



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

NR:RR:JHKampen G#C24-02642
11 Jun 2024

Handle as UNCLASSIFIED when enclosures (1), (2) & (3) are removed.

John Lubinski
Director, Office of Nuclear Material Safety and Safeguards
Nuclear Regulatory Commission
Washington, DC 20555

S-6213 SHIPPING CONTAINER—SAFETY ANALYSIS REPORT FOR PACKAGING TO SUPPORT SHIPMENT OF S1B POWER UNIT; REQUEST FOR NUCLEAR REGULATORY COMMISSION REVIEW AND CONCURRENCE

Background: The S-6213 power unit shipping container (PUSC) is used to transport submarine power units (fully assembled and unirradiated cores). The S-6213 PUSC is certified as a Type B package for shipment of fissile and highly radioactive material. Compliance with Title 10, Code of Federal Regulations, Part 71 (10CFR71) is demonstrated through a safety analysis report for packaging (SARP). The S9G power unit in the S-6213 PUSC SARP with its Addendum evaluates the VIRGINIA Forward Fit (VAFF) core as authorized contents in the S-6213 PUSC.

Discussion: This letter forwards Revision Original of the S1B Power Unit in the S-6213 PUSC SARP, which evaluates adding the S1B Power Unit as new authorized contents for the S-6213 PUSC. The SARP demonstrates that the transport of an S1B power unit in the S-6213 PUSC meets the requirements of 10CFR71. Enclosure (1) provides a high level summary of the main conclusions of the SARP. Enclosure (2) provides an outline of the SARP. Enclosure (3) provides Revision Original of the SARP. Enclosures (1) and (2) are provided to aid NRC review of the SARP.

Request for Action: Naval Reactors requests NRC review and concurrence with the S1B Power Unit in the S-6213 PUSC SARP, Revision Original, provided in Enclosure (3). Enclosure (4) provides requested changes to the NRC Certificate of Compliance (CoC) for the S-6213 PUSC (USA/9186/B(U)F-96). To support planned shipments of S1B power units needed for COLUMBIA Class submarine construction,

RESTRICTED DATA
This document contains Restricted Data as defined in the Atomic Energy Act of 1954, as amended. Unauthorized disclosure is subject to administrative and criminal sanctions.

NOFORN: This document is subject to special export controls, and each transmittal to foreign governments or foreign nationals may be made only with the approval of Naval Sea Systems Command.

Classified By: J. H. Kampen - Naval Reactors Engineer

Derived From: DOE-DOD CG-RN1 Rev 3 Feb 1996, DOE OC

UNCLASSIFIED

2

NR:RR:JHKampen G#C24-02642

Naval Reactors requests NRC schedule their review to complete by February 1, 2025. Naval Reactors will schedule a review kickoff meeting with the NRC.

If you have any questions, please do not hesitate to call me at (202) 781-6315 or my manager, Nick Plate, at (202) 781-6034.

J. H. Kampen
Naval Reactors

Enclosures: (1) MAJOR CONCLUSIONS OF THE S1B POWER UNIT IN THE S-6213 PUSC SARP
(2) OUTLINE OF THE S1B POWER UNIT IN THE S-6213 PUSC SARP
(3) S1B POWER UNIT IN THE S-6213 POWER UNIT SHIPPING CONTAINER SAFETY ANALYSIS REPORT FOR PACKAGING, REVISION ORIGINAL
(4) REQUESTED CHANGES TO THE NRC CERTIFICATE OF COMPLIANCE FOR THE S-6213 PUSC, USA/9186/B(U)F-96, REVISION 21 (DRAFT)

NTK: PRNR-REC, PRNR-REP

Copy to (Electronic, without Enclosure (3) contents):

Distribution via ADSARS

General Manager, NNL (Thomas Sambolt)
Executive Manager, RS.Reactor Servicing (RS), NNL (Vince Pantloni)
Executive Manager, RSS.Reactor Servicing Systems (RSS), NNL (Matt Drewen)
Subdivision Technical Manager, RSS.Shipping Containers, NNL (Suzanne Fiscus)
Unit Technical Manager, RSS.New Fuel and Exams, NNL (Adam Brenneman)
Mechanical Engineer, RSS.New Fuel and Exams, NNL (Stephen Sacha)

Manager, NRLFO, NRLFO.Manager, NRLFO, NR (Jay Showman)

Hard Copy Distribution (with all enclosures):

Director, Division of Fuel Management, NMSS, NRC (S. Helton)

Chief, Storage and Transportation Licensing Branch, DFM, NMSS, NRC (Y. Diaz-Sanabria)

Senior Project Manager, STLB, DFM, NMSS, NRC (N. Devaser)

UNCLASSIFIED

ENCLOSURE (4)

**REQUESTED CHANGES TO THE NRC CERTIFICATE OF COMPLIANCE FOR THE
S-6213 PUSC, USA/9186/B(U)F-96, REVISION 21 (DRAFT)**

Enclosed are recommended changes to the NRC Certificate of Compliance, showing additions and deletions from the latest revision (Revision 20) of the certificate.

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

1. a. CERTIFICATE NUMBER 9186	b. REVISION NUMBER 20 21	c. DOCKET NUMBER 71-9186	d. PACKAGE IDENTIFICATION NUMBER USA/9186/B(U)F-96	PAGE 1	PAGES 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*)

U.S. Department of Energy
Division of Naval Reactors
Washington, DC 20858
- b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION
Safety Analysis for ~~Shipping S8G Power Units in the S-6213 Container, Revision 7, dated June 16, 1975, as supplemented; and Safety Analysis for Shipment of S6W Shipboard Power Units in the Model 2 S-6213 PUSC, 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 Nos.: Model 1, S-6213 Power Unit Shipping Container
Model 2, S-6213 Power Unit Shipping Container

- (2) Description ← Model 3, S-6213 Power Unit Shipping Container

A power unit shipping container (PUSC) for shipment of a power unit complete with control rods and control rod drive mechanisms installed.

Models 2 and 3 S-6213 PUSCs are

The Model 1 S-6213 PUSC consists of a carbon steel cylindrical shell approximately 9-1/4 feet in outside diameter by 39-1/2 feet long, including hemispherical steel end impact limiters, with 10-3/4-foot outside diameter central flanges joining the barrel and cover halves. The ~~Model 2 S-6213 PUSC is of the same design as the Model 1, except that the primary container material is HY-80 steel.~~ An internal pressure cap and seal ring are attached to the PUSC barrel flange. A power unit is supported in the PUSC by a centrally located thick circular steel plate (PU head) which is clamped between the central mating flanges of the PUSC and fastened by 94, 2-inch diameter high strength studs. The upper and lower extremities of the power unit cantilever into the barrel and cover halves without additional support. A shipping/lifting ring, a flange adapter, and a lower support adapter are installed in the container during shipment of the S9G shipboard power unit. ←

materials are HY-80 steel and HSLA-100 steel, respectively.

A lifting and shipping ring and a flange adapter are installed in the container during shipment of the S1B power unit.

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
9186	20 21	71-9186	USA/9186/B(U)F-96	2 OF	4

5.(a) Packaging (Continued)

(2) Description

The PUSC is shipped in the horizontal position on a support frame which is secured to a specially built flatbed rail car.

The weight of the PUSC, including frame and contents, is approximately 320,000 pounds for shipment of the S9G shipboard power unit. **and approximately 366,700 pounds for shipment of the S1B power unit.**

(3) Drawings

The Model 1 and Model 2 S-6213 PUSC are constructed in accordance with the drawings included in the applications (see references, below).

5.(b) Contents

(1) Type and form of material

Unirradiated S9G power unit containing the Virginia Forward Fit Core, as described in supplement dated June 22, 2015.

(2) Maximum quantity of material per package **Unirradiated S1B power unit, as described in supplement dated June 11, 2024**

For the Model 1 S-6213 PUSC:

One S9G Power Unit containing Virginia Forward Fit Core.

For the Model 2 S-6213 PUSC:

One S9G Power Unit containing Virginia Forward Fit Core. **or one S1B Power Unit.**

5.(c) Criticality Safety Index (CSI):

Minimum CSI to be shown on label for nuclear criticality control: 100 **For the Model 3 S-6213 PUSC: One S1B Power Unit**

6. All control rods shall be restrained in the power unit fuel cells by the control rod hold down latches.

7. Transport by air of fissile material is not authorized.

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
9186	20 21	71-9186	USA/9186/B(U)F-96	3 OF	4

8. For the Model 1 S-6213 PUSC, a nondestructive examination of the entire length of both inner and outer surfaces of the four tie-down support bracket-to-container wall butt welds shall be conducted prior to each loaded shipment.

(a) The nondestructive examination in accordance with a written procedure may be by either:

(1) The liquid penetrant method in accordance with:

- (i) Article 6, section V, ASME code, or
- (ii) MIL-STD-271E, "Nondestructive Testing Requirements for Metals," section 5, October 31, 1973, or
- (iii) NAVSHIPS 250-1500-1, "Welding Standard," section 12.5

(2) or the magnetic particle method in accordance with:

- (i) Article 7, section V, ASME code (Yoke Technique; Dry Particle Method; direct or rectified current), or
- (ii) MIL-STD-271E, section 4; specifically 4.3.1 (General) and 5.6.1 (coatings), 4.3.3 (Dry Powder), 4.3.3.3.6 (Continuous), and 4.3.3.3 (Procedure) as excepted by using direct or rectified current, 4.3.3.3.3 (Yoke Technique), 4.3.2.5 (sensitivity and cleaning), and 4.3.1.3 (smoothness), or
- (iii) NAVSHIPS 250-1500-1, Section 12.4, 12.4.1 (General), 12.4.3 (Dry powder), 12.4.3.3.2.1 (Yoke Technique) using direct or rectified current.

(b) If any indications, as defined in accordance with either:

- (1) Paragraph UA-93(a), appendix VIII, division 1, section VIII, ASME code (with 7(b)(2)(i), above), or
- (2) Paragraphs UA-72 and UA-73, appendix VI, division 1, section VIII, ASME code (with 7(b)(2)(i), above), or
- (3) Class 1 acceptance criteria of NAVSEA 0900-LP-003-8000, "Surface Inspection Acceptance Standards for Metal," with change 2, July 1, 1974 (with 7(b)(1)(ii) or 7(b)(2)(ii), above), or
- (4) NAVSHIPS 250-1500-1, section 10.3.2 (with 7(b)(1)(iii) or 7(b)(2)(iii), above), as noted,

are detected, the packaging shall be repaired and reinspected prior to use and shall be inspected prior to each shipment thereafter. Any defects shall be reported in accordance with 10 CFR §71.95.

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
9186	20 21	71-9186	USA/9186/B(U)F-96	4	OF 4

9. Expiration date: July 31, 2028.

REFERENCES

For the Model 1 S-6213 PUSC:

U.S. Naval Reactors application dated July 24, 1975.

Supplements dated: June 3, 1977; July 24, 1978; Naval Reactors letter G#C89-2838, dated May 22, 1989; Naval Reactors letter G#C90-03664, dated September 5, 1990; Naval Reactors letter G#92-03563, dated June 17, 1992; and Naval Reactors letter G#C92-03714, dated October 2, 1992; Naval Reactors letter G#97-03425, dated February 7, 1997; Naval Reactors letter G#C97-03614, dated September 29, 1997; Naval Reactors letter G#01-03619, dated December 11, 2001; Naval Reactors letter G#06-04833, dated December 18, 2006; Naval Reactors letter G#C08-00667, dated March 13, 2008; Naval Reactors letter G#11-04084, dated September 20, 2011; Naval Reactors letters G#C15-02760 dated June 22, 2015, and G#C01632 dated April 13, 2016; Naval Reactors letter G#16-04427, dated September 20, 2016; Naval Reactors letter G#C18-02888, dated June 13, 2018; Naval Reactors letter G#22-00013, dated January 18, 2022; and Naval Reactors Letter G#22-05956 dated December 28, 2022.

For the Model 2 S-6213 PUSC:

U.S. Naval Reactors application G#C91-11165, dated December 19, 1991.

Supplements dated: Naval Reactors letter G#92-03563, dated June 17, 1992; and Naval Reactors letter G#C92-03714, dated October 2, 1992; Naval Reactors letter G#97-03425, dated February 7, 1997; Naval Reactors letter G#C97-03614, dated September 29, 1997; Naval Reactors letter G#01-03619, dated December 11, 2001; Naval Reactors letter G#06-04833, dated December 18, 2006; Naval Reactors letter G#C08-00667, dated March 13, 2008; Naval Reactors letter G#11-04084, dated September 20, 2011; Naval Reactors letters G#C15-02760 dated June 22, 2015, and G#C01632 dated April 13, 2016; Naval Reactors letter G#16-04427, dated September 20, 2016; Naval Reactors letter G#C18-02888, dated June 13, 2018; Naval Reactors letter G#22-00013, dated January 18, 2022; Naval Reactors Letter G#22-05956 dated December 28, 2022, and G#C24-02642 dated June 11, 2024.

For the Model 3 S-6213 PUSC:
U.S. Naval Reactors application
G#C24-02642 dated June 11, 2024.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION



Signed by Diaz-Sanabria, Yoira
on 09/08/23

Yoira K. Diaz-Sanabria, Chief
Storage and Transportation Licensing Branch
Division of Fuel Management
Office of Nuclear Material Safety
and Safeguards

Dated: September 8, 2023