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August 24, 2015

PG&E Letter DCL-15-102

10 CFR 71.95

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

Docket No. 50-275, OL-DPR-80  
Docket No. 50-323, OL-DPR-82  
Diablo Canyon, Units 1 and 2  
Diablo Canyon Power Plant 10 CFR 71.95 Report Regarding EnergySolutions'  
Model 8-120B Shipping Cask

Dear Mr. Lombard:

Pacific Gas and Electric Company (PG&E) hereby submits the enclosed report pursuant to 10 CFR 71.95(a)(3) regarding instances in which the conditions of approval in Certificate of Compliance Number 9168, for the EnergySolutions' Model 8-120B shipping cask, were not met when making radwaste shipments from the Diablo Canyon Power Plant.

Enclosure 1 contains the 10 CFR 71.95 Report, prepared by PG&E, regarding the EnergySolutions' Model 8-120B Shipping Cask.

Enclosure 2 contains a copy of the Customer Notification letter and associated 10 CFR 71.95 Report, provided by EnergySolutions, regarding the EnergySolutions' Model 8-120B Shipping Cask.

PG&E makes no new or revised regulatory commitments (as defined by NEI 99-04) in this report. PG&E will implement corrective actions in accordance with the site Corrective Action Program.

If you have any questions concerning this submittal, please contact Mr. Hossein Hamzehee at 805-545-4720, or Mr. Timothy Irving at 805-545-3015.

Sincerely,

Barry S. Allen



Document Control Desk  
August 24, 2015  
Page 2

PG&E Letter DCL-15-102

dqmg/6192/50708969

Enclosures

cc/enc: Marc L. Dapas, Regional Administrator  
Mark Lewis, EnergySolutions LLC  
Siva Lingam, NRC Project Manager  
John P. Reynoso, Acting Senior Resident Inspector  
INPO  
Diablo Distribution

**Diablo Canyon Power Plant  
10 CFR 71.95 Report Regarding  
EnergySolutions' Model 8-120B Shipping Cask**

**1. Abstract:**

This report provides information required by 10 CFR 71.95, "Reports," for instances in which the conditions of approval in Certificate of Compliance (CoC) Number 9168, issued to EnergySolutions, LLC (EnergySolutions), for its Model 8-120B shipping cask, were not observed in making radioactive waste shipments. The circumstances described in this report apply specifically to Pacific Gas and Electric Company's (PG&E's) Diablo Canyon Power Plant (DCPP). On June 24, 2015, DCPP identified 4 shipments that failed to comply with the recently interpreted, vent port leak test requirements associated with the subject CoC.

Between 2013 and 2015, DCPP made 4 Type-B shipments with this cask and removed the cask vent port plug each time. After replacing the vent port plug, DCPP leak tested the vent port in accordance with PG&E's Maintenance Procedure (MP) M-50.23, "Loading Pre-Loaded Liners Into The Chem-Nuclear CNS 8-120B Radioactive Waste Shipping Cask," and the vendor's cask procedure.

There were no components or system failures that contributed to this event.

**2. Narrative Description of Event**

The Model 8-120B shipping cask is a cylindrical, carbon steel, lead-shielded package designed for the transport of radioactive waste containers. The cask has both a full-opening primary lid and a smaller, inner-secondary lid. Test ports for leak testing these package lids are located between the twin O-ring seals for both the primary and secondary lids. Each package has a vent and optional drain port which can be used to inert the cask cavity with nitrogen, or vent pressure within the containment cavity which may be generated during transport, prior to lid removal. The vent hole in the primary lid is sealed with a removable plug and silicone gasket. There are no complex operational requirements associated with the package. An air test rig with a pressure gauge is engaged above each of the test ports or vent hole to pressurize the cavity. During leak testing, the air supply is isolated and the gauge is monitored to ensure a pressure drop of no more than 0.05 pounds-per-square-inch over the 15 minute test period.

DCPP procedure MP M-50.23, "Loading Pre-Loaded Liners into EnergySolutions' 8-120B Radwaste Shipping Cask," specified a 15-minute hold time for the pre-shipment leak test of the cask vent port, which was successfully completed for all 4 shipments. However, DCPP now recognizes the test manifold gasket may have reduced test sensitivity below the value required for the vent port plug. Therefore, the conditions of approval in the CoC were not met when making these shipments. This failure was identified on June 24, 2015, by a letter from EnergySolutions.

**i. Status of inoperable components or systems**

Not applicable. None of the components or systems were inoperable.

**ii. Dates and approximate times of occurrences**

The testing for these 4 shipments occurred between July 2014 and April 2015.

**iii. Cause of Error**

Test manifold gasket blocked the full air pressure on the vent port plug.

**iv. Failure Mode, Mechanism, and Effects**

Not applicable.

**v. Systems or Secondary Functions Affected**

Not applicable.

**vi. Method of Discovery of the Error**

During an industry audit of *EnergySolutions*, a concern was raised that the test manifold gasket could reduce the preshipment leak test sensitivity below the require value for the vent port plug.

**vii. Discussion of Cause**

The test manifold gasket, when compressed, may deform and cover the vent port plug reducing the sensitivity of the leak test.

**viii. Manufacturer and Model Number**

Manufacturer: *EnergySolutions, LLC*

Model Number: 8-120B

**ix. Quantities and chemical and physical form(s) of the package contents**

These shipments were all Physical/Chemical form Solid/Oxides on resin and their quantities are as shown in the table below.

	Date	Quantity (Curies)
RWS-14-001	07/16/14	49.7



	Date	Quantity (Curies)
RWS-14-002	07/25/14	48.2
RWS-15-002	03/25/15	82.5
RWS-15-003	04/01/15	28.5

### **3. Assessment of Safety Consequences**

Based on the safety evaluation conducted by *EnergySolutions*, there is no safety consequence of performing the preshipment leak test of the Model 8-120B cask vent port plug.

### **4. Corrective Actions**

PG&E is reviewing the need to use this cask in the future. If used in the future, DCPD will revise DCPD procedure MP M-50.23, "Loading Pre-Loaded Liners into *EnergySolutions*' 8-120B Radwaste Shipping Cask," prior to using it. *EnergySolutions* revised Procedure TR-TP-002 to replace the test manifold gasket with a different type.

### **5. Previous Similar Events**

In 2013, PG&E submitted a report on an inadequate leak test time for the vent port plug on this model cask (PG&E Letter DCL-13-094, "Diablo Canyon Power Plant and Humboldt Bay Power Plant 10 CFR 71.95 Reports Regarding *EnergySolutions*' Model 8-120B Shipping Cask," dated September 30, 2013).

### **6. Contact for Additional Information**

Clint Miller, DCPD Radwaste Engineer, 805-545-4582.

### **7. Extent of Exposure of Individuals to Radiation or Radioactive Materials**

The vent port was adequately sealed, and there was no additional exposure of individuals to radiation or radioactive material as the result of the deficient leak test.

**Copy of EnergySolutions Customer Notification Letter and  
10 CFR 71.95 Report on the 8-120B Cask**

# 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](mailto: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

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# ENERGYSOLUTIONS

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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

CSign

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. Savérot  
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  $1 \times 10^{-3}$  ref-cm<sup>3</sup>/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  $1 \times 10^{-3}$  ref-cm<sup>3</sup>/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.

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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  $1 \times 10^{-3}$  ref-cm<sup>3</sup>/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

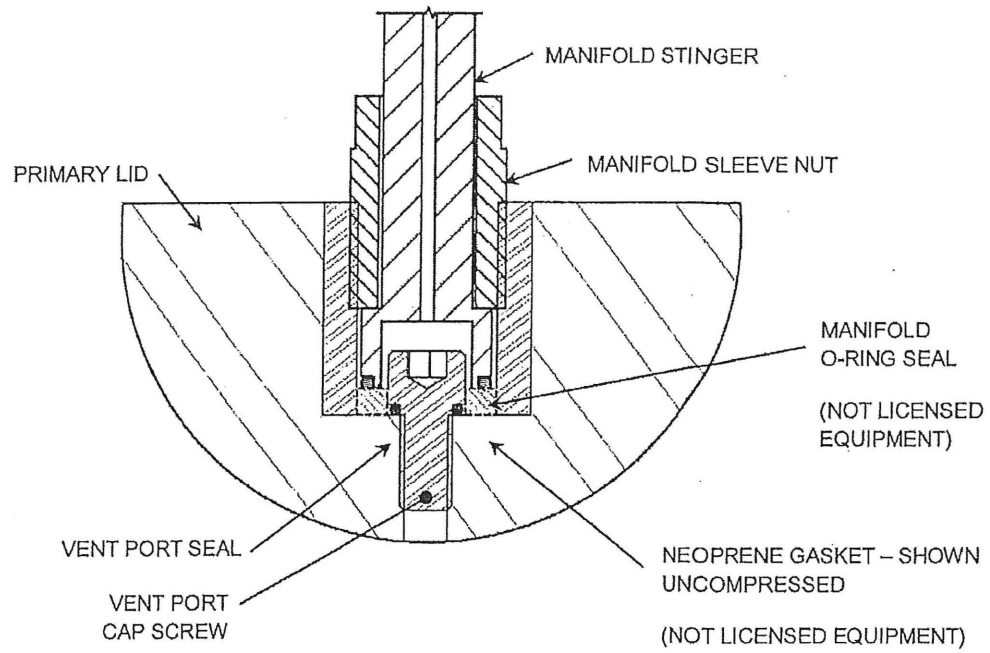
Details of the 8-120B Vent Port Leak Rate Test Setup

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.



# ENERGY SOLUTIONS



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### 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.

