



DEPARTMENT OF ENERGY
NATIONAL NUCLEAR SECURITY ADMINISTRATION
1000 INDEPENDENCE AVENUE SW
WASHINGTON DC 20585-1000

NR:RR:KTD Downing G#16-00729
February 18, 2016

Scott Moore
Acting Director, Office of Nuclear Materials Safety and Safeguards
Nuclear Regulatory Commission
Washington, DC 20555

**NUCLEAR REGULATORY COMMISSION CERTIFICATE OF COMPLIANCE FOR THE
S3G CORE BASKET DISPOSAL CONTAINERS [USA/9786/B(U)]; REQUEST FOR
RENEWAL**

Background: The S3G Core Basket Disposal Container (CBDC) is used to make one-time shipments of irradiated core baskets and irradiated reactor components to disposal, where the container and its contents are buried. The Naval Reactors Program has made a total of six loaded shipments of S3G CBDCs. The Program currently owns one S3G CBDC, which is in storage.

Request for NRC Renewal: This letter requests renewal of the Nuclear Regulatory Commission (NRC) Certificate of Compliance (CoC) for the S3G Core Basket Disposal Container, USA/9786/B(U). The NRC CoC expires on August 31, 2016. Since the last renewal of the CoC, there have been no loaded shipments of S3G CBDCs, and there have been no operational experiences or container modifications that would preclude continued use of the container. Enclosure (1) to this letter provides a draft revision 9 of the DOE-NR CoC for your review. If you have any questions, please do not hesitate to call me at (202) 781-5921.

A handwritten signature in black ink, reading "B. K. Miles". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

B. K. Miles
Naval Reactors

Copy to and enclosure: See page 2

Enclosure: (1) DOE-NR CERTIFICATE OF COMPLIANCE FOR THE S3G CORE
BASKET DISPOSAL CONTAINER, USA/9786/B (U), REVISION 9
(DRAFT)

Copy to:

M. Lombard, Director, Spent Fuel Storage & Transportation, NMSS, NRC
S. Ruffin, Chief, Spent Fuel Licensing Branch, SFST, NMSS, NRC
B. White, Senior Project Manager, Licensing Branch, SFST, NMSS, NRC
General Manager, BMPC
Manager, Reactor Servicing, BMPC
Manager, Reactor Servicing Systems, RS, BMPC
Manager, Shipping Containers, RSS, RS, BMPC
Manager, Shipping Container Analysis, SC, RSS, RS, BMPC
T. B. Clark, Shipping Container Analysis, SC, RSS, RS, BMPC
KAPLADSARS
NRLFO

**DOE-NR CERTIFICATE OF COMPLIANCE FOR THE S3G CORE BASKET
DISPOSAL CONTAINER, USA/9786/B(U), REVISION 9 (DRAFT)**

The enclosed draft Certificate of Compliance shows additions and deletions from the current version of the certificate. Minor formatting and editorial changes are not highlighted.

Enclosure (1) to
G#16-00729

DOE F 5822.1

(5-85)
(Formerly EV-618)U. S. DEPARTMENT OF ENERGY
CERTIFICATE OF COMPLIANCE
For Radioactive Materials PackagesOMB Approval
No. 1910-2000

1a. Certificate Number USA/9786/B(U) (DOE-NR)	1b. Revision No. 9 (Proposed)	1c. Package Identification No. USA/9786/B(U) (DOE-NR)	1d. Page No. 1	1e. Total No. Pages 4
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2. PREAMBLE

- 2a. This certificate is issued under the authority of 49CFR Part 173.7(d).
- 2b. The packaging and contents described in item 5 below meets the safety standards set forth in subpart E, "Package Approval Standards," and subpart F, "Package, Special Form, and LSA-III Tests," Title 10, Code of Federal Regulations, Part 71.
- 2c. 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

(1) Prepared by (Name and address):

Bettis Atomic Power Laboratory
P. O. Box 79
West Mifflin, PA 15122-0079

Knolls Atomic Power Laboratory
P.O. Box 1072
Schenectady, NY 12301-1072

(2) Title and Identification of report or application:

Safety Analysis Report for the S3G Core
Basket Disposal Container, as
Supplemented

(3) Date

June 27, 1980

4. CONDITIONS

This certificate is conditional upon the fulfilling of the applicable Operational and Quality Assurance requirements of 49CFR Parts 100-199 and 10CFR Part 71, and the conditions specified in Item 5 below.

5. Description of Packaging and Authorized Contents, Model Number, Criticality Safety Index, Other Conditions, and References:**S3G Core Basket Disposal Container****a. Description of Packaging****(1) S5W Modified Core Barrel Removal Container**

The irradiated core basket to be shipped is loaded into an S5W Modified Core Barrel Removal Container (MCBRC) as part of the defueling operation. The S5W MCBRC is basically an upright circular cylinder 72.5 inches in diameter. The container walls consist of a 0.5 inch thick stainless steel outer shell, 5.75 inches of lead shielding and a 1.0 inch thick stainless steel inner shell. The bottom of the S5W MCBRC is a 7.62 inch thick lead-filled stainless steel door, which can slide out from under the S5W MCBRC to allow for loading of the core basket. This door is bolted into place prior to installation of the loaded S5W MCBRC into the S3G Core Basket Disposal Container (CBDC). The top of the S5W MCBRC (when loaded) consists of additional shielding and lift adapters which are attached to the irradiated core basket before loading. Additional shielding is provided around the sides of the main container by a 78.0 inch diameter carbon steel cylindrical shield, which varies in thickness from 2.0 to 2.25 inches. This cylindrical shield is welded to both the top and bottom flange of the main container. Nine cutouts around the lower end of the cylindrical shield (which provides access to bolt the sliding door in place) are filled with 2.0 inch thick plates and welded into place once the door bolts are installed. ~~A 0.25 inch thick auxiliary shield is welded over the cutout area for S7G core basket applications.~~

6a. Date of Issuance:

6b. Expiration Date:

FOR THE U.S. DEPARTMENT OF ENERGY

7a. Address (of DOE Issuing Office)

Naval Reactors
U. S. Department of Energy
Washington, DC 20585

7b. Signature, Name and Title (of DOE Approving Official)

S. J. Trautman
Deputy Director, Naval Reactors

5. (Continued)

(2) S3G Core Basket Disposal Container

The S3G CBDC is an upright closed cylinder consisting of a 5.0-inch-thick bottom plate, an 8.0-inch-thick top plate (at the centerline) and a cylinder with an outer diameter of 89.0 inches and a 4.0-inch wall thickness. The top and bottom cover plates have a 105.0-inch diameter. The container is constructed of HY-80 steel and has an overall height of 142.5 inches (excluding lifting lugs).

The loaded S5W MCBRC is enclosed in the S3G CBDC for shipment. An inner and outer holddown ring are placed on top of the loaded S5W MCBRC prior to installing the S3G CBDC top plate. The outer holddown ring is 2.0 inches thick, has a 74.0-inch inside diameter and rests on top of the cylindrical shield. The inner holddown ring is also 2.0 inches thick, has a 45.75-inch inside diameter and rests on the top flange of the S5W MCBRC main container. Installation of the S3G CBDC top plate results in a 1/4-inch clearance between the top plate and the holddown rings.

The shipping weight of a loaded S3G CBDC is approximately 172,000 pounds. The container general assembly is shown on Bettis Drawing 1527E40 (for the S3G core basket) and KAPL Drawing 232B4874 (for the S7G core basket).

(3) S8G Irradiated Components

The S5W MCBRC is not used for shipment of S8G irradiated components. The S8G irradiated components are shipped using the S3G CBDC and the S8G Irradiated Components Discharge Rack (ICDR). The ICDR is a structure that is set within the S3G CBDC to receive the components being scrapped and to position and store them for transport to the disposal site. A central, heavy cylindrical structure of the ICDR provides additional shielding for 141 instrumentation lines that are stored within 9 tubes that are positioned within the shielded volume. The central shielding structure is comprised of an HY-80 steel cylinder of 36-inch outer diameter, 4.5-inch wall thickness, and 117-inch height with a 9.75-inch-thick carbon steel bottom plate and a 6-inch-thick carbon steel top plate. Outside of this central shielded volume are 23 storage tubes for storing the low source strength components (18 lower control drive mechanism assemblies, 4 fill sleeves, and 1 instrument stalk).

When all of the scrapped components have been loaded into the ICDR, the top plate of the CBDC is welded in place to complete the containment boundary and shipping package configuration.

The shipping weight of the S3G CBDC loaded with the S8G ICDR and scrapped components is 125,000 lbs. The general configuration of the irradiated components package is shown in KAPL Drawing 978E644.

b. Authorized Contents

(1) Type and form of materials

S3G: An irradiated S3G core basket with residual water and surface contamination in the form of the activated corrosion products. Radionuclides present include Pu-239 (trace amounts only), Sr-90, Co-60, Zr-95, Fe-55, Ni-63, Mn-54, Hf-181, Co-58, Cr-51, Fe-59, C-14, and Ni-59.

~~**S7G:** An irradiated S7G core basket and surface contamination in the form of activated corrosion products. Radionuclides present include Sr-90, Co-60, Zr-95, P-33, Fe-55, Ni-63, Mn-54, Hf-181, Co-58, Cr-51, Ni-59 and Fe-59.~~

5. (Continued)

S8G: Irradiated components (core instrumentation lines, lower control drive mechanism assemblies, fill sleeves, and instrument stalk) and surface contamination in the form of activated corrosion products. Radionuclides present include Co-60, Zr-95, Fe-55, Ni-63, Mn-54, Hf-181, Co-58, Cr-51, Ni-59, Fe-59, Nb-95 and C-14. Trace elements present include Nb-94, Cs-137, Sr-90, I-129, Se-79, Zr-93, Pu-239, Pu-240, Pu-241, Am-241, Cm-244 and Tc-99.

(2) Quantity of material in package

S3G: One irradiated core basket with up to 8 gallons of residual water. Surface contamination on the core basket and container inner surfaces is estimated to be no greater than 20.58 curies of the radionuclides listed in 5.b.(1) for S3G. The activation level of the irradiated core basket is estimated to be no greater than 131,000 curies of the radionuclides listed in 5.b.(1) for S3G.

~~S7G: One irradiated core basket. Surface contamination on the core basket is estimated to be no greater than 1.24 curies of the radionuclides listed in 5.b.(1) for S7G. The activation level of the irradiated core basket is estimated to be no greater than 244,000 curies of the radionuclides listed in 5.b.(1) for S7G.~~

S8G: One irradiated components discharge rack that positions and stores the irradiated components that are being scrapped (141 core instrumentation lines, 18 lower control drive mechanism assemblies, 4 fill sleeves, and 1 instrument stalk). Surface contamination on the irradiated components is estimated to be no greater than 65.57 curies of the radionuclides listed in 5.b.(1) for S8G. The activation level of the irradiated components is estimated to be no greater than 2,440 curies of the radionuclides listed in 5.b.(1) for S8G.

c. Criticality Safety Index (CSI)

N/A

d. Restrictions

(1) Shipment of an irradiated S3G core basket shall be made no earlier than 75 days after reactor shutdown.

~~(2) Shipment of an irradiated S7G core basket shall be made no earlier than 180 days after reactor shutdown.~~

~~(3)~~(2) Shipment of S8G irradiated components shall be made no earlier than 100 days after reactor shutdown.

~~(4)~~(3) Air transport of fissile material is not authorized.

5. (Continued)

e. References

None.

f. Additional Information

Nuclear Regulatory Commission:

Memorandum SCTC: RHO 71-9786, dated August 21, 1986, concurred that the S3G core basket disposal container containing an S3G core basket or an S1C core basket complies with the requirements of 10CFR71.

~~Memorandum SGTB: EPE 71-9786, dated October 30, 1987, concurred that the S3G core basket disposal container containing an S7G core basket complies with the requirements of 10CFR71.~~

Memorandum SGTB: NLO 71-9786, dated November 19, 1991, concurred that the S3G core basket disposal container containing the S8G irradiated components complies with the requirements of 10CFR71.

The S1C core basket was a previously authorized cargo.

The S7G core basket was a previously authorized cargo.