

~~Security Related Information~~
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DEPARTMENT OF ENERGY
NATIONAL NUCLEAR SECURITY ADMINISTRATION
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WASHINGTON DC 20585-1000

NR:RR:NSPlate G#23-02364
15 June 2023

Enclosure (2) transmitted herewith contains sensitive, unclassified information.
The document is decontrolled upon removal of Enclosure (2).

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

S-6213 POWER UNIT SHIPPING CONTAINER — SAFETY ANALYSIS REPORT FOR
PACKAGING OF S9G POWER UNITS; RESPONSE TO NRC REQUEST FOR
ADDITIONAL INFORMATION

References: (a) NR letter G#C22-05956 dated December 28, 2022
(b) NNL meeting summary RSS-SC-NFE-00085 dated April 19, 2023

Background:

a. 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 Type B package requirements in Title 10, Code of Federal Regulations, Part 71 (10CFR71) is demonstrated through a safety analysis report for packaging (SARP). In the reference (a) letter, Naval Reactors forwarded an addendum to the S9G power unit in the S-6213 PUSC SARP for NRC review and concurrence. The SARP addendum addresses aspects of the package that changed as a result of an internal pressure cap design modification. As documented in the reference (b) meeting summary, Naval Reactors, NRC, and Naval Nuclear Laboratory conducted meetings with NRC staff to facilitate the review. Subsequently, NRC provided Naval Reactors a request for additional information in a letter dated May 18, 2023 (Docket No. 71-9186; EPID No. L-2023-LLA-0000) to resolve open questions.

Naval Reactors Action: Enclosure (1) to this letter provides the Naval Reactors response to the NRC request for additional information (Docket No. 71-9186; EPID No. L-2023-LLA-0000). Naval Reactors appreciates the NRC's thorough and timely review of the application and if you have any questions, please do not hesitate to call or email me at (202) 781-6034 or nicholas.s.plate.civ@us.navy.mil.

N. S. Plate
Naval Reactors

Enclosures and Copy to: see next page.

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Enclosures: (1) NAVAL REACTORS RESPONSES TO NRC REQUEST FOR
ADDITIONAL INFORMATION [DOCKET NO. 71-9186; EPID NO. L-
2023-LLA-0000]
(2) DRAWING 6359E12

NTK: NAVY-REC, NAVY-REP, PRNR-REC, PRNR-REP

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ENCLOSURE (1)

NAVAL REACTORS RESPONSES TO NRC REQUEST FOR ADDITIONAL INFORMATION [DOCKET NO. 71-9186; EPID NO. L-2023-LLA-0000]

This enclosure restates the NRC Request for Additional Information provided in a letter dated May 18, 2023 and provides the Naval Reactors response following each question.

STRUCTURAL

2.1 Provide the information necessary to demonstrate how the proposed change to the S-6213 PUSC package design complies with the performance requirements for normal conditions of transport for the penetration test specified in Title 10 of the Code of Federal Regulations (10 CFR) 71.71(c)(10).

For normal condition of transport, 10 CFR 71.71(c)(10) requires the package to be evaluated for the impact of a vertical steel cylinder of 1.25 in diameter, that weighs 13 lbs, and is dropped from a height of 40 in onto the exposed surface of the package that is expected to be most vulnerable to puncture. Section 2.6.10 of the safety analysis report states that this requirement was shown to be satisfied for Model 1 and Model 2 container designs of the S-6213 PUSC package in the two referenced SARs associated with the S6W power units. However, considering the change in design, it is not clear how this penetration test requirement was evaluated for the proposed S-6213 PUSC package design and its content. The guidance in NUREG-2216 describes, in part, the information necessary to demonstrate compliance with the regulation and includes the acceptance criteria used during for review.

The above information is necessary to comply with 10 CFR 71.71(c)(10), 71.43(f) and 71.55(d).

Naval Reactors Response

The analyses referenced in Section 2.6.10 [Reference A1-1] evaluate the Model 1 and Model 2 container designs of the S-6213 PUSC package with respect to the 10 CFR 71.71(c)(10) penetration test. The analyses conclude that the penetration test would not affect the package in any significant manner (e.g., ~0.002 inch deep dent). Section 2.6.10 is applicable to the S9G/VAFF package configuration since these analyses are independent of specific package cargo.

Section A1.0 of addendum states that "...Any S9G/VAFF related sections of Reference A1-1 not specifically addressed herein are considered still applicable unless stated otherwise." The internal pressure cap design modification did not result in changes to exterior package features that would alter or challenge the analyses referenced in Section 2.6.10. Therefore, the addendum did not address Section 2.6.10 and the analyses and conclusion in Section 2.6.10 remain applicable for the S-6213 PUSC configuration with the internal pressure cap modification.

MATERIAL

7.1 Justify the absence of information pertaining to welding specifications (including location and nondestructive examination) in the new pressure cap replacement kit drawings provided in safety analysis report Appendix A1.4.

Design basis drawings need to provide welding and examination requirements for important to safety components to ensure the fabrication of the package is described in sufficient detail to establish a basis for evaluation, the fabrication is in accordance with established codes and standards to ensure quality assurance, and the fabrication is such that under normal conditions of transport there would be no substantial reduction in the effectiveness of the packaging.

The above information is necessary to comply with 10 CFR 71.31(c), 71.33(a) and 71.43(f).

Naval Reactors Response

Information related to welding specifications, including examination, are provided in Appendix A1.4 drawings for the internal pressure cap hardware. The pressure cap (Drawing 6359E12) is the only component, as part of the internal pressure cap modification, which specifies welding for fabrication. Welder and welding procedure qualification for the pressure cap are in accordance with Section IX of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code. Charpy V-Notch testing requirements related to weld qualification are as identified in Section A2.10.14.1 of Appendix A2.10.14 to Chapter A2. Non-destructive examination requirements are in accordance with the #5 specification drawing referenced on the pressure cap drawing.

Naval Reactors has concluded that for clarity of SARP documentation it is preferred to consolidate and present all welding requirements directly in Drawing 6359E12 as documented in Enclosure (2). Drawing 6359E12 as documented in Enclosure (2) will replace the current version of the SARP drawing as submitted to the NRC.