U.S. Department
of Transportation

**Pipeline and
Hazardous Materials
Safety Administration**

East Building, PHH-23
1200 New Jersey Avenue Southeast
Washington, D.C. 20590

**COMPETENT AUTHORITY CERTIFICATION
FOR A TYPE B(U)
RADIOACTIVE MATERIALS PACKAGE DESIGN
CERTIFICATE USA/9168/B(U)-96, REVISION 0**

This certifies that the radioactive material package design described has been certified by the Competent Authority of the United States as meeting the regulatory requirements for a Type B(U) packaging for radioactive material as prescribed in the regulations of the International Atomic Energy Agency[1] and the United States of America[2].

1. Package Identification - Model 8-120B.

2. Package Description and Authorized Radioactive Contents - as described in U.S. Nuclear Regulatory Commission Certificate of Compliance No. 9168, Revision 19 (attached).

3. General Conditions -

   a. Each user of this certificate must have in his possession a copy of this certificate and all documents necessary to properly prepare the package for transportation. The user shall prepare the package for shipment in accordance with the documentation and applicable regulations.

   b. Each user of this certificate, other than the original petitioner, shall register his identity in writing to the Office of Hazardous Materials Technology, (PHH-23), Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Washington D.C. 20590-0001.

   c. This certificate does not relieve any consignor or carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.

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[1] "Regulations for the Safe Transport of Radioactive Material, 1996 Edition (Revised), No. TS-R-1 (ST-1, Revised)," published by the International Atomic Energy Agency(IAEA), Vienna, Austria.

[2] Title 49, Code of Federal Regulations, Parts 100-199, United States of America.

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d. Records of Quality Assurance activities required by Paragraph 310 of the IAEA regulations[1] shall be maintained and made available to the authorized officials for at least three years after the last shipment authorized by this certificate. Consignors in the United States exporting shipments under this certificate shall satisfy the applicable requirements of Subpart H of 10 CFR 71.

4. Marking and Labeling - The package shall bear the marking USA/9168/B(U)-96 in addition to other required markings and labeling.

5. Expiration Date - This certificate expires on August 31, 2017.

This certificate is issued in accordance with paragraph 808 of the IAEA Regulations and Section 173.471 of Title 49 of the Code of Federal Regulations, in response to the August 28, 2012 petition by Energy Solutions, Columbia, SC, and in consideration of other information on file in this Office.

Certified By:

Dr. Magdy El-Sibaie
Associate Administrator for Hazardous Materials Safety

Oct 25 2012
(DATE)

Revision 0 - issued to endorse U.S. Nuclear Regulatory Commission Certificate of Compliance No. 9168, Revision 19.

CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE		PAGE
9168	19	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)*

Energy*Solutions* Services, Inc.
Suite 100, Center Point II
100 Center Point Circle
Columbia, SC 29210

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION

Energy*Solutions* application, Revision No. 3, dated July 20, 2012, as supplemented.

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	14,430 lbs
Impact Limiters	4,860 lbs (each)
Thermal Shield	250 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 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.

(3) Drawings

The packaging is constructed and assembled in accordance with Energy*Solutions* Drawing Nos. C-110-E-0007, sheets 1-6, Revision No. 18.

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: 14,430 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. Two independent physical verifications of the secondary container's closure system shall be performed as part of the package loading operations to ensure proper closing so as to prevent release of material from the secondary container.

8. Shipments of powdered radioactive materials shall be performed only when the most recent periodic leak test meets the requirements of Section 4.8 of Chapter 4 of the application.

9. 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 movement during transport.

10. 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.

11. A pre-shipment leak test is required before each shipment of Type B quantities.

12. The package may be used until August 31, 2013, with the seals authorized in Revision No. 17 of the Certificate, in accordance with the Addendum of the July 20, 2012, application.

13. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.

14. Expiration date: August 31, 2017.

REFERENCES

EnergySolutions application, Revision No. 3, and Addendum dated July 20, 2012.

Supplements dated July 26 and August 10, 2012.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Michael D. Waters, Chief
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Date: August 23, 2012

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1200 New Jersey Avenue SE
Washington, D.C. 20590**

CERTIFICATE NUMBER: USA/9168/B(U)-96, Revision 0

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