachment/enclosure N=No copy

**Meeting Between Alpha-Omega Services, Inc.**
**And The**
**Nuclear Regulatory Commission**
**January 18, 2011**
**Meeting Attendees**

## NRC/NMSS/SFST

| | |
|---|---|
| Chris Bajwa | 301-492-3333 |
| Robert Johnson | 301-492-3175 |
| Patrick Raynaud | 301-492-3218 |
| Pierre Saverot | 301-492-3408 |
| JoAnn Ireland | 301-492-3309 |
| John Vera | 301-492-3372 |
| Sara DePaula | 301-492-3225 |
| Gordon Bjorkmann | 301-492-3298 |

## AOS

| | |
|---|---|
| Troy Hedger | 562-804-0604 |

## GEH/GNF

| | |
|---|---|
| Earl Saito | 910-819-5165 |
| Charles Vaughan | 910-540-7618 |
| Andy Langston | 910-819-5433 |
| Mike Schrag | |
| Earl Dulovsky | |

Enclosure 1