

January 27, 2014

Mr. Barry K. Miles
Division of Naval Reactors
U.S. Department of Energy
Washington, D.C. 20585

SUBJECT: APPLICATION FOR THE MODEL NO. M-290 TRANSPORT PACKAGE –
REQUEST FOR ADDITIONAL INFORMATION (TAC NO. L24755)

Dear Mr. Miles:

By letter dated May 13, 2013, you submitted an application for approval of Certificate of Compliance No. 9352, for the Model No. M-290 transport package. The application, which consists of the core independent safety analysis report, proposes using the M-290 package to transport naval reactors spent fuel.

In connection with our review, we need the information identified in the enclosure to this letter. Additional information requested by this letter should be submitted in the form of revised safety analysis report pages.

Please reference Docket No. 71-9352 and TAC No. L24755 in future correspondence related to this request. The staff is available to meet to discuss your proposed responses. If you have any questions regarding this matter, please contact me at (301) 287-0810.

Sincerely,

/RA/

Bernard H. White, Senior Project Manager
Licensing Branch
Division of Spent Fuel Storage and Transportation
Office of Nuclear Material Safety
and Safeguards

Docket No. 71-9352
TAC No. L24755

Enclosure: Request for Additional Information

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NAVAL REACTORS

DOCKET NO. 71-9352

REQUEST FOR ADDITIONAL INFORMATION

MODEL NO. M-290 APPLICATION

By application dated May 13, 2013, Naval Reactors submitted an application for approval of Certificate of Compliance No. 9352, for the Model No. M-290 transportation package. This request for additional information identifies information needed by the U.S. Nuclear Regulatory Commission (NRC) staff in connection with its review of the application. The requested information is listed by chapter number and title in the safety analysis report (SAR). The staff used the guidance provided in NUREG-1617, "Standard Review Plan for Transportation Packages for Spent Nuclear Fuel," in its review of the application.

Each question describes information needed by the staff for it to complete its review of the application and to determine whether the applicant has demonstrated compliance with regulatory requirements.

Chapter 2 – Structural Evaluation

- 2-1 Provide the version year for the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME B&PV Code).

Identification of the Codes and Standards for package design included the designation of ASME B&PV Code Section III, Division I, Subsection NB or NF, as the design code used. This reference is not provided in the listed references for Chapter No. 2, and subsequently, no version year is identified.

This information is needed to determine compliance with Title 10 of the *Code of Federal Regulations* (10 CFR) 71.31(c).

- 2-2 Provide a summary table indicating the use of more restrictive Naval Nuclear Propulsion Program (NNPP) standards including the justifications for those substitutions over consensus standards.

The following text is provided in the SAR:

“...are fabricated, examined, and tested in accordance with the ASME Code B&PV Section I, Div. III, Subsection NB or NF **(and standard NNPP requirements when those requirements are more restrictive than ASME Code requirements)**” (emphasis added).

This information is needed to determine compliance with 10 CFR 71.31(c).

- 2-3 Revise Table 2.1-1 on page 2.1-5 to accurately describe the strain limits on various components during normal conditions of transport.

The table indicates that no yielding is allowed for the top and bottom domes, which is inconsistent with their function and subsequent analysis results. Furthermore, various results presented for other components show accumulated plastic strains when the limit indicates that no yielding is allowed.

This information is needed to determine compliance with 10 CFR 71.71.

- 2-4 Provide a summary table in the safety analysis report for the 1-foot drop analyses comparing component stresses with allowable stresses.

Section 2.6.1, "Heat," provides summary tables showing stresses due to loading(s) as well as allowable stresses for various package components. The NRC staff requests that these same summary tables be provided for the normal conditions of transport drop evaluations.

This information is needed to determine compliance with 10 CFR 71.71.

Chapter 4 – Containment Evaluation

- 4-1 Clarify how the amount of the residual water that remains in the package after loading was determined and address the potential hydrogen generated in the package. Show that the resulting hydrogen concentration is less than 5 percent by volume.

The applicant stated in Section No. 2.6.2.6 that the M-290 may contain up to 8 gallons of residual water after draining of the water introduced during package loading and stated in Section No. 4.2.2 that the internal pressure calculation considers the vapor pressure induced by the 8 gallons of residual water. It is unclear how this value was determined and whether any associated radiolysis would produce more than 5 percent hydrogen concentration by volume.

This information is needed to determine compliance with 10 CFR 71.43(d).

- 4-2 Justify that the residual water, remaining in the M-290, will be prevented from flowing to the containment cover seal and will have no adverse effect on the containment components.

The applicant stated in Section No. 2.6.2.6 that during shipment, some residual water may flow towards the upper end of the package as the railcar travels downhill or brake suddenly, but the mitigation of any water to the containment cover seal will be prevented by the closure head or the canister restraint under normal conditions of transport.

The applicant should provide a schematic drawing (including the potential passages to the cover seal) to (a) justify that the water movement will be blocked by either the closure head or the canister restraint, and (b) show that there are no other potential water passages to the containment cover seal. This is to assure that the freezing of residual water has no effect on the cover seal and other containment components.

This information is needed to determine compliance with 10 CFR 71.33 and 71.43(f).

- 4-3 It is not clear that the methods proposed to perform the fabrication, maintenance, periodic, and pre-shipment leakage rate tests will ensure that the package will meet the

containment regulations in 10 CFR Part 71. The applicant should verify that all leak test criteria, procedures and methods, required by ASME B&PV Code, are equivalent to those required by American National Standards Institute (ANSI) N14.5-1997, "Radioactive Materials - Leakage Tests on Packages for Shipment."

The applicant indicated in Chapter Nos. 4 and 7 that the fabrication, maintenance, periodic, and pre-shipment leakage rate tests will be performed in compliance with ASME B&PV Code instead of the ANSI N14.5.

This information is needed to determine compliance with 10 CFR 71.43(f) and 71.51.

Chapter 7 – Operating Procedures

- 7-1 Justify whether the helium mass spectrometer test (hood technique) is identical or equivalent in effectiveness to the gas filled envelope test (gas detector/hood technique) in determining the leakage rate of the package.

The applicant indicated in Chapter No. 7 that the helium mass spectrometer test - hood technique of ASME B&PV Code is used for the leakage rate testing. The staff needs to know whether this specific test method is equivalent to the gas filled envelope test – gas detector/hood technique specified in ANSI N14.5. The staff needs this information to justify whether the helium mass spectrometer test is effective for the leakage rate testing on the M-290 package.

This information is needed to determine compliance with 10 CFR 71.87.

- 7-2 Revise the procedures for the fabrication, maintenance, periodic, and pre-shipment leak rate tests to provide the helium fill pressures and the test periods.

The applicant should provide the helium fill pressures and the test periods required for fabrication, maintenance, periodic, and pre-shipment leakage rate tests to ensure complete procedures for the users to follow.

This information is needed to determine compliance with 10 CFR 71.43(f) and 71.87.