October 31, 2012

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

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE MODEL NOS. AOS-25A, AOS-50A, AOS-100A, AOS-100B, AND AOS-100A-S PACKAGES

Dear Mr. Hedger:

By letter dated August 7, 2012, Alpha-Omega Services, Inc. (AOS) submitted an amendment request to Certificate of Compliance No. 71-9316 for the Model Nos. AOS-25A, AOS-50A, AOS-100A, AOS-100B, and AOS-100A-S packages.

In connection with the staff's review of the application "AOS Radioactive Material Transport Packaging System Safety Analysis Report," Report No. AOS-FM9054, Revision No. G, dated July 27, 2012, we need the information identified in the enclosure to this letter. We request that you provide this information by November 26, 2012. If you are unable to meet this deadline, you must notify us in writing no later than November 21, 2012, of your submittal date and the reasons for the delay. The staff will then assess the impact of the new submittal date and notify you of a revised schedule.

Please reference Docket No. 71-9316 and TAC No. L24677 in future correspondence related to this request. 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) 492-3408.

Sincerely,

/RA/

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

Docket No. 71-9316
TAC No. L24677

Enclosure: Request for Additional Information

Mr. Troy Hedger, CEO
Alpha-Omega Services, Inc.
9156 Rose Street
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In connection with the staff's review of the application "AOS Radioactive Material Transport Packaging System Safety Analysis Report," Report No. AOS-FM9054, Revision No. G, dated July 27, 2012, we need the information identified in the enclosure to this letter. We request that you provide this information by November 26, 2012. If you are unable to meet this deadline, you must notify us in writing no later than November 21, 2012, of your submittal date and the reasons for the delay. The staff will then assess the impact of the new submittal date and notify you of a revised schedule.

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Request for Additional Information
for the
Model Nos. AOS-25A, AOS-50A, AOS-100A,
AOS-100B, AND AOS-100A-S PACKAGES
Docket No. 71-9316

By application dated August 7, 2012, Alpha-Omega Services, Inc. (AOS) submitted an amendment request for the Model Nos. AOS-25A, AOS-50A, AOS-100A, AOS-100B, and AOS-100A-S packages.

This Request for Additional Information (RAI) identifies information needed by the staff in connection with its review of the "AOS Radioactive Material Transport Packaging System Safety Analysis Report for Model Nos. AOS-025, AOS-050, and AOS-100 Transport Packages," Report No. AOS-FM9054, Revision No. G, dated July 27, 2012. The requested information is listed by chapter number and title in the applicant's Safety Analysis Report. 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.

Chapter 1 – General Information

Licensing Drawings and Bill of Materials

1-1 Identify the specific changes that were made to the certificate drawings. Provide a table specifying which drawings were changed, which changes were made, and the justification for the change.

The application noted that changes to the drawings were a result of the inclusion of the cask lid elastomeric seal; the addition of a different metal alloy for certain components due to the procurement limitation of the originally selected alloys; minor dimension changes; and the reconfiguration of the central plug of the axial shielding plate for the AOS-100 model. Upon initial review, staff also identified changes due to adding or deleting items, such as those in certificate drawings 105E9722, 105E9711, and 183C8491. A complete understanding of the changes to the certificate drawings and any potential safety-significance of those changes is needed for staff to complete their review.

This information is required by staff to determine compliance with 10 CFR 71.33(a) and 71.35(a).

1-2 Clarify on the licensing drawings how the lid seals, including the metallic and the new elastomeric lid seal design, fit in the lid seal groove shown on the licensing drawings. Also clarify on the licensing drawings the lid seal groove location on the lid by providing

the inner and outer diameter of the lid seal groove, as well as specifications for straightness, roundness, flatness, and surface finish for the lid seal groove. Also provide complete design details and drawings for the new elastomeric lid seal design.

On licensing drawings 166D8143 (Section M-M compared to details H and N), 166D8147 (Section M-M compared to details H and I), and 105E9712 (Section M-M compared to details H and N, and Section AA-AA compared to details W and BB-BB), it appears that the width of the lid seal groove is significantly smaller than the dimension of the metallic seal and the dimension of the new elastomeric lid seal design and that lid seal groove would not be able to accommodate either the metallic seal or the new elastomeric lid seal design. Also the location and specifications of the lid seal groove has not been completely described on the licensing drawings. For the new elastomeric lid seal design, dimensions should be provided for the pseudo-groove materials as well as specifications for straightness, roundness, flatness, and surface finish, also ensure the materials for each individual component of the lid seal option have been completely described.

This information is required by staff to determine compliance with 10 CFR 71.33 and 71.51(a).

1-3 On licensing drawing 105E9719, Rev. F, Section B-B, show the bottom lid seal test port that is illustrated in Detail J. This test port is shown on Section B-B for the top lid seal.

The current Section B-B does not show the bottom lid seal test port, but that test port is necessary for leak testing the bottom lid seal.

This information is required by staff to determine compliance with 10 CFR 71.33.

1-4 Revise the licensing drawings to ensure that all containment boundary components are Safety Classification A.

For example, on licensing drawing 166D8143, Rev. F, item numbers 27 and 28, the port cover and O-ring are category B components, but it appears to the staff that those components could potentially be part of the containment boundary. The response to RAI 4-1 should be used in the development of the response to this RAI.

This information is required by staff to determine compliance with 10 CFR 71.101 and 71.107.

Chapter 2 – Materials Evaluation

2-1 Justify the unlimited use of the elastomeric seals based on the critical characteristics of the seals, including: compression and decompression characteristics over the operating temperature, springback adequacy, radiation resistance, and suitability for impact loads. Alternatively, define the useful life of the elastomeric seals for the AOS Transport Packaging System, considering the critical characteristics of the seals, expected and extreme operating temperatures, and maximum radiation exposure.

The elastomeric seals provide an essential safety function of the AOS Transport Packaging System, establishing and maintaining radioactive material containment.

In order to ensure that the containment boundary is maintained, degradation mechanisms must be appropriately addressed, such that the seals will be replaced before this safety function is compromised.

This information is required by the staff to determine compliance with 10 CFR 71.51(a).

2-2 Clarify the dynamic testing requirements for the impact limiter foam formulation. Specify how many samples will be tested and what the strain rate will be. Reference an appropriate testing standard or clarify the applicability of ASTM D1621-10.

Dynamic testing of the impact limiter foam is needed to ensure that the formulation results in material properties that are consistent with the properties used in the impact limiter structural analysis. This testing will define the correlation between the material response during dynamic loading and the material response during quasi-static batch and pour acceptance testing. ASTM D1621-10 specifies a crosshead displacement rate required to maintain quasi-static loading conditions. Quasi-static loading conditions are not applicable to the dynamic loading of interest.

This information is required by staff to determine compliance with 10 CFR 71.51.

Chapter 3 Thermal Evaluation

3-1 Provide the minimum and maximum allowable temperature limits for normal conditions of transport (NCT) and hypothetical accident conditions (HAC) for each material, including any adhesives if used, that is part of the new elastomeric lid seal design.

It is not clear from the licensing drawings how the new elastomeric lid seal has been assembled considering it is comprised of multiple materials. Allowable temperature limits for NCT and HAC for each material used in the new elastomeric lid seal design need to be provided for the staff to determine if the individual components of the new elastomeric lid seal design meet those limits. The staff acknowledges that minimum and maximum temperature limits have been provided in Chapter 3 of the SAR for the elastomeric seal material, but those limits may not be bounding for all materials that make up the new elastomeric lid seal design.

This information is required by staff to determine compliance with 10 CFR 71.51(a), 71.71 and 71.73.

3-2 Provide the temperature of the AOS100A-S bottom lid seal by specifically performing a thermal analysis for the AOS100A-S package under NCT and HAC conditions, or only use metallic lid seals for the top and bottom lid seals of the Model No. AOS-100A-S package.

The thermal model for the AOS-100A-S does not model the bottom lid or lid seal design. The maximum NCT and HAC temperature limits of the elastomeric lid seal are significantly lower than the maximum temperature limits of the metallic lid seal. In order to ensure containment is maintained the staff suggests performing a complete thermal analysis of the AOS-100A-S package under NCT and HAC conditions. Alternatively, only use metallic lid seals for both the top and bottom lid seals of the AOS-100A-S package.

This information is required by staff to determine compliance with 10 CFR 71.71 and 71.73.

Chapter 4 – Containment Evaluation

4-1 Draw the containment boundary in Figure 4-1 of the SAR to make a contiguous boundary that does not have any gaps. List all components that are part of the containment boundary in Section 4.1.1 of the SAR. Clarify if the inner or outer lid seals are part of the containment boundary in the metallic lid seal and new elastomeric lid seal design.

The staff notes that the containment boundary in Figure 4-1 stops at the lid inner seal and does not create a continuous boundary along the lid. There also appears to be multiple penetrations to the containment boundary that create gaps between components in the containment boundary. There should not be gaps in the containment boundary for the boundary to function properly. From Figure 4-1, it appears to staff the containment boundary components could potentially include the cask cavity shell, inner lid seal, cask lid, and the following from both the vent and drain port: conical seal, port plug, port plug seal, O-ring, and port cover. The new elastomeric lid seal option metal retainer rings may also be part of the containment boundary. The individual components that make up the new elastomeric lid seal need to be considered when determining which components of the design are part of the containment boundary. The staff and AOS need to clearly understand which components are part of the containment boundary to ensure containment is maintained.

This information is required by staff to determine compliance with 10 CFR 71.33 and 71.51(a).

4-2 Draw the containment boundary for each of the following package models: AOS-25, AOS-50, AOS-100A, AOS-100B, and AOS-100A-S.

Each model should have a clearly drawn containment boundary in Chapter 4 of the SAR. If the containment boundaries for the AOS-25A, AOS-50A, AOS-100A, and AOS-100B are determined to be similar/scaled (e.g., all containment boundary components are in the same location for each model and one model does not have different/additional containment boundary components from the others), briefly state that in Section 4.1.1 of the SAR and illustrate one containment boundary for that set of models. A separate figure should be drawn for the AOS-100A-S illustrating its containment boundary with a two lid design. The new elastomeric lid seal option metal retainer rings may also be part of the containment boundary. The individual components that make up the new elastomeric lid seal need to be considered when determining which components of the design are part of the containment boundary. The staff and AOS need to clearly understand which components are part of the containment boundary to ensure containment is maintained.

This information is required by staff to determine compliance with 10 CFR 71.33 and 71.51(a).

4-3 Provide design details and address concerns regarding the new elastomeric lid seal

design.

Typically a complete seal design can be referenced in a seal manufacturer catalog; in this case the new elastomeric lid seal appears to be a unique design. Typically a seal and groove combination is designed by a seal manufacturer after discussions with a customer based on the customer needs. The seal manufacturer for the entire new elastomeric lid seal design was not provided in this application. The materials for each individual component of the lid seal option have not been clearly described and the use of any adhesives has not been addressed. It is not clear if the seal has been designed for the lid groove or how it will interact with the lid groove. It is also not clear if the pseudo-groove, created by the metal retainer rings and the material between the silicone lid seals and on one side of the inner silicone seal, is appropriate for the silicone seals or how the pseudo-groove will interact with the silicone seals. It appears that the pseudo-groove design will possibly pinch or damage the seals during use. It is also not clear how the silicone lid seals can be visually inspected to ensure they are properly installed, secured, and free of defects due to the enclosure created by the rest of the new elastomeric lid seal design. These concerns above need to be addressed by the applicant.

This information is required by staff to determine compliance with 10 CFR 71.33 and 71.51(a).

4-4 Describe how the new elastomeric lid seal option is leak tested.

It is not clear to the staff if the new elastomeric lid seal option is designed to be leak tested.

On the licensing drawings there appears to be a solid material between the inner and outer lid seals and retainer rings. Also, the metal retainer rings and material on the inside edge of the inner seal appear to block the passage of the cavity gas to the inner seal such that those materials are also providing a seal-like containment function. Section 7.1.3.3.d of the SAR states, "… check the package containment, by sniffing with the test instrument, through the test port, the volume between seal O-rings and retainer rings (elastomeric seal) …" Leak testing is necessary to ensure containment is maintained.

This information is required by staff to determine compliance with 10 CFR 71.51(a) and 71.85(a).

4-5 Show how the new elastomeric lid seal design demonstrates compliance with the containment design criterion by proving that the new elastomeric lid seal design will hold together after closure and also prove that the new elastomeric lid seal design will remain leaktight during NCT and after HAC.

It is not clear to the staff if the flat metal retainer rings, the material between the two silicone lid seals, or the material on the inside edge of the inner seal could alter/impact the elastomeric seal properties including: compression and decompression characteristics over the operating temperature, springback adequacy, and suitability for impact loads, therefore the elastomeric lid seals will not remain leaktight after the lid bolts are torqued during closure. The staff needs to confirm that the application demonstrates that each package (AOS-25, AOS-50, AOS-100A, AOS-100B, and AOS-

100A-S) meets the containment requirements of 10 CFR 71.51(a)(1) under NCT.

If compliance is demonstrated by test, it must be verified that the leakage rate of a package subjected to the tests of 10 CFR 71.71 does not exceed the maximum allowable leakage rate for normal conditions. Scale model testing is not a reliable or acceptable method for quantifying the leakage rate of a full-scale package. If compliance is demonstrated by analysis, it must be verified that the structural evaluation shows that the containment boundary, seal region, and closure bolts do not undergo any inelastic deformation and that the materials of the containment system (e.g., seals) do not exceed their maximum allowable temperature limits when subjected to the conditions in 10 CFR 71.71. Demonstration that each package (AOS-25, AOS-50, AOS-100A, AOS-100B, and AOS-100A-S) meets the containment requirements of 10 CFR 71.51(a)(2) under HAC is similar to the above, except that the package should be subjected to the tests of 10 CFR 71.73 and the containment criterion is the maximum allowable leakage rate for HAC.

This information is required by staff to determine compliance with 10 CFR 71.51(a).

4-6 Clarify how the port plug / conical seal is attached to the cask cavity shell and if a torque value is necessary to ensure the port plug / conical seal remains attached and creates a leaktight containment boundary. If a torque value for the port plug / conical seal is necessary, that value should be specified on the licensing drawings for each model.

The port plug and conical seal penetrate the containment boundary. The staff needs to understand how the port plug / conical seal remains attached to the cask cavity shell and creates a leaktight containment boundary to ensure containment is maintained.

This information is required by staff to determine compliance with 10 CFR 71.51(a).

4-7 Describe how the lid bolt torque values calculated for the metallic lid seal will potentially impact the new elastomeric lid seal design. Describe the effects of applying too much torque to the lid bolts on the new elastomeric lid seal design and how this would impact the compression and decompression characteristics over the operating temperature, springback adequacy, and suitability for impact loads of the lid seal, and the overall containment performance of the elastomeric lid seal design during NCT and HAC.

The new elastomeric lid seal design (if it only contained an elastomeric seal, not including metal retainer rings or other material between the seals or to the side of the seals) would have significantly lower bolt torque values if they were calculated compared to a metallic seal. The impact of the significantly higher bolt torque value on the elastomeric lid seal design compression and decompression characteristics over the operating temperature, springback adequacy, and suitability for impact loads of the lid elastomeric seal design, as well as the impact on the overall containment performance of the elastomeric lid seal design during NCT and HAC has not been described. This is necessary to ensure containment is maintained. Alternatively, calculate the bolt torque values for the new lid elastomeric seal.

This information is required by staff to determine compliance with 10 CFR 71.51(a).

4-8 Describe how the vent port will adequately vent the package during vacuum drying.

Describe the orientation of the package in greater detail during the vacuum drying draining process in Chapter 7 of the SAR. Also clarify in Chapter 7 of the SAR the method of isolating the vacuum pump from the package to ensure the cask cavity remains at or below 1 torr, for at least 30 minutes to ensure water is removed from the package.

It is not clear to the staff if the vent port will function as intended due to what appears to be a restricted passage between the cask cavity shell and the lid plug assembly that can be seen on the licensing drawings. The orientation of the package should be described in greater detail during the draining process (i.e., top lid up). Also note that simply closing the valve between the package and the vacuum pump is not sufficient to isolate the vacuum pump from the package, as a faulty valve allows the vacuum pump to continue to draw a vacuum on the package. Turning off the pump, or opening the suction side of the pump to atmosphere are examples of ways to assure that the pump is not continuing to draw a vacuum on the package. This is necessary to ensure water is removed from the package.

This information is required by staff to determine compliance with 10 CFR 71.43(c) and (d).

Chapter 7 – Package Operations

7-1 Describe throughout Chapter 7 of the SAR how the AOS-100A-S dual lid design is operated.

It appears that the operating procedures in Chapter 7 of the SAR are not written for the AOS-100A-S dual lid design, but for the AOS models that have one lid. The staff needs to understand how the AOS-100A-S dual lid design is used during preparation for loading, loading of contents, preparation for transport, package unloading, preparation of empty package for transport, and other procedures. The staff also needs to ensure that ANSI N14.5 periodic, and pre-shipment leakage rate testing is performed on the second lid and containment boundary seal for the dual lid design to ensure containment is maintained.

This information is required by staff to determine compliance with 10 CFR 71.51(a), 71.85(a), and 71.87(a),(b),(c), and (f).

7-2 Clarify if the port plug / conical seal will be opened, removed, or replaced at any time during package operations. Also ensure the necessary ANSI N14.5 fabrication, maintenance, periodic, and pre-shipment leakage rate tests in Chapters 7 and 8 of the SAR are appropriate for those components or describe ANSI N14.5 fabrication, maintenance, periodic, and pre-shipment leakage rate tests for those components within Chapters 7 or 8 of the SAR.

The staff needs to ensure containment is maintained after opening, removal, and replacement of containment boundary components through the use of ANSI N14.5 leakage rate testing.

This information is required by staff to determine compliance with 10 CFR 71.51(a), 71.85(a), and 71.87(b) and (c).

7-3 Describe the inspection of the elastomeric O-rings in Sections 7.1.2.1.f and 7.1.2.1.g of the SAR

Section 7.1.2.1 of the SAR does not currently mention inspection of the containment boundary seals. Based on guidance from NUREG-1609, Section 7.5.1.2, in Sections 7.1.2.1.f and 7.1.2.1.g of the SAR add the following sentence, "Elastomeric O-rings shall be visually inspected for any cuts, blemishes, debris or permanent local deformation on the sealing surface and damaged seals shall be replaced." This sentence is suggested to ensure elastomeric O-rings are replaced if necessary in order to maintain containment.

This information is required by staff to determine compliance with 10 CFR 71.51(a), 71.85(a), and 71.87(b) and (c).

7-4 Reference the ANSI N14.5 maintenance and periodic leakage rate tests in Section 7.1.2.1 of the SAR

In Section 7.1.2.1 of the SAR the staff recommends adding the following sentences as Section 7.1.2.1.i of the SAR: "If a containment boundary seal is replaced or a containment boundary seal has not been leak tested within 12 months prior to the shipment, a helium leak test shall be performed in accordance with ANSI N14.5 maintenance and periodic leakage rate tests described in Section 8.2.2. Note: completion of a helium leak test does not relieve the need to perform the ANSI N14.5 pre-shipment leakage rate test in Section 7.1.3.3." This is necessary in order to ensure containment is maintained.

This information is required by staff to determine compliance with 10 CFR 71.51(a), 71.85(a), and 71.87(c).

7-5 Specify the helium backfill pressure for the cask cavity in Section 7.1.3.1.a.2.g.

The helium backfill pressure should be provided to ensure the maximum normal operating procedure is not exceeded during the vacuum drying process.

This information is required by staff to determine compliance with 10 CFR 71.33(b)(5).

7-6 In Section 7.1.3.3.d of the SAR specify that after a repair or replacement of suspected containment boundary component(s), re-test for leakage is done in accordance with Section 8.2.2 of the SAR to ANSI N14.5 leaktight criteria. Also specify in Section 7.1.3.3 that the pre-shipment leakage rate testing is performed in accordance with ANSI N14.5.

The staff needs to ensure retesting of repaired or replaced containment boundary elastomeric seals is not performed to the ANSI N14.5 pre-shipment leakage rate, but to ANSI N14.5 leaktight criteria. Also, Sections 7.1.3.3.c and 7.1.3.3.d of the SAR appears to be written in a manner that addresses the lid seal and should consistently address all containment boundary seals.

This information is required by staff to determine compliance with 10 CFR 71.51(a),

71.85(a), and 71.87(c).

Chapter 8 – Acceptance Tests and Maintenance Program

8-1 Clarify in Section 8.1.4 of the SAR that an ANSI N14.5 fabrication leakage rate test is performed on the entire containment boundary. That includes leakage rate testing of the base material, (e.g., cask cavity shell, cask lid(s)) and all containment boundary components. The fabrication leakage rate test also needs to be clearly described or referenced in Section 4.4 of the SAR, currently Section 4.4 of the SAR only references periodic and pre-shipment leakage rate testing. Also in Section 8.1.4, the use of the term maintenance leakage rate test to describe a test that occurs every 12 months is in disagreement with ANSI N14.5 and should be revised to state that it is a periodic leakage rate test.

Section 8.1.4 of the SAR should describe the ANSI N14.5 fabrication leakage rate test that is to be performed on the entire containment boundary to demonstrate that each packaging, as fabricated, provides the required level of containment. The fabrication leakage rate test should be performed prior to the first use of each packaging. This testing is necessary to ensure the required level of containment is provided. Section 8.1.4 of the SAR describes helium leakage rate testing at critical locations within the AOS Transport Packaging System including the cask lid seal joint, cask drain port, and cask vent port, which does not include the entire containment boundary. The fabrication leakage rate test should be referenced in Section 4.4 of the SAR.

Section 8.1.4 of the SAR also references a maintenance leakage rate test to describe a test that occurs every 12 months. The ANSI N14.5 maintenance leakage rate test is performed to confirm that maintenance, repair, or replacement of components has not degraded the containment system performance and is performed after maintenance repair, or replacement of components of a containment system. The ANSI N14.5 maintenance leakage rate test is performed on the portion of the containment system affected by the maintenance, repair, or component replacement. The leakage criteria for the ANSI N14.5 maintenance leakage rate test is a leakage rate less than the reference air leakage rate, in the case of the AOS packages, that would be leaktight as defined by ANSI N14.5. The ANSI N14.5 periodic leakage rate test is performed to confirm that the containment capabilities have not deteriorated over an extended period of use and is performed within 12 months prior to each shipment. The ANSI N14.5 periodic leakage rate test is performed on all containment boundary seals, closures, valves, rupture disks, etc. The ANSI N14.5 maintenance leakage rate test and periodic leakage rate test should be described in Section 8.2.2 of the SAR and referenced in Section 4.4 of the SAR.

This information is required by staff to determine compliance with 10 CFR 71.51(a), 71.85(a), and 71.87(c).

8-2 In Section 8.2.2 of the SAR describe the ANSI N14.5 maintenance leakage rate test.

Section 8.2.2 of the SAR describes or references ANSI N14.5 periodic and pre-shipment leakage rate tests, but does not describe the ANSI N14.5 maintenance leakage rate test. This test should be described in Section 8.2.2 of the SAR and referenced in Section 4.4

of the SAR. The ANSI N14.5 maintenance leakage rate test is performed to confirm that maintenance, repair, or replacement of components has not degraded the containment system performance and is performed after maintenance repair, or replacement of components of a containment system. The ANSI N14.5 maintenance leakage rate test is performed on the portion of the containment system affected by the maintenance, repair, or component replacement. The leakage criteria for the ANSI N14.5 maintenance leakage rate test is a leakage rate less than the reference air leakage rate, in the case of the AOS packages, that would be leaktight as defined by ANSI N14.5.

This information is required by staff to determine compliance with 10 CFR 71.51(a), 71.85(a), and 71.87(c).

8-3 State, in Section 8.2.2 of the SAR, that elastomeric seals should be replaced within the 12 month period prior to shipment and the maintenance leakage rate test should be performed after seal replacement.

NUREG 1609, Section 8.5.2.2, states that elastomeric seals should be replaced and leak tested within the 12 month period prior to shipment. This should be described in Section 8.2.2 of the SAR to ensure containment is maintained.

This information is required by staff to determine compliance with 10 CFR 71.51(a), 71.85(a), and 71.87(c).

8-4 Describe how helium permeation through the silicone seals will be addressed during all leakage rate testing to ensure accurate leakage rate testing.

ANSI N14.5-1997 Section B.11 states, “If a containment system includes elastomeric materials, such as rubber O-rings, permeation can be a problem when leakage test procedures are being used to demonstrate that the system is leaktight. The degree of permeation is affected by seal material, seal surface area, time, and temperature.” Methods for eliminating permeation as a factor in leakage rate are further discussed in Section B.11 of ANSI N14.5. The staff needs to understand how helium permeation through silicone will be addressed during leakage rate testing to ensure accurate leakage rate testing.

This information is required by staff to determine compliance with 10 CFR 71.51(a), 71.85(a), and 71.87(c).