VERMONT YANKEE LICENSING DEPARTMENT
NRC INCOMING CORRESPONDENCE DISTRIBUTION

NVY _15-063

Agency Letter Date _4/8/2015

SUBJECT: Certificate Of Compliance No. 9168, Revision No. 21, For The Model No. 8-120B Package

TECHNICAL LEAD: M. Vandale

RESPONSE DUE TO NRC: N/A

LICENSING LEAD: J. Meyer

☐ YES ☒ NO 10CFR19.11(a)(4) action? If yes, posting is required within 2 working days of receipt.

COMMITMENT IDENTIFIED: YES/NO (If yes, enter EN-LI-110)

COMMENTS:

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Latest update: April 20, 2015 (DME)

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☐ Jeff Meyer, Licensing **(IR)** Notes: 2 and 3
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Distributed by: DME Date: 4/20/15

NOTES:
1) (IR) – Inspection Reports
2) For IRs, Licensing verifies that CRs generated adequately recognize and address any violations/findings identified in the IR. If necessary, the responsible manager is contacted to resolve discrepancies (e.g. update CR, initiate a CRCA to address, initiate new CR). Also ensure a CA is created to perform a closure review per EN-LI-102.
3) For annual and semi-annual assessment letters, coordinate a SARB meeting to determine the pre-inspection assessments that will be performed and ensure CA&A issues the associated LOs (EN-LI-104).

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

NVY 15-063

April 8, 2015

received
4/20/2015

Mr. Steven E. Sisley
Cask Licensing Manager
Energy*Solutions* Products and Technology Group
2105 South Bascom Ave., Suite 230
Campbell, CA 95008

SUBJECT: CERTIFICATE OF COMPLIANCE NO. 9168, REVISION NO. 21, FOR THE MODEL NO. 8-120B PACKAGE

Dear Mr. Sisley:

As requested by your application dated February 19, 2015, enclosed is Certificate of Compliance No. 9168, Revision No. 21, for the Model No. 8-120B package. The staff's safety evaluation report is also enclosed.

The approval constitutes authority to use the package for shipment of radioactive material and for the package to be shipped in accordance with the provisions of Title 49 of the *Code of Federal Regulations* (49 CFR) 173.471. Those on the attached list have been registered as users of the package under the general license provisions of 10 CFR 71.17 or 49 CFR 173.471.

If you have any questions regarding this certificate, please contact Pierre Saverot of my staff at (301) 415-7505.

Sincerely,

Michele Sampson, Chief
Spent Fuel Licensing Branch
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9168
TAC No. L24995

Upon removal of Enclosure 3, this document is uncontrolled

Enclosures:
1. Certificate of Compliance No. 9168, Rev. No. 21
2. Safety Evaluation Report
3. Registered Users

cc w/encls. 1&2: R. Boyle, Department of Transportation
J. Shuler, Department of Energy

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NRC FORM 618
(8-2000)
10 CFR 71

U.S. NUCLEAR REGULATORY COMMISSION

CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGE
9168	21	71-9168	USA/9168/B(U)-96	1 OF	4

2. PREAMBLE

a. This certificate is issued to certify that the package (packaging and contents) described in Item 5 below meets the applicable safety standards set forth in Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material."

b. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. THIS CERTIFICATE IS ISSUED ON THE BASIS OF A SAFETY ANALYSIS REPORT OF THE PACKAGE DESIGN OR APPLICATION

a. ISSUED TO *(Name and Address)*

EnergySolutions
Suite 100, Center Point II
100 Center Point Circle
Columbia, SC 29210

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION

EnergySolutions application, Revision No. 9, dated February 2015.

4. CONDITIONS

This certificate is conditional upon fulfilling the requirements of 10 CFR Part 71, as applicable, and the conditions specified below.

5.

(a) Packaging

(1) Model No.: 8-120B

(2) Description

A cylindrical carbon steel, lead shielded, packaging designed for the transport of radioactive waste materials. The packaging has four tie-down and two removable lifting devices and is transported in the upright position with cylindrical foam-filled impact limiters, 102 inches outside diameter (OD), installed at each end of the packaging. The overall height of the package with the impact limiters attached is 132 ¼ inches. The maximum gross weight of the package is approximately 74,000 pounds (lbs), as follows:

Packaging Body	42,220 lbs
Lid	7,080 lbs
Payload	14,150 lbs
Impact Limiters	4,860 lbs (each)
Miscellaneous	830 lbs
Package	74,000 lbs

The cavity of the packaging is a right circular cylinder with an internal diameter of 61 13/16 inches and a height of 74 7/8 inches. The package body consists of two shells, both fabricated of ASTM A516, Grade 70 steel. The annular space between the 1½ inch thick external shell and the ¾ inch thick internal shell is filled with 3.35 inch thick lead. The primary lid is attached to the packaging body with twenty equally spaced 2-inch diameter bolts. A supplemental 14 gauge stainless steel sheet is welded to the inside surface of the primary lid.

5(a)(2) Packaging Description (Continued)

The centered secondary lid is attached to the primary lid with twelve equally spaced 2-inch diameter bolts. A thermal shield, consisting of two polished stainless-steel plates separated by a thin air gap, is attached to the secondary lid lifting lugs with hitch-pins. A ½ inch thick steel plate covers the central hollow region of the lower impact limiter. A 12 gauge stainless steel liner is welded to the cavity of the package and the lid surface to protect all accessible areas from contamination.

The containment boundary consists of the inner shell, the upper baseplate, the bolting ring, the inner O-rings of the lids, and the lids. Test ports for leak testing of the package are located between the twin O-ring seals for both the primary and secondary lids.

There are three configurations of the packaging: Configuration 1 includes a drain port, sealed with the insertion and welding of a rod in the drain port; Configuration 2 does not have a drain port; Configuration 3 does not have a drain port and the packaging's base plate is fabricated differently than for Configurations 1 and 2. Fabrication of Configurations 1 and 2 is not authorized.

(3) Drawings

The packaging is constructed and assembled in accordance with Energy*Solutions* Drawing Nos. C-110-E-0007, sheets 1-6, Revision No. 21.

The secondary lid thermal shield is constructed in accordance with Energy*Solutions* Drawing No. DWG-CSK-12CV01-EG-0001-01, Rev. 3.

(b) Contents

(1) Type and form of material

(i) Byproduct, source, or special nuclear material in the form of dewatered resins, solids, including powdered or dispersible solids, or solidified material, contained within secondary containers; or

(ii) Radioactive material in the form of activated metals, or metal oxides in solid form, contained within secondary containers.

(2) Maximum quantity of material per package

(i) Activity not to exceed 3,000 times a Type A quantity along with the following limits:

(1) The limit determined per the procedure in Attachment 1 to Chapter No. 7 of the application for beta and gamma emitting radionuclides.

(2) The mass limits for fissile materials as prescribed by 10 CFR 71.15 for exempting materials from classification as fissile material.

(3) A maximum total package neutron source of $1x10^5$ neutrons/second for materials that produce neutrons (other than fissile materials) through any means, including spontaneous fission, alpha-neutron reactions, and gamma-neutron reactions.

(ii) Maximum decay heat: 200 Watts.

(iii) Maximum weight of contents: 14,150 lbs including shoring and secondary containers.

(iv) Powdered or dispersible solid materials must have a mass of at least 60 grams or a specific activity of 50 A_2/g or less.

(v) Explosives, corrosives, and non-radioactive pyrophorics are prohibited. Pyrophoric radionuclides may be present only in residual amounts below 1 weight per cent.

(vi) Materials that may auto-ignite or change phase at temperatures below 350°F, not including water, shall not be included in the contents. Also, contents shall not include any materials that may cause any significant chemical, galvanic, or any other reaction.

(vii) Powdered radioactive materials shall not include radioactive forms of combustible metal hydrides or combustible element metals, i.e., magnesium, titanium, sodium, potassium, lithium, zirconium, hafnium, calcium, zinc, plutonium, uranium, and thorium, or combustible non-metals, e.g., phosphorus.

(viii) Contents may only include quantities of boron, lithium, or beryllium such that these materials do not constitute quantities sufficient to be considered as a bulk material for a payload item or a portion of that payload item.

6. In addition to the requirements of Subpart G of 10 CFR Part 71:

(i) The package must be prepared for shipment and operated in accordance with the Operating Procedures of Chapter 7 of the application,

(ii) The packaging must be tested and maintained in accordance with the acceptance tests and maintenance program described in Chapter 8 of the application.

7. Except for close fitting contents, shoring must be placed between the secondary containers, or activated components, and the package cavity's walls to prevent both radial and axial movements during transport.

8. Flammable gas (hydrogen) concentration is limited to less than 5% in volume. Compliance with this concentration limit is determined by the methodology used in NUREG/CR-6673.

NRC FORM 618 (8-2000) 10 CFR 71			U.S. NUCLEAR REGULATORY COMMISSION		
CERTIFICATE OF COMPLIANCE FOR RADIOACTIVE MATERIAL PACKAGES					
1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGE
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9. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.

10. Revision No. 20 of this certificate may be used until March 31, 2016.

11. Expiration date: August 31, 2017.

REFERENCES

EnergySolutions application, Revision No. 9, February 2015.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Michele M. Sampson, Chief
Spent Fuel Licensing Branch
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards

Date: April 8, 2015

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION REPORT
Docket No. 71-9168
Model No. 8-120B
Certificate of Compliance No. 9168
Revision No. 21

SUMMARY

By letter dated February 19, 2015, Energy*Solutions* (ES) submitted an amendment request to the U.S. Nuclear Regulatory Commission (NRC) for the Model No. 8-120B package. ES requested the cask cavity length manufacturing tolerance be modified from ± ¼" to + ¼" and – ¾" in order to envelop the "as-built" cavity length of a recently manufactured package.

NRC staff reviewed the applicant's amendment request and found that the package meets the requirements of 10 CFR Part 71.

1.0 GENERAL INFORMATION

Except for the ½" increase in the minus tolerance for the cavity of the package, the design of the package, its overall dimensions, as well as the authorized contents, remain unchanged.

The staff reviewed Drawing No. C-110-E-0007, sheets 1-6, Revision 21. The revised drawing includes the cavity length tolerances of +1/4" and – ¾" on sheet 1, Elevation View – Cask, Zone C-7. An editorial correction was also made in the title block of sheet 2 of Drawing No. C-110-E-007 to indicate it was a "B-size" drawing.

Energy*Solutions*' Drawing No. DWG-CSK-12CV01-EG-0001-0 was not modified.

2.0 STRUCTURAL EVALUATION

The structural evaluation of the package remains unchanged. The change in the cavity fabrication tolerances does not change either the specified thickness or strength of the structural components of the package. Also, the ½" increase in the minus tolerance reduces the cavity size by less than 0.7%. As such, this small reduction does not affect the mass properties or any other properties that are of importance in the structural evaluation of the package.

The staff has reasonable assurance that the structural design of the Model No. 8-120B package has been adequately described and evaluated and that the package meets the structural requirements of 10 CFR Part 71.

3.0 THERMAL EVALUATION

The ½" increase in the minus tolerance of the cavity length does not significantly affect the thermal evaluation of the package.

Staff built a 2-D model of the package to perform sensitivity analyses on the impact a reduced cavity length, volume, and surface area could have on the package temperatures for normal conditions of transport (NCT). Staff found that the package temperatures under NCT are not significantly increased, i.e., by less than 2°F. Given the significant margins on the operating pressures during hypothetical accident conditions (HAC), i.e., 155 psig vs. 66.6 psig maximum calculated pressure, the staff does not expect this small temperature increase to have any impact on the thermal evaluation of the package. Also, the reduction in the cavity length results in a slightly lower peak temperature for the HAC thermal test.

The staff has reasonable assurance that the thermal design of the Model No. 8-120B package has been adequately described and evaluated, and that the package meets the thermal requirements of 10 CFR Part 71.

4.0 CONTAINMENT EVALUATION

The containment evaluation remains unchanged because the containment calculations are not based on the cavity volume.

The staff has reasonable assurance that the containment design of the Model No. 8-120B package has been adequately described and evaluated, and that the package meets the containment requirements of 10 CFR Part 71.

5.0 SHIELDING EVALUATION

The shielding evaluation is not affected because the ½" minus tolerance increase, i.e., from ¼" to ¾", of the length of the cavity, results in a very small change in dose in a conservative manner.

The staff has reasonable assurance that the shielding design has been adequately described and evaluated and that the package meets the external radiation requirements of 10 CFR Part 71.

6.0 CRITICALITY EVALUATION

Not applicable.

7.0 PACKAGE OPERATIONS

The package operations have not been changed by this amendment request. These include the use of shoring, the performance of dose rate surveys to ensure the package meets the regulatory dose rate limits, and that appropriate limits are used for preparation of empty packages.

The staff has reasonable assurance that the operating procedures both meet the requirements of 10 CFR Part 71 and are adequate to assure the package will be operated in a manner consistent with its evaluation for approval

8.0 ACCEPTANCE TESTS AND MAINTENANCE PROGRAM

The acceptance tests and maintenance program of the package remain unchanged. In the previous revision, the leak test requirement for leak-tight status, in Section 4.9 of the application, had been also included in Chapter 8 of the application.

CONDITIONS

The conditions specified in the Certificate of Compliance have been revised to incorporate several changes as indicated below:

Item No. 3.b has been revised to identify Energy*Solutions*' consolidated application dated February 2015.

Condition No. 5(a)(3) has been revised to include revision 21 of Energy*Solutions* Drawing No. C-110-E-0007, sheets 1-6.

Condition No. 10 was modified to authorize the use of the previous revision of the certificate for approximately one more year.

The expiration date of the certificate was not changed.

The references section was updated to include the consolidated application dated February 2015.

CONCLUSION

Based on the statements and representations in the application, as supplemented, and the conditions listed above, the staff concludes that the Model No. 8-120B package design has been adequately described and evaluated and that these changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9168, Revision No. 21,
on April 8, 2015.