



August 18, 2015

DPG 15-230

Mark Lombard
Director, Division of Spent Fuel Management
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington DC 20555-0001

ATTN: Document Control Desk

Subject: 10 CFR 71.95 Report on Energy Solutions 8-120B Casks

Reference: Energy Solutions letter to the NRC, dated June 24, 2015

Dear Mr. Lombard,

In accordance with 10 CFR 71.95(b), the Sacramento Municipal Utility District (SMUD) is submitting the attached report regarding instances where the conditions of the Certificate of Compliance for the 8-120B casks (Certificate of Compliance #9168) may not have been followed in making radioactive waste shipments. The circumstances described in this report are applicable to fourteen shipments SMUD made to Waste Control Specialists (WCS) in Andrews, Texas over a 5 month period in 2014.

If you have any questions requiring additional information or clarification, please contact David E. Koontz at 916-732-4850.

Sincerely,

A handwritten signature in black ink, appearing to read 'E. Ronningen'.

Einar T. Ronningen
Manager, Rancho Seco Assets

Attachment: ES-CD-O-2015-002, Letter from EnergySolutions to NRC 6/24/15

cc: NRC Region IV

NIMSSDI

Potential Failure to Comply with Certificate of Compliance Conditions for the 8-120B Cask Vent Port Pre-Shipment Leak Test

Abstract

On July 22, 2015, the Sacramento Municipal Utility District (SMUD) received an e-mail from EnergySolutions stating that conditions required by their Certificate of Compliance (C of C #9168) may not have been met when SMUD utilized the affected EnergySolutions casks in 2014. This information was provided as a copy of a report from EnergySolutions to NRC dated June 24, 2015 (attached) which outlines the circumstances of the condition.

The report stated that the period of non-compliance lasted from September 2013 through June 2015. During that period, SMUD rented two EnergySolutions 8-120B casks and used them to make fourteen Type-B shipments to Waste Control Specialists (WCS) in Andrews, Texas. The SMUD shipments occurred from July 21, 2014 through November 11, 2014. All of the 8-120B casks were satisfactorily leak tested prior to shipment in accordance with the EnergySolutions' Cask Book For Model 8-120B USA/9168/B(U), Revision 42.

In June 2014, EnergySolutions' instructors conducted training for SMUD radwaste handlers in the operation and handling of their 8-120B casks. The presence of the neoprene gasket was never mentioned during this training nor is there any reference to it in their Cask Book For Model 8-120B USA/9168/B(U), Revision 42. SMUD personnel observed the neoprene gasket at the bottom of the vent port hole while performing the steps in the section of the Cask Book titled Pressure Drop Test For Vent Port, Section 5.3, TR-TP-002, Revision 2. SMUD staff assumed that the gasket was part of the EnergySolutions' vent port design.

EnergySolutions' addition of the neoprene gasket to the bottom of the vent port hole may have prevented SMUD personnel from properly leak testing the vent ports of both of the rented 8-120B casks, as required by the C of C. No further action is deemed necessary by SMUD since we do not anticipate any future shipments using the 8-120B cask.

Narrative Description of the Event

1. Status of Components

SMUD radwaste handlers involved with preparing the radioactive waste shipments observed the neoprene gasket at the bottom of the vent port hole while performing Pressure Drop Test For Vent Port, Section 5.3, TR-TP-002, Revision 2. SMUD staff assumed that the gasket was part of the EnergySolutions vent port design. All of the 8-120B casks were satisfactorily leak tested prior to shipment and accepted by WCS without incident.

Potential Failure to Comply with Certificate of Compliance Conditions for the 8-120B Cask Vent Port Pre-Shipment Leak Test

2. Dates of Occurrence

SMUD conducted radioactive waste shipments from the Rancho Seco site to WCS in Andrews, TX from July 21, 2014 through November 11, 2014.

3. Cause of Error

As stated in their June 24, 2015 letter to the NRC, *EnergySolutions* found that the manifold had problems sealing with the vent port on the new 8-120B lids. They added an extra neoprene gasket to help reduce the false test failures. *EnergySolutions* did not realize that the gaskets had the potential to reduce the test sensitivity.

4. Failure Mode Mechanism, and Effects

As stated in the *EnergySolutions* letter to the NRC, the neoprene gasket can constrict the head of the vent port plug cap screw when it is compressed by the bottom of the test manifold stinger. This can reduce the sensitivity of the pre-shipment leak test. Consequently, the pre-shipment leak tests performed using the neoprene gasket may not have provided the required test sensitivity.

5. Systems or Secondary systems Affected

Not applicable

6. Method of Discovery of the Error

On July 22, 2015, SMUD received an e-mail from *EnergySolutions* stating that they had made modifications to their fleet of 8-120B casks that were not addressed in their Certificate of Compliance. *EnergySolutions* reported this situation to the NRC in a letter dated June 24, 2015.

7. Human Performance-Related Root Cause

Not applicable

8. Manufacturer and Model Number of Failed Component

8-120B radioactive waste shipping cask

9. Chemical and Physical Form of Package Contents

The packages contained Class B and C radioactive waste consisting primarily of activated metals and metal filters.

Potential Failure to Comply with Certificate of Compliance Conditions for the 8-120B Cask Vent Port Pre-Shipment Leak Test

Assessment of Safety Consequences

All of the 8-120B casks were satisfactorily leak tested prior to shipment in accordance with the EnergySolutions' Cask Book For Model 8-120B USA/9168/B(U), Revision 42. All of the shipments were accepted by WCS without incident. In no instance did the receipt surveys of the casks conducted at the WCS facility upon arrival of the transport containing the waste materials from Rancho Seco indicate the presence of external contamination. And, in no instance did the receipt surveys of the empty casks delivered to Rancho Seco indicate the presence of external contamination. Therefore, there was no evidence of migration of contamination from the interior to the exterior of the casks through the vent port while the casks were in use for the shipment of waste materials from Rancho Seco to the WCS facility.

Corrective Actions

All of the 8-120B casks were satisfactorily leak tested prior to shipment and accepted by WCS without incident. No further action is deemed necessary by SMUD since we do not anticipate any future shipments using the 8-120B cask.

Previous Similar Events

None

Contact Information

Dave Koontz
Senior Project Manager
Rancho Seco Nuclear Generating Station
Herald, CA 95638
916-732-4850

Exposure to Individuals to Radiation or Radioactive Materials

None

ENERGYSOLUTIONS

June 24, 2015
ES-CD-O-2015-002

Dear Valued Customer:

On Monday June 1, 2015, an 8-120B cask user identified a concern that the neoprene gasket could potentially affect the integrity of the vent port seal pre-shipment leak test. In response, EnergySolutions performed a series of tests that confirmed that the neoprene gasket can constrict on the head of the vent port plug cap screw when it is compressed by the manifold, resulting in a reduction of the test sensitivity. The amount of reduction of the test sensitivity cannot be determined for any particular shipment due to several reasons. It is uncertain whether, or by how much, the sensitivity of the vent port pre-shipment leak tests was reduced because: 1) Use of the gasket was optional- the gasket may, or may not have been in place for the tests, and 2) The force with which the gasket was compressed during testing is unknown, so it is uncertain if it caused the gasket to constrict onto the head of the vent port cap screw.

The gasket may have been used on as many as 100 shipments by EnergySolutions or its customers with EnergySolutions as the licensee from September 2013 through June 2015. It was September 2013 when newly designed lids were installed. The condition was determined not to have significant safety consequence because the seals receive periodic helium leak testing as required by the SAR, the vent ports are rarely opened, there is a margin of conservatism of approximately a factor of 9 on the prescribed vent port leak rate test, and there have been no observations of contamination around the vent port openings that would suggest leakage. There will be no further tests made using the gaskets since EnergySolutions has replaced all of the subject gaskets with a modified version that does not have the potential to reduce the test sensitivity.

EnergySolutions filed the attached report with the NRC containing the information required by 10 CFR 71.95 on June 24, 2015. In the report, EnergySolutions describes the cause of the discrepancy and provides information that supports that there is no safety significance. We expect that the information required for individual users to make their own notifications is contained in this report. Reference to this report in individual user reports would be appropriate if you so choose.

We sincerely apologize for any inconvenience this issue may have caused within in your organization. Our corrective actions as a result of this issue are intended to prevent recurrence of similar issues and to ensure the highest quality of products and services that we provide.

For additional details, please contact Aleksandr Gelfond at axgelfond@energysolutions.com or 803-591-9074.

Sincerely,



Mark S. Lewis
General Manager, Cask Logistics
Logistics, Processing and Disposal
EnergySolutions, LLC

Attachment: Letter and Report to NRC on 8-120B Cask

cc: Dan Shum
Aleksandr Gelfond

740 Osborn Road, Barnwell, South Carolina 29812
803.259.1781. Fax 803.259.1477

ENERGYSOLUTIONS

June 24, 2015

CD15-0149

Mark Lombard, Director
Division of Spent Fuel Management
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington DC 20555-0001

ATTN: Document Control Desk

Subject: 10 CFR 71.95 Report on the 8-120B Cask

Dear Mr. Lombard:

EnergySolutions hereby submits the attached report providing the information required by 10 CFR 71.95(a)(3) for instances in which the conditions of approval in the Certificate of Compliance for the 8-120B Cask (Certificate of Compliance #9168) may not have been observed in making certain shipments. The circumstances described in this report are applicable to approximately 235 shipments made by *EnergySolutions* as a licensee and user of the 8-120B cask over a 21 month period.

If you have any questions regarding this submittal, please contact me at 801-649-2109.

Daniel B. Shrum


Senior Vice President, Regulatory Affairs
EnergySolutions LLC

Dan Shrum
Jun 24 2015 2:58 PM

 eSign

Attachment: Failure to Observe Certificate of Compliance Conditions for the 8-120B Vent Port Leak Pre-Shipment Leak Test

cc: Michele Sampson, Chief
Spent Fuel Licensing Branch

Pierre M. Saverot
Licensing Branch

**Failure to Observe Certificate of Compliance Conditions
for the 8-120B Vent Port Pre-Shipment Leak Test**

June 24, 2015

1) Abstract

During the vent port seal pre-shipment leak rate test, a neoprene gasket that was added under the test manifold may have reduced the test sensitivity below the required value. The test manifold and gasket are not licensed packaging components. The gasket was added to the test manifold on some or all shipments to more reliably seal the manifold, saving test time and reducing personnel exposures. The amount of reduction of the test sensitivity cannot be determined for any particular shipment due to several reasons as discussed below. The gasket may have been used on as many as 100 shipments by EnergySolutions as the licensee from September 2013 through June 2015. The condition was determined not to have significant safety consequence because the seals receive periodic helium leak testing as required by the SAR, the vent ports are only opened rarely, there is a margin of conservatism of approximately a factor of 9 on the prescribed vent port leak rate test, and there have been no observations of contamination around the vent port openings that would suggest leakage. There will be no further tests made using the gaskets since EnergySolutions has replaced all of the subject gaskets with a modified version that does not have the potential to reduce the test sensitivity.

It is uncertain whether, or by how much, the sensitivity of the vent port pre-shipment leak tests was reduced because: 1) Use of the gasket was optional- the gasket may, or may not have been in place for the tests, and 2) The force with which the gasket was compressed during testing is unknown, so it is uncertain if caused the gasket to constrict onto the head of the vent port cap screw.

2) Narrative Description of the Event

a) Status of Components

All of the 8-120B packaging components are operating normally. The neoprene gaskets that caused the event have all be removed from service and replaced with a new manifold gasket, as discussed in (4) below.

b) Dates of Occurrences

From September 2013, when pre-shipment leak tests were first performed using the neoprene gasket, to present, approximately 100 shipments were made by EnergySolutions as the licensee. Most of these shipments used the neoprene gasket to perform the pre-shipment leak rate test of the vent port.

c) Cause of Error

New 8-120B lids went into service in September 2013. It was found that the manifold sometimes had problems sealing with the vent port on these new lids. EnergySolutions personnel found that adding an extra neoprene gasket helped to reduce the false test failures. Since the pre-shipment leak rate test is performed in a radiation environment, false failures are undesirable because they increase the personnel exposure. The personnel did not realize that the gaskets had the potential to reduce the test sensitivity.

Attachment 1 has a detailed description of the test configuration.

d) Failure Mode, Mechanism, and Effects

The neoprene gasket can constrict on the head of the vent port plug cap screw when it is compressed by the bottom end of the test manifold stinger, which could reduce the sensitivity of the pre-shipment leak test. Consequently, the vent port pre-shipment leak tests performed using the neoprene gasket may not have provided the required test sensitivity of 1×10^{-3} ref-cm³/sec.

e) Systems or Secondary Functions Affected

Not applicable.

f) Method of Discovery of the Error

On Monday June 1, 2015, an 8-120B cask user identified a concern that the neoprene gasket could potentially affect the integrity of the vent port seal pre-shipment leak test. Later that week EnergySolutions performed a bench test that confirmed that the neoprene gasket can constrict on the head of the vent port plug cap screw when it is compressed by the manifold, resulting in a reduction of the test sensitivity.

3) Assessment of Safety Consequences

Pre-shipment leak tests of all containment seals, including the vent port, were performed prior to every shipment in accordance with the requirements of Chapter 7 of the SAR. In addition, periodic and maintenance leak tests of the containment seals, using helium as the test gas, were performed after maintenance, repair, or replacement of the containment seals in accordance with the requirements of Chapter 8 of the SAR.

The 8-120B preshipment leak rate test criteria were sized for the large primary lid. Since the vent port has a much smaller test volume, the test specification is conservative. Calculations show that the test specified in the SAR is a factor of 9 more sensitive than the 1×10^{-3} ref-cm³/sec required by Chapter 8 of the SAR. However, due to the uncertainties in the effects of the gasket, and the behavior of seals in series, it is not possible to confirm whether the reduction in sensitivity is offset by the test criteria conservatism.



ENERGYSOLUTIONS

There has been no indication of any leakage from the vent port from any shipment, and therefore, no exposure of individuals to radiation or radioactive materials due to the gaskets. It is also noted that it is unusual for the vent port seal to be opened during cask operations, in which case the previous helium leak test of the vent port seal provides added assurance of seal integrity.

Therefore, it is concluded that there has been no safety consequence from performing vent port pre-shipment leak tests that may not have provided the required test sensitivity of 1×10^{-3} ref-cm³/sec.

4) **Planned Corrective Actions**

EnergySolutions has taken corrective actions to assure that use of the old neoprene gasket design for the vent port pre-shipment leak test is immediately discontinued.

- *EnergySolutions* notified all 8-120B cask users with upcoming shipments to require use of a new procedure, in conjunction with the new manifold gasket design, for pre-shipment leak testing of the vent port seal on all future shipments.
- *EnergySolutions* designed and tested new manifold gasket design that does not constrict onto the head of the vent port plus screw when compressed, and therefore it does not reduce the test sensitivity. The new gaskets have been distributed to all upcoming shipment users. The new manifold gasket design is shown in Attachment 1. The *EnergySolutions* drawing for the 8-120B air drop manifold have been revised to include the new gasket seal, and the air pressure drop test procedure TR-TP-002 has been revised to incorporate the new pre-shipment leak test procedure for the vent port. Use of the new procedure and the new manifold gasket will assure that the pre-shipment leak test satisfies the required test sensitivity and that the manifold gasket is removed from the test port after completing the pre-shipment leak test.

5) **Previous Similar Events Involving the 8-120B**
No previous similar events have been identified.

6) **Contact for Additional Information**
Dan Shrum

EnergySolutions

Senior Vice President, Regulatory Affairs

(801) 649-2109

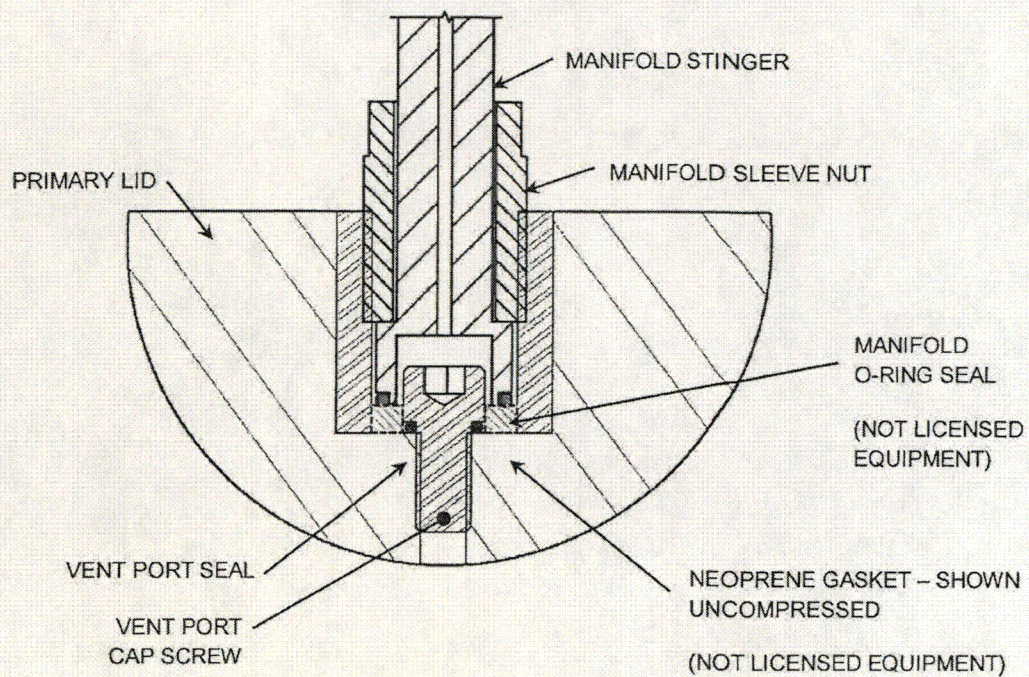
7) **Extent of Exposure of Individuals to Radiation or Radioactive Materials**
None.

Attachment 1

Details of the 8-120B Vent Port Leak Rate Test Setup

The 8-120B CoC requires the package to be prepared for shipment and operated in accordance with Chapter 7 of the SAR, and tested and maintained in accordance with Chapter 8 of the SAR. Step 7.1.14 of the SAR requires a pre-shipment leak test of the primary lid, secondary lid, and vent port seals to be performed in accordance with Section 8.3.2.2 prior to every shipment to assure that the containment system is properly assembled. Per Table 8-2 of the SAR, the pre-shipment leak test of the vent port is performed by connecting a test manifold to the vent port, pressurizing the seal and head of the vent port cap screw to 18 psig with dry air or nitrogen, and monitoring the pressure for at least 15 minutes to assure that it does not drop by more than 0.1 psig.

The pre-shipment leak test of the vent port is a pressure drop test performed using a dedicated test manifold. The test manifold is not a part of the licensed package. It includes a stinger (shown below), an O-ring seal that contacts the stinger and the bottom of the vent port hole, and a sleeve nut to compress the O-ring seal. The test manifold was designed so that it surrounds the vent port cap screw, leaving a small gap between itself and the vent port cap screw. The 8-120B cask fleet began to ship with a new lid design in September 2013, and operations staff noted more frequent difficulty getting the manifold to seal. It became desirable to find a better way to seal the bottom of the manifold in order to minimize operator exposure. They found that adding a neoprene gasket (also not part of the licensed package) under the base of the stinger as shown below helped reduce testing time and exposure.



Corrective Action – Modified Test Seal

The new manifold gasket design, shown below, replaces the manifold O-ring seal and neoprene gasket previously used with a neoprene gasket that fits within the notch at the base of the manifold stinger.

