

August 17, 2006

Mr. Cary Hedger  
President  
Alpha-Omega Services, Inc.  
9156 Rose Street  
Bellflower, CA 90706

SUBJECT: NUCLEAR REGULATORY COMMISSION (NRC) INSPECTION REPORT NO.  
71-0086/2006-201

Dear Mr. Hedger:

This refers to the inspections conducted April 10-13, 2006, at the Ranor, Inc. (Ranor), facilities in Westminster, MA, and July 24, 2006, at the Alpha-Omega Services, Inc. (AOS) office in Bellflower, CA. Ranor is the contracted fabricator for a new transportation package for AOS designated as Model No. AOS-165. The inspections were conducted to determine if preapplication design and fabrication activities were being performed in accordance with the requirements of 10 CFR Parts 21 and 71, and AOS's NRC-approved quality assurance program. The inspection at the AOS office on July 24 was conducted to resolve issues noted during the inspection activities at the Ranor facilities. The enclosed report presents the results of this inspection.

The NRC staff assessed that AOS should take additional action to better ensure that controlling procedures are effective and that suppliers are adequately evaluated for both preapplication and production activities. AOS revised the design control procedure after the issue was identified by the NRC in April 2006, but had not yet developed the process for acceptance review. These procedural and design controls would need to be in place and effective to support the case that packagings comply with the Certificate of Compliance for the new AOS packaging, if it is approved.

No response to this letter is required, but any actions you may take to respond to the concerns will be subject to future NRC inspections. In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide

C. Hedger

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Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

Sincerely,

***/RA/***

Robert J. Lewis, Chief  
Transportation and Storage Safety and  
Inspection Section  
Spent Fuel Project Office  
Office of Nuclear Material Safety  
and Safeguards

Docket No. 71-0086

Enclosure: NRC Inspection Report No. 71-0086/2006-201

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**U.S. NUCLEAR REGULATORY COMMISSION  
Office of Nuclear Material Safety and Safeguards  
Spent Fuel Project Office**

**Inspection Report**

Docket: 71-0086

Report: 71-0086/2006-201

Certificate Holder: Alpha-Omega Services, Inc.  
9156 Rose Street  
Bellflower, CA 90706

Fabricator: Ranor, Inc.  
Bella Drive  
Westminster, MA 01473

Inspection Dates: April 10-13, 2006 (Westminster, MA)  
July 24, 2006 (Bellflower, CA)

Inspection Team: Frank Jacobs, Team Leader, Spent Fuel Project Office (SFPO)  
Clyde Morell, ATL International (April 10-13, 2006)  
Robert Temps, Inspector, SFPO (July 24, 2006)

Approved by: Robert J. Lewis, Chief  
Transportation and Storage Safety  
and Inspection Section  
Spent Fuel Project Office  
Office of Nuclear Material Safety  
and Safeguards

## **EXECUTIVE SUMMARY**

Nuclear Regulatory Commission (NRC) Inspection Report 71-0086/2006-201

Alpha-Omega Services, Inc. (AOS) is an NRC 10 CFR Part 71 Certificate of Compliance (CoC) holder (No. 71-5979) and is developing a new transportation package designated as Model No. AOS-165. AOS is applying their NRC-approved quality assurance (QA) program as a Type B CoC holder, to the development activities for the new package design. From April 10 through April 13, 2006, and on July 24, 2006, an inspection team from the Office of Nuclear Material Safety and Safeguards, Spent Fuel Project Office (SFPO), performed an inspection of selected preapplication design and fabrication activities for the new transportation package design. The team inspected the design and fabrication activities to determine if they were being performed in accordance with the requirements of 10 CFR Parts 21 and 71, and AOS's QA program.

At the time of the inspection at the Ranor facilities, no actual fabrication had yet been performed. The team evaluated selected areas of management controls, and evaluated control of the fabrication process through observations, examination of documents and records, and personnel interviews in the areas of material procurement, fabrication and assembly, and test and inspection.

In the area of management controls, the team assessed that AOS's actions to ensure that controlling procedures are effective and the qualification of suppliers is adequate, without supplementation, would not result in compliance with 10 CFR Part 71 for the new CoC design, if approved.

In the area of design controls, AOS procedures were revised subsequent to the NRC comments during the April 2006 inspection to provide a process for controlling the package design following NRC approval.

In the area of fabrication controls, AOS revised a procedure to better control changes to purchase orders after the April 2006 inspection. AOS acknowledged that a procedure to provide a process or criteria for final acceptance of the Certificate of Compliance and completed packagings still must be developed.

## **INSPECTION PROCEDURES USED**

IP 86001, "Design, Fabrication, Testing, and Maintenance of Transportation Packagings"  
NUREG/CR 6314, "Quality Assurance Inspections for Shipping and Storage Containers"  
NUREG/CR 6407, "Classification of Transportation Packaging and Dry Spent Fuel Storage System Components According to Importance to Safety"  
Reg Guide 7.10, "Establishing Quality Assurance Programs for Packagings Used in the Transport of Radioactive Material"

## LIST OF ACRONYMS USED

AOS	Alpha-Omega Services, Inc.
ASL	Approved Supplier List
ASME	American Society of Mechanical Engineers
CAR	Corrective Action Report
CFR	Code of Federal Regulations
CoC	Certificate of Compliance
GE	General Electric
IPL	The IPL Group, LLC
NDE	Nondestructive Examination
NRC	U.S. Nuclear Regulatory Commission
QA	Quality Assurance
Ranor	Ranor, Inc.
RT	Radiographic Test
SAR	Safety Analysis Report
SFPO	Spent Fuel Project Office
VNC	General Electric Company, Vallecitos Nuclear Center
WPS	Welding Procedure Specification

## PERSONS CONTACTED

The team held an entrance meeting at the Ranor facility on April 10, 2006, and at the AOS offices on July 24, 2006, to present the scope and objectives of the NRC inspection. On April 13, 2006, and July 24, 2006, the team held exit meetings at Ranor and AOS, respectively, to present the preliminary results of the inspection at each location. The individuals present at the entrance and exit meetings are listed below in Table 1.

Table 1  
Entrance and Exit Meetings Attendance

NAME	AFFILIATION	RANOR ENTRANCE	RANOR EXIT	AOS ENTRANCE	AOS EXIT
Frank Jacobs	NRC	X	X	X	X
Robert Lewis	NRC			X	X
Robert Temps	NRC			X	X
Sheila Ray	NRC			X	X
Clyde Morell	ATL International	X	X		
Cary Hedger	AOS			X	X
Troy Hedger	AOS	X	X	X	X
Bob Robnett	AOS	X	X	X	X
David Turner	VNC	X			
Raul Pomares	VNC	X	X		
Paul Watts	Ranor, Inc.	X	X		

## REPORT DETAILS

### 1. Background and Inspection Purpose

AOS is developing a new transportation package designated as Model No. AOS-165. AOS contracted General Electric Company (GE), Vallecitos Nuclear Center (VNC) to design the AOS-165. AOS and VNC have met with the NRC regarding the design approach and proposed testing methods for the AOS-165 package design, but an application has not been submitted as of the time of this inspection. AOS stated its intentions to use the AOS-165 prototype unit for the package evaluation required by 10 CFR 71.35.

The purpose of the inspection was to assess AOS's compliance with 10 CFR Parts 21 and 71, and to determine whether the design and fabrication activities for the Model No. AOS-165 transportation package were in accordance with AOS's NRC-approved QA program. The team observed selected activities; reviewed procedures and instructions; examined documents, records, and drawings; verified personnel training and qualifications; and interviewed personnel responsible for various activities.

### 2. Management Controls

#### 2.1 Scope

The inspection team evaluated selected areas of management controls through observations, examination of documents and records, and personnel interviews.

#### 2.2 Observations and Findings

##### 2.2.1 Commercial Grade Dedication

The inspector reviewed Ranor procedure RQAP-7.3, Revision 3, "Dedication of Commercial Grade Items for Use in Nuclear Grade Applications," and records for two purchases of commercial grade items (Keenserts), and determined that Ranor had correctly dedicated them for use on the AOS-165.

##### 2.2.2 Part 21

The inspector noted that the applicability of 10 CFR Part 21 was specified in AOS purchase orders P.O. # AOS-3302, dated March 28, 2005, issued to VNC for design, licensing, and management services, and P.O. # AOS-3566, dated December 14, 2005, issued to Ranor for fabrication of the prototype AOS-165 packaging.

##### 2.2.3 Audit Program

The inspector reviewed the Supplier Self Audit forms provided by AOS to VNC and Ranor for completion. The forms were intended to address the 18 criteria of 10 CFR Part 71, subpart H. The completed forms were reviewed and approved by the AOS Director of Regulatory Affairs and Quality on March 17, 2005. Onsite verification was performed by AOS at Ranor and VNC on March 29, 2006, and April 4, 2006, respectively. One nonconformance, for not following procedure, was identified at VNC concerning bolts in controlled material storage without acceptance stickers. The quality assurance manuals for VNC and Ranor were reviewed by AOS and no problems were found.

AOS added The IPL Group, LLC (IPL), to its Approved Supplier List (ASL) for the purpose of performing various surveillance activities during the fabrication and testing of the AOS-165 packaging. The inspector reviewed the documentation providing the basis for the qualification of IPL, and found that AOS had not used a procedure or checklist of criteria for evaluating IPL. The team noted that any reliance by AOS on the activities performed by a contractor to assure quality, as required by Part 71, would require documentation of an appropriate evaluation and qualification of that contractor by AOS. The team discussed with AOS the requirements of Part 71 for qualifying any entity providing materials or services affecting quality, and how timely and adequate qualification of AOS suppliers is necessary to support the fabrication and testing that will be used as the basis for the package application.

The inspector reviewed the AOS ASL and observed that the ASL did not identify the specific activity for which each listed supplier was approved, e.g., the type of material or type of service to be provided. Also, the period of approval or due date for the next audit or review was not indicated. While that information might be obtainable from other records, the inspector discussed how such information on the ASL would provide a more effective management tool and reduce the potential for nonconformances in procurement activities. AOS stated that “safety-related” suppliers were approved for a one-year period, and “others” for three years, but this was not specified in a procedure. AOS stated the procedure would be changed.

The team assessed that AOS, since the last NRC inspection, has made incremental improvements in its qualification and control of suppliers, but additional action needs to be taken to ensure controlling procedures are effective and the qualification of current and future suppliers is adequate.

### 2.3 Conclusions

In the area of management controls, the team assessed that AOS’s actions to ensure that controlling procedures are effective and the qualification of suppliers is adequate, without supplementation, would not result in compliance with 10 CFR Part 71 for the new CoC design, if approved.

## **3. Design Controls**

### 3.1 Scope

The inspection team reviewed AOS procedures and the contractual documents specifying requirements imposed on VNC for design, licensing, and management services. Actual design work performed by VNC was not in the scope of the inspection.

### 3.2 Observations and Findings

The inspector reviewed AOS purchase order P.O. # AOS-3302, dated March 28, 2005, issued to VNC for design, licensing, and management services as delineated in “Agreement between General Electric Company and Alpha-Omega Services, Inc. regarding Design and Licensing of a Transport Package for Type B Radioactive Materials,” dated February 23, 2005. The Agreement specified that VNC shall design the packaging, prepare the Safety Analysis Report (SAR), prepare the engineering specification for testing, manage testing activities, prepare the fabrication specification, and manage fabrication activities. VNC deliverables were the SAR, operations and maintenance manuals, fabrication specifications, fabrication records, quality records, and drawings and fabrication specifications to allow required manufacturing, maintenance, inspections, and anticipated repairs. VNC was to perform all work in accordance

with General Electric Quality Assurance Program (QAP-1), NRC docket number 71-0170. The Agreement also stated VNC shall create and issue a Project Plan to outline program objectives, schedules, personnel responsibilities, and execution.

During the April 2006 inspection, the inspector noted that AOS procedures did not provide a process for controlling the design of an NRC-approved cask design and would not be adequate following the issuance of the Certificate of Compliance for the AOS-165 to AOS. Subsequent to the NRC comments, AOS issued Revision B to PR 9003, "Package Design Control," to provide sufficient design control should design changes be required following NRC approval of the design and AOS receipt of the Certificate of Compliance.

### 3.3 Conclusions

In the area of design controls, AOS procedures were revised subsequent to the NRC comments during the April 2006 inspection to provide a process for controlling the package design following NRC approval.

## 4. **Fabrication Controls**

### 4.1 Scope

The inspection team evaluated control of the fabrication process through observations, examination of documents and records, and personnel interviews in the areas of material procurement, fabrication and assembly, and test and inspection. At the time of the inspection at the Ranor facilities, no actual fabrication had been performed. Material procurement and other preparations for fabrication had commenced.

### 4.2 Observations and Findings

#### 4.2.1 Material Procurement

The inspector reviewed the Ranor purchase order to Energy and Process for the inner and outer shell castings. Energy and Process was on Ranor's Approved Supplier List. P.O. Number 106967 had an order date of 12/19/05 and revisions on 1/23/06 and 4/7/06. Change Order 2, dated 4/7/06, referenced GE specification 22A9418 with no revision number and then with Revision 0. On 3/24/06 and prior to Change Order 2, specification 22A9418 had been revised to Revision 1 to add ASME SA-479, SA-564, and an acceptance standard for Nondestructive Examination (NDE). Ranor stated that Change Order 3 would be issued to P.O. 106967 to reference Revision 1 of specification 22A9418.

#### 4.2.2 Fabrication and Assembly

The "Agreement between General Electric Company and Alpha-Omega Services, Inc. regarding Design and Licensing of a Transport Package for Type B Radioactive Materials," specified that AOS shall contract with qualified vendors for fabrication and testing. The inspector reviewed AOS purchase order P.O. # AOS-3566, dated December 14, 2005, issued to Ranor for fabrication of the prototype AOS-165 packaging in accordance with GE Nuclear Energy Spec: 22A9418 Rev. 0. P.O. # AOS-165 referred to superceded P.O. # AOS-3300 regarding the role of VNC as agent for AOS. During the April 2006 inspection, AOS was revising the purchase order to reflect a change to Rev. 1 of specification 22A9418, and to eliminate the reference to P.O. #AOS-3300. The date on the pending purchase order was the same as the date on the original purchase order and there was no indication of the revision

sequence. The inspector noted that AOS procedure PR 9004, "Procurement Document Control & Purchased Material, Equipment, and Services Control," Revision A, required that all purchase orders and pending purchase orders will contain a revision or issue number, if applicable. However, AOS stated that the requirement was intended to apply to the specification of purchased parts. AOS stated they had identified prior to the start of the inspection that AOS procedures did not adequately control changes to purchase orders, and that procedure changes were necessary. AOS issued Revision B to PR 9004. During the July 2006 inspection, the inspector reviewed purchase order revisions issued subsequent to Revision B and observed that the new format clearly identified the sequence and purpose of all changes.

The inspector reviewed portions of the project plan "Design and Licensing of a Transport Package for Type B Radioactive Materials, EP 05001 Revision 2, April 2006." EP 05001 detailed that VNC shall manage the fabrication activities, including all QA coverage, of the packaging prototype.

The inspector reviewed portions of the fabrication specification Spec. No. 22A9418, Revision 1, "Alpha Omega Services, Radioactive Material Transport Packaging Materials and Fabrication Specification." Paragraph 4.1 of Spec. No. 22A9418 stated "...GE is responsible for compliance with all of the requirements set forth in this specification and attached drawings and has the authority to direct and approve vendor activities as they relate to this fabrication. Deviation from these requirements shall be acceptable only with the written approval of GE, or its agent(s)." Attachment A provided the document submittal requirements for the cask and impact limiter suppliers. Attachment T provided the quality records list. The documents reviewed appeared to provide clear delineation of quality responsibilities and activities between AOS and VNC.

The inspector reviewed Welding Procedure Qualification Records and Welding Procedure Specifications (WPSs) that Ranor indicated were going to be used for fabrication of the AOS-165, and found that the documents were in compliance with American Society of Mechanical Engineers (ASME) Code Sections IX requirements.

The inspector reviewed a computer-generated "Qualified Welders Report" and "Welding Electrode Distribution List." The Welding Electrode Distribution List is used control the amount and type of welding electrodes issued to a welder for a specific job. It also provides objective evidence that the welder has welded using a specific WPS within the 6 months as required by ASME Section IX, QW-322. The inspector selected seven Ranor welder names from the Welding Electrode Distribution List and verified that they were currently qualified to weld to the WPSs specific to the fabrication of the AOS-165.

#### 4.2.3 Test and Inspection

The inspector reviewed the following procedures and found the procedures to be in compliance with ASME Section V and ASME Section III, Division I - Subsection NG, Article NG-4000 Fabrication and Installation, Paragraph NG-4400; and ASME Section III, Division 3 - Subsection WB, Article WB-4000 Fabrication and Installation, Paragraph WB-4400:

- Procedure for Dye Penetrant Inspection, RQCP-9.4, Revision 5
- Procedure for Visual Inspection, RQCP-9.7, Revision 4
- Procedure for Weld Quality and Workmanship, AOS-WQWP-1, Revision 1.

The inspector reviewed Ranor qualification records for one Level III and one Level II NDE personnel and found the qualifications to be in compliance to American Society of Nondestructive Testing ASNT-TC-1a recommended practices.

The inspector observed the review of radiographic film for acceptance of the outer and inner shell castings fabricated by a Ranor supplier. The review was performed to assure compliance with ASME Code Section III Division 1, Paragraph NB 2575, GE Specification 22A9418, and Ranor Specification Section 5.3 and Subsections 5.2.1 and 5.2.3. The Ranor Level III had conducted his review of the radiographic film in accordance with Ranor procedure RQCP-9.4 prior to the inspection. The inspector observed the VNC Level III conduct his review. After completion of the review, the Ranor and VNC reviewers compared their findings and rejected the radiographic test (RT) inspection report based on (1) poor workmanship regarding the application of the RT film, and (2) failure to radiograph 100% of the castings surfaces as required by ASME Section III Section NB-2575. Ranor initiated Nonconformance Report 06-071 in accordance with procedure RQAP-15.1, Revision 3, to document the rejection of the RT inspection performed. In addition, Ranor issued a Corrective Action Report in accordance with procedure RQAP-16.1, Revision 3, to require the casting supplier to conduct a review and apparent cause of past NDE inspections performed by their testing service. Ranor directed the casting supplier to ship the castings to Ranor, where Ranor planned to have a local NDE inspection firm reinspect the castings.

Paragraph 15 of the AOS.GE Agreement stated that the final acceptance of the Certificate of Compliance shall take place at AOS's site following delivery of the completed basic packaging by GE to AOS at VNC. The inspector noted that AOS procedure PR9004 does not address acceptance criteria for procured material. AOS acknowledged that a procedure must be developed to provide a process or criteria for final acceptance in a timeframe to support receipt of the Certificate of Compliance and completed packagings.

#### 4.3 Conclusions

In the area of fabrication controls, as discussed with the inspector during the April 2006 inspection, AOS revised a procedure to better control changes to purchase orders. AOS acknowledged that a procedure to provide a process or criteria for final acceptance of the Certificate of Compliance and completed packagings still must be developed.

### **5. Exit Meetings**

Exit meetings were conducted by the team on April 13, 2006, and July 24, 2006. The team's preliminary findings and assessments were presented at the meetings. AOS personnel at the meetings acknowledged the team's findings and did not state any disagreement with the preliminary findings and their characterization.