ENERGY*SOLUTIONS*

September 20, 2013
ES/NRC 13-019
Docket No. 71-9168

ATTN: Document Control Desk
Director, Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: **Response to Request for Additional Information for the Model No. 8-120B Package, Docket No. 71-9168**

Reference: Letter from P. Saverot (NRC) to S. Sisley (Energy*Solutions*), "Request for Additional Information for the Model No. 8-120B Package, Docket No. 71-9168," September 16, 2013, ADAMS Accession Number ML13260A396.

Dear Sir or Madam:

By the referenced letter, NRC requested that Energy*Solutions* (ES) provide additional information needed for NRC staff to complete their review of the application to amend Certificate of Compliance (CoC) No. 9168 for the 8-120B Shipping Package. ES hereby provides the additional information requested by NRC in the referenced letter, as described in Enclosure 1. Enclosure 2 contains one (1) paper copy of the non-public version of the revised 8-120B Safety Analysis Report (SAR) that contains security-related sensitive information that should be withheld under 10 CFR 2.390. Enclosure 3 contains one (1) paper copy of the public version of the revised 8-120B SAR in which all proprietary information and security-related sensitive information is redacted. A summary of changes included in the 8-120B SAR is provided in Attachment 1 of this letter.

Should you or any member of your staff have questions, please contact the undersigned at (408) 558-3509.

Sincerely,

Steven E. Sisley
Cask Licensing Manager
Energy*Solutions*

Attachments:
(1) Summary of Changes, 8-120B Consolidated SAR, Revision 6 (2 pages)

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Enclosures:
1) Response to Request for Additional Information.
2) Safety Analysis Report for the Model 8-120B Type B Shipping Packaging, Consolidated Revision 6, September 2013, Non-Public Version (1 paper copy), **(Security-Related Information – Withhold Under 10 CFR 2.390).**
3) Safety Analysis Report for the Model 8-120B Type B Shipping Packaging, Consolidated Revision 6, September 2013, Public Version (1 paper copy).

cc
Mr. Pierre Saverot, Division of Spent Fuel Storage and Transportation
Mr. Dan Shrum, Energy*Solutions*

The following is a summary of the changes incorporated in Revision 6 of the 8-120B Consolidated Safety Analysis Report. The revisions indicators in the margins of Revisions 4 and 5 of the 8-120B Consolidated Safety Analysis Report have also been included in Revision 6 to indicate the cumulative changes that have been made in association with the request to amend the 8-120B CoC. However, the summary of the changes incorporated in Revisions 4 and 5 of the 8-120B Consolidated Safety Analysis Report are not repeated below.

Summary of Changes, 8-120B Consolidated SAR, Revision 6

Section	Page(s)	Change	Purpose
Table 4-2, Caption	4-22	Corrected to refer to 8-120B.	Editorial correction.
Table 4-2, Footnote **	4-22	Deleted note regarding exemption from pre-shipment leak testing requirement for LSA material and SCO shipments.	All shipments made in the 8-120B package now require pre-shipment leak testing.
5.1	5-1	Revised referenced procedure step in the last sentence of first paragraph.	Editorial correction.
5.7	5-18	Corrected revision number of Reference 5.7.2.	Editorial correction.
7.1.10 through 7.1.13	7-3, 7-4	Change step number from 7.1.9B to 7.1.10 and renumbered all subsequent steps accordingly.	Revised to avoid confusion since "A" steps are associated with loading through the cask secondary lid.
7.1.10	7-3	Revised second sentence and associated footnote.	Clarify conditions under which the requirement is waived and the basis for waiving the requirement.
7.1.14 through 7.1.21.5	7-4, 7-5	Change step number from 7.1.12A to 7.1.14 and renumbered all subsequent steps accordingly.	Revised to avoid confusion since "A" steps are associated with loading through the cask secondary lid.
7.1.14	7-4	Revised step and deleted note regarding exemption from pre-shipment leak testing requirement for LSA material and SCO shipments.	All shipments made in the 8-120B package now require pre-shipment leak testing.

Summary of Changes, 8-120B Consolidated SAR, Revision 6

Section	Page(s)	Change	Purpose
8.3.2.2.a	8-9	Deleted note regarding exemption from pre-shipment leak testing requirement for LSA material and SCO shipments.	All shipments made in the 8-120B package now require pre-shipment leak testing.
8.3.2.2.b	8-9	Added the required pre-shipment leak test pressure.	Editorial clarification.
8.3.2.2.d	8-9	Revised to clarify that the allowable pressure drop is 0.1 psig and that the maximum graduation (not sensitivity) of the pressure guage shall be 0.1 psig.	Editorial correction.

Enclosure 1

Responses to Request for Additional Information

(2 pages total)

The response to the NRC Request for Additional Information (RAI) associated with the Energy*Solutions* request to amend the Certificate of Compliance (CoC) for the Model No. 8-120B Shipping Package is provided herein. The NRC RAI question, which is shown in *italics*, is followed by the ES response and a summary of the resulting changes to the 8-120B Safety Analysis Report.

QUESTION:

During the review of your application for revision to Certificate of Compliance (CoC) No. 9168 for the Model No. 8-120B package, EnergySolutions submitted a notification, dated August 14, 2013, regarding the failure to observe CoC Conditions for the package vent port leak test hold time (ADAMS Accession Number ML13247A179).

In connection with this notification, we need you to (i) provide complete calculations for the test vent port volume used in the pressure drop test, (ii) clarify the volume (combined test manifold and small residual volume inside the vent port, or small residual volume inside the vent port) that is less than 34.4 cm^3, and (iii) also clarify if the value of 34.4 cm^3 is correct.

*Your notification states the following: "The vent port test volume (the staff interprets this to be the total of the test vent port volume and test manifold volume) is equal to the combined volume of the test manifold (10 cm^3) plus a very small residual volume inside the vent port (the staff interprets this to be the test vent port volume), which is less than 34.4 cm^3." However, you do not specifically state the value of the small residual volume inside the vent port or show how it was calculated. The calculation of the test vent port volume used in the pressure drop test is necessary to show that the test vent port volume in addition to the maximum test manifold volume (10 cm^3) is less than one third of the total of the primary containment seal test chamber volume and the maximum test manifold volume (20 min / 60 min * (103.2 cm^3 + 10 cm^3) = 37.3 cm^3), for the 20 minute hold time to be adequate. The staff calculated that the test vent port volume must be less than 37.3 cm^3 – 10 cm^3 = 27.3 cm^3 for the 20 minute hold time to be adequate.*

We need this information to determine compliance with 10 CFR 71.51(a)(1) and (2), and request that you provide this information by September 30, 2013. We do recognize that this calculation applies to the old lids, not to the new lids that will be used for all future shipments, but it is our intent to explain staff's position on leak testing in the Safety Evaluation Report pertaining to the amendment request currently under review.

RESPONSE:

Figure 1 shows the test manifold configuration used for the assembly verification leak test of the 8-120B vent port evaluated in Section 4.4 of the July, 2012 SAR Addendum. The vent port test flange is affixed to the lid, and the test manifold (partially shown in Figure 1) is screwed into the test flange. The volume of the test manifold, V_M, is required to be less than 10 cm^3.

The total vent port test volume equals $V_M + V_1 + V_2 - V_3$, where V_1 is the small volume inside the ∅3/8" threaded hole of the test port flange between the bottom end of the test manifold and the top plane of the lid, V_2 is the volume of the ∅1.25" x 3/8" deep countersunk hole in the lid

(sans bolt), and V_3 is the conservative lower bound estimate of volume of the vent port plug, i.e., the ½" hex cap screw head volume (calculated as a Ø3/4" x 5/16" high.) The volume of the vent plug Stat-O-Seal is conservatively neglected.

$$V_1 = 1/8 \text{ in} * \pi/4 * (3/8 \text{ in})^2 * (2.54 \text{ cm/in})^3 = 0.23 \text{ cm}^3$$

$$V_2 = 3/8 \text{ in} * \pi/4 * (1.25 \text{ in})^2 * (2.54 \text{ cm/in})^3 = 7.54 \text{ cm}^3$$

$$V_3 \approx 5/16 \text{ in} * \pi/4 * (3/4 \text{ in})^2 * (2.54 \text{ cm/in})^3 = 2.26 \text{ cm}^3$$

Therefore, the total vent port test volume, including the test manifold volume, is calculated to be 15.5 cm^3 (i.e., 10 + 0.23 + 7.54 – 2.26), which is much less than the 37.3 cm^3 limit calculated by the NRC staff. The lower vent port test volume limit of 34.4 cm^3 given in the referenced notification was based on a calculation that conservatively neglected the 10 cm^3 manifold volume. With the inclusion of the test manifold volume, we concur with the NRC staff's calculated vent port test volume limit of 37.3 cm^3 for the 20-minute hold time to be adequate.

Summary of SAR changes:

- None.

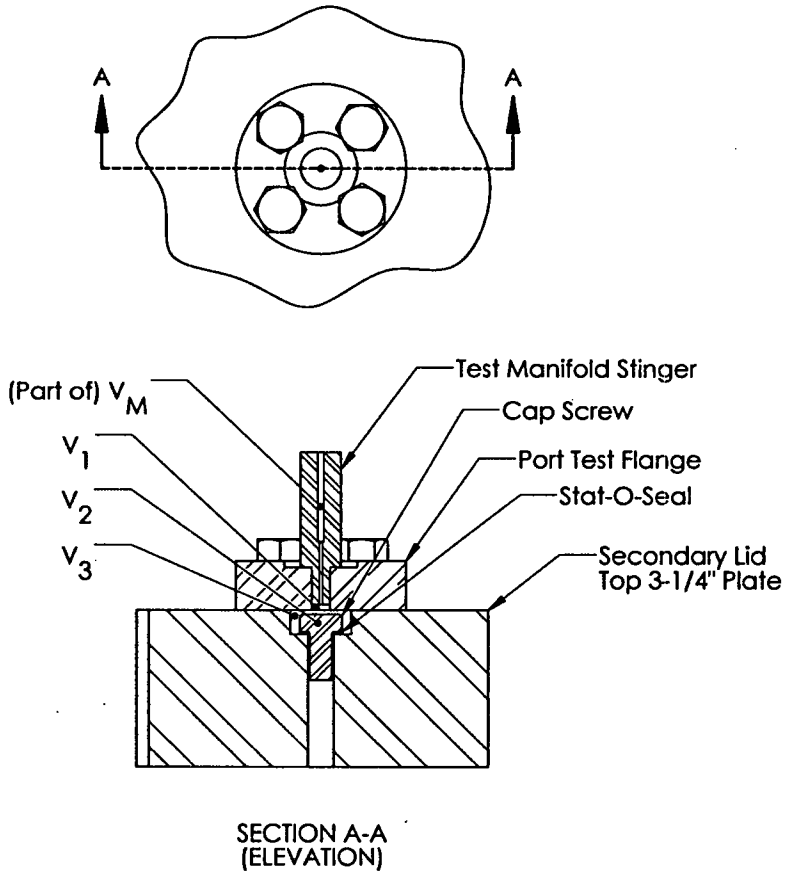

Figure 1 – Vent Port Test Configuration