



U.S. Department  
of Transportation  
**Pipeline and  
Hazardous Materials  
Safety Administration**

**COMPETENT AUTHORITY CERTIFICATION  
FOR A TYPE B(U)F FISSILE  
RADIOACTIVE MATERIALS PACKAGE DESIGN  
CERTIFICATE USA/9250/B(U)F-85, REVISION 11**

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

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)F packaging for fissile radioactive material as prescribed in the regulations of the International Atomic Energy Agency<sup>1</sup> and the United States of America<sup>2</sup>.

1. Package Identification - 5X22.
2. Package Description and Authorized Radioactive Contents - as described in U.S. Nuclear Regulatory Commission Certificate of Compliance No. 9250, Revision 13 (attached).
3. Criticality - The minimum criticality safety index is as stated in NRC Certificate. The maximum number of packages per conveyance is determined in accordance with Table X of the IAEA regulations cited in this certificate.
4. 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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<sup>1</sup> "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.

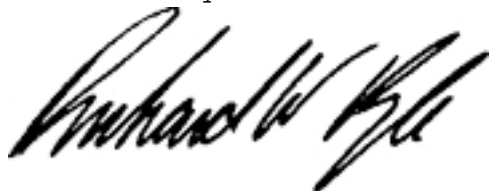
<sup>2</sup> Title 49, Code of Federal Regulations, Parts 100-199, United States of America.

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- d. Records of Quality Assurance activities required by Paragraph 310 of the IAEA regulations<sup>1</sup> 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.
5. Special Condition - Transport by air is not authorized.
6. Marking and Labeling - The package shall bear the marking USA/9250/B(U)F-85 in addition to other required markings and labeling.
7. Expiration Date - This certificate expires on October 31, 2019. On June 30, 2017, this certificate supersedes all previous revisions of USA/9250/B(U)F-85.

This certificate is issued in accordance with paragraph 817 of the IAEA Regulations and Section 173.471 and 173.472 of Title 49 of the Code of Federal Regulations, in response to the November 01, 2016 petition by BWXT NOG Technologies, Inc., Lynchburg, VA, and in consideration of other information on file in this Office.

Certified By:



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William Schoonover  
Acting Associate Administrator for Hazardous Materials Safety

**Dec 07 2016**  
(DATE)

Revision 11 - Issued to endorse U.S. Nuclear Regulatory Commission Certificate of Compliance No. 9250, Revision 13.

**CERTIFICATE OF COMPLIANCE  
FOR RADIOACTIVE MATERIAL PACKAGES**

a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
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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*)  
BWXT Nuclear Operations Group, Inc.  
P.O. Box 785  
Lynchburg, VA 24505
- b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION  
BWXT Nuclear Operations Group, Inc. application dated  
March 4, 2016.

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.: 5X22
- (2) Description

A shipping container for unirradiated uranium of any enrichment. The outer packaging is a 16-gauge steel drum, approximately 22-1/2 inches in diameter and 34-3/4 inches high, with a heavy-duty clamp ring and forged lugs. The inner vessel (containment vessel) is a Schedule 40S stainless steel pipe with a welded bottom cap and a top weldneck flange. The inner vessel lid is a blind flange which is bolted to the weldneck flange with eight hex-head bolts. The closure includes double silicone O-ring seals and a leak-test port. The dimensions of the inner vessel are approximately 5 inches ID by 22 inches high. The inner vessel is centered within the outer drum by fiberboard and supported by plywood disks. The maximum weight of the package, including contents, is 300 pounds.

(3) Drawings

The packaging is constructed in accordance with BWX Technologies, Inc., Drawing Nos. 1220276 E, Rev. 6, and 1220277 E, Rev. 10

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5.(b) Contents

Type and form of material, maximum quantity of material per package, and Criticality Safety Index.

The weight of the contents, including secondary containers, inserts, and other materials in the inner vessel, shall not exceed 50 pounds.

- (1) Unirradiated uranium as solid compounds or alloys which do not decompose at temperatures up to 250 degrees Fahrenheit, and uranium oxides as powder or pellets. The uranium may be of any enrichment. Carbide compounds are not authorized. The maximum H/U must consider all sources of moderation in the inner vessel.

Fissile Material	Maximum H/U	Maximum Fissile Mass per Package (kg)	Criticality Safety Index
U-235	3	9.0	2.0
U-235	3	1.6	0.5
U-235	20	4.0	2.0
U-233	20	0.5	1.8

- (2) Unirradiated solid uranyl nitrate in the form of uranyl nitrate dihydrate crystals, which may have small amounts of uranyl trihydrate crystals interspersed. The uranyl nitrate crystals shall have a uranium content that is from 52.5 to 56.0 percent by weight. The uranyl nitrate shall be packaged in Teflon primary containers that will not melt at temperatures up to 94 degrees Celsius. The uranium may be of any enrichment. The maximum H/U must consider all sources of moderation in the inner vessel.

Fissile Material	Maximum H/U	Maximum Fissile Mass per Package (kg)	Criticality Safety Index
U-235	3	9.0	2.0
U-235	3	1.6	0.5
U-235	20	4.0	2.0
U-233	20	0.5	1.8

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5.(b) Contents (continued)

- (3) Unirradiated uranium as solid metal. The uranium may be of any enrichment. The maximum H/U must consider all sources of moderation in the inner vessel.

Fissile Material	Maximum H/U	Maximum Fissile Mass per Package (kg)	Criticality Safety Index
U-235	3	9.0	2.5
U-235	3	1.6	0.5
U-235	20	4.0	2.0
U-233	20	0.5	1.8

- (4) Unirradiated uranium as solid metal. The uranium may be of any enrichment. The packaging must include a solid aluminum disk insert positioned in the inner vessel, as shown on BWX Technologies, Inc., Drawing No. 1220277 E, Rev. 10 (Part No. 6). The maximum H/U must consider all sources of moderation in the inner vessel.

Fissile Material	Maximum H/U	Maximum Fissile Mass per Package (kg)	Criticality Safety Index
U-235	3	9.0	2.0

- (5) Unirradiated liquid uranyl nitrate solution in sealed glass containers or screw top plastic vials, each within one or more additional plastic vials with taped lids, and within a sealed product can or polyethylene bottle containing a sufficient amount of vermiculite to absorb twice the liquid contents present. The uranium may be of any enrichment. The quantity of uranyl nitrate shall not exceed 1000 mL of solution.

Fissile Material	Maximum H/U	Maximum Fissile Mass per Package (kg)	Criticality Safety Index
U-235	N/A	0.4	0.4

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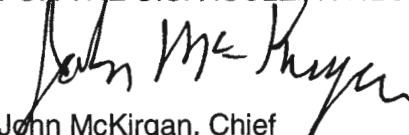
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6. The vent holes on the outer steel drum shall be capped or taped closed during transport and storage to preclude entry of rain water into the packaging.
7. In addition to the requirements of Subpart G of 10 CFR Part 71:
  - (a) Each package shall be operated and prepared for shipment in accordance with Chapter 7 of the application.
  - (b) Each package shall be acceptance tested and maintained in accordance with Chapter 8 of the application.
8. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.
9. The package is subject to the provisions of 10 CFR 71.19(c), which requires that all fabrication of this packaging must have been completed by December 31, 2006.
10. Transport by air of fissile material is not authorized.
11. Revision No. 12 of this certificate may be used until June 30, 2017.
12. Expiration date: October 31, 2019.

REFERENCES

BWXT Nuclear Operations Group, Inc., application dated March 4, 2016.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

  
John McKirgan, Chief  
Spent Fuel Licensing Branch  
Division of Spent Fuel Management  
Office of Nuclear Material Safety  
and Safeguards

Date: 6/16/16



U.S. Department  
of Transportation

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

**Pipeline and  
Hazardous Materials  
Safety Administration**

**CERTIFICATE NUMBER:** USA/9250/B(U)F-85, Revision 11

**ORIGINAL REGISTRANT(S):**

Mr. Steve Jensen  
Senior Principal Engineer  
BWXT NOG Technologies, Inc.  
BWXT NOG Technologies, Inc  
2016 Mt. Athos Road  
Lynchburg, VA 24504

**REGISTERED USER(S):**

Ms. Sandra J. Williams  
Senior Transportation Administrator  
Babcock & Wilcox Nuclear Operations Group  
P.O. Box 785  
Lynchburg, 24505  
USA