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NRC-15-0085

10 CFR 71.95

Director, Division of Spent Fuel Management
Office of Nuclear Material Safety and Safeguards

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Reference: Fermi 2
NRC Docket No. 50-341
NRC License No. NPF-43

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

DTE Electric Company (DTE) hereby submits the enclosed report providing the information required by Title 10 *Code of Federal Regulations* 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 a shipment. The circumstances described in this report are specific to DTE at the Fermi 2 Nuclear Plant and are applicable to 10 shipments made by DTE as a user of the 8-120B cask over a 16 month period.

This letter contains no new regulatory commitments.

Should you have any questions or require additional information, please contact Mr. Christopher Robinson, Licensing Manager at (734) 586-5076.

Sincerely,

Vito A. Kaminskas
Site Vice President

USNRC
NRC-15-0085
Page 2

Enclosure: 10 CFR 71.95 Report - Failure to Observe Certificate of Compliance
Conditions for the 8-120B Vent Port Pre-Shipment Leak Test

cc: NRC Project Manager
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Enclosure to NRC-15-0085

**10 CFR 71.95 Report - Failure to Observe Certificate of Compliance
Conditions for the 8-120B Vent Port Pre-Shipment Leak Test**

10 CFR 71.95 Report - Failure to Observe Certificate of Compliance Conditions for the 8-120B Vent Port Pre-Shipment Leak Test

1. Abstract

This report provides the information required by Title 10 Code of Federal Regulations (10 CFR) Part 71.95, "Reports," for instances in which the conditions of approval in Certificate of Compliance (CoC) Number 9168 for the model 8-120B shipping cask may not have been observed prior to making a shipment. The circumstances described in this report are applicable specifically to DTE Electric Company (DTE) at the Fermi 2 Nuclear Power Plant.

On June 1, 2015, while preparing an 8-120B cask for shipment, DTE personnel identified multiple neoprene gaskets within the vent port cavity and additional neoprene gaskets in both the primary lid and secondary lid test port cavities upon initial inspection. The neoprene gaskets found were not specified by the cask drawings or Safety Analysis Report (SAR). The neoprene gaskets showed indication of being used for previous air tests as evidenced by indentations on gasket surface matching that of the *EnergySolutions* supplied test manifold. Based on this discovery, DTE personnel questioned *EnergySolutions* whether the additional neoprene gaskets could potentially affect the integrity of the vent port seal pre-shipment leak test. DTE personnel removed all the neoprene gaskets from the vent port cavity and performed the required leak test. The test was satisfactory; however, due to other issues, the cask was returned to *EnergySolutions* un-used.

EnergySolutions performed testing that confirmed that the neoprene gaskets supplied with the cask for the leak test can constrict on the head of the vent port plug cap screw when it is compressed by the manifold, resulting in a reduction in test sensitivity. This issue was communicated to DTE on June 25, 2015, and entered into the Fermi 2 corrective action program on June 26, 2015. Based on the *EnergySolutions* notice, this condition potentially existed since the new 8-120B cask lids were placed into service in September 2013 when *EnergySolutions* started to provide the extra neoprene gaskets.

The investigation identified that DTE completed eleven shipments with the 8-120B cask during this period. A review of the shipment checklists for each of these shipments identified one shipment in January of 2015 which specifically identified gaskets within the vent test port and noted that they were removed prior to testing. The remaining 10 checklists did not contain any notes detailing the installation, configuration of the test equipment, any anomalies, or whether or not gaskets were used as part of the tests, as this level of detail is not required. This report is submitted since the potential existed that these neoprene gaskets may have been used in the completion of some of the leak tests performed between September 2013 and December 2014.

There were no components or system failures that contributed to this event. As a corrective action, the neoprene gaskets have been removed from the test manifold kit included with the cask and the *EnergySolutions* leak test procedure has been revised to specify the type of

gasket that can be used with the vent port. Industry notifications were made by EnergySolutions.

2. Narrative Description of Event

The model 8-120B cask is a cylindrical, carbon steel, lead shielded packaging 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 the package lids are located between the twin O-ring seals for both the primary and secondary lids. Each package is provided with a vent port which can be used for venting pressure within the containment cavity that may be generated during transport, prior to lid removal. The vent plug consists of a socket head cap screw (1/2-13UNC-2A x 1" length, full thread / ASTM-307A), with a 1/2" nominal I.D. seal (See Attachment 1). This plug is in the bottom of a threaded cavity that is pressurized for testing to ensure the cask is leak-tight prior to shipment. The gaskets that were discovered in the vent port covered the entire bottom of the cavity and extended to the top of the cap screw. There are no complex operational requirements associated with the package. An air test rig with a pressure gauge is screwed into each of the test ports to pressurize the cavity.

i. Status of inoperable components or systems

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

ii. Dates and approximate times of occurrences

From September 2013, when the extra gaskets were first supplied by EnergySolutions, eleven shipments were made by DTE. Based on review of documentation, no conclusive evidence on test manifold installation, configuration or whether gaskets were used (or not) for the test could be established for 10 of the shipments. This report is submitted since the potential existed that these gaskets may have been used in the completion of the leak test. For one shipment completed in January 2015, a note on the checklist detailed that extra gaskets were found in the vent port cavity and removed prior to testing, and as such, is not reportable.

iii. Cause of Error

Inappropriate gaskets were provided by EnergySolutions that were intended to limit test failures. The use of these gaskets was not completely evaluated by EnergySolutions for unintended consequences.

iv. Failure Mode, Mechanism, and Effects

The neoprene gaskets provided by EnergySolutions 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, if performed using the neoprene gasket, may not have provided the required test sensitivity of 1×10^{-3} ref-cm³/sec.

v. Systems or Secondary Functions Affected

Not applicable.

vi. Method of Discovery of the Error

DTE personnel questioned the cask licensee on the use of the gaskets after discovery of multiple gaskets within the vent test port and noting the tight fitting nature of the gaskets to the test plug. This concern was validated after testing by the cask licensee.

vii. Discussion of Cause

New 8-120B cask lids went into service in September 2013. It was identified by *EnergySolutions* that the manifold sometimes had problems sealing with the vent port on these new lids. *EnergySolutions* personnel provided gaskets and implemented a procedure for use to help reduce false test failures without realizing the gaskets had the potential to reduce the test sensitivity.

viii. Manufacturer and Model Number

Manufacturer: *EnergySolutions*
Model Number: 8-120B

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

These 10 shipments each consisted of 120.3 cubic feet of dewatered powdered resin or filters within inner containers, ranging in activity from 163 Curies to 945 Curies per shipment. The chemical form is metal oxides in solid form.

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.

As reported by *EnergySolutions*, the 8-120B pre-shipment 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. *EnergySolutions* calculations show that the test specified in the SAR is a factor of 9 times more sensitive than the 1×10^{-3} ref-cm³/sec required by Chapter 8 of the SAR. However, due to uncertainties in the effects of the gasket, and the behavior of the seals in series, it is not possible to confirm whether the reduction in sensitivity is offset by the test criteria conservatism.

4. Corrective Actions

As reported in their 71.95 report (see Section 5), *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, including:

- The large neoprene gaskets are no longer supplied with the casks.
- *EnergySolutions* designed and tested a new manifold gasket that does not constrict onto the head of the vent port cap screw when compressed, and therefore, does not

reduce the test sensitivity. The new gaskets have been distributed to all upcoming shipment users. The new manifold gasket design and configuration is shown in Attachment 1.

- *EnergySolutions* notified all 8-120B cask users with upcoming shipments of the requirement to use 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.

The *EnergySolutions* drawing for the 8-120B air drop manifold has been revised to include the new gasket seal, and the *EnergySolutions* air pressure drop test procedure, TR-TP-002, has been revised to incorporate the new pre-shipment leak test procedure for the vent port.

No other specific actions are required by DTE.

5. Previous Similar Events

EnergySolutions has submitted a 10 CFR 71.95 report, dated June 24, 2015, with additional details on this condition / event discovery (ML15202A058).

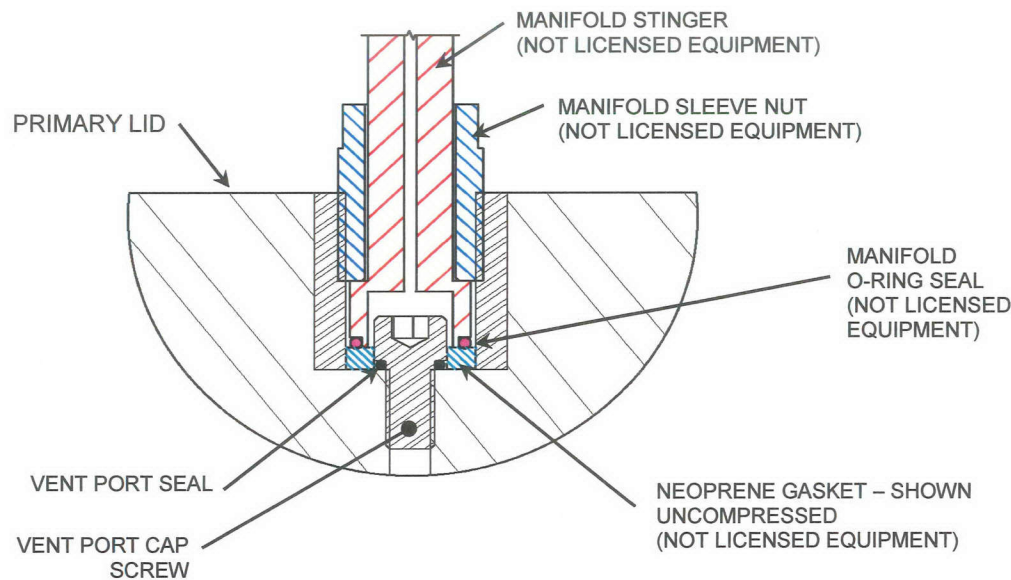
6. Contact for Additional Information

Bryan A. Weber
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7. Extent of Exposure of Individuals to Radiation or Radioactive Materials

None identified.

Test Seal Configuration with Neoprene Gasket



Modified Test Seal Configuration

