Request for Additional Information Nuclear Waste Partnership Docket No. 71-9279 Certificate of Compliance No. 9279 Model No. HalfPACT

By letter dated February 15, 2023 [Agencywide Documents Access and Management System (ADAMS) Accession Number ML23046A454] Salado Isolation Mining Contractors (the applicant), on behalf of the U.S. Department of Energy, submitted a request to the U.S. Nuclear Regulatory Commission (NRC) for the review of an application for a letter authorization for the Model No. HalfPACT. The NRC was requested to approve a one-time shipment of a HalfPACT package from the Waste Isolation Pilot Plant to the Savanna River Site because the 5-year maintenance certification of the package in question had expired. The applicant proposed using the outer containment assembly of another HalfPACT Unit as its authorized content and credit the outer confinement vessel as the package's containment boundary. Currently, this configuration is not approved in CoC No. 9279.

This request for additional information (RAI) identifies information needed by the NRC staff in connection with its review of the application. The requested information is listed by chapter number and title in the application. The NRC staff used NUREG-2216, "Standard Review Plan for Transportation Packages for Spent Fuel and Radioactive Material: Final Report," 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.

STRUCTURAL EVALUATION (St)

- RAI-St-1 Provide the information listed below to supplement appendix F, report No. HPT-CAL-0001, "Loaded HalfPACT ICV Lifting Evaluation," submitted as part of the application:
 - a. Include the pertinent information from section 3.1.4 of "PDD PT00" in report No. HPT-CAL-0001. Document "PDD PT00" is mentioned on the cover sheet of the report but is not referenced.
 - b. Justify the exclusion of normal conditions of transport (NCT) effects of decay heat, environmental thermal, and internal pressure for the structural evaluation of internal containment vessel (ICV) lid lifting sockets and pins during transfer lift conditions.
 - c. Provide a description of the anticipated location and ambient conditions during the transfer lift of the ICV from the old outer confinement vessel (OCV) to the new one.
 - d. Justify the use of Type 304 stainless steel material properties in the transfer lift evaluation, which appears to have been taken from the 70°F entry on table 2.3-1 of the safety analysis report (SAR), revision 9.

- e. Provide a reference for the ICV 506 payload weight and include it in the report.
- f. Justify the addition of the simulated ICV payload "weight" of a 5,485 pounds (lbs.) to the ICV self-weight of 2,215 lbs. to determine the gross allowable lifting capacity of 7,700 lbs.
- Include the pertinent information from report reference No. 10 in Report No. HPT-CAL-0001 as part of the report content: Washington TRU Solutions 412-L-082, Revision E, "Adjustable Center of Gravity Lift Fixture (ACGLF) Leg Weldment & Miscellaneous Details; Lift Leg Weldment."
- h. Identify the source of the lifting pin groove locations and widths, as well as pin minimum through-thickness at these locations.

The staff notes that the guidance in section 2.4.10 of NUREG-2216 notes that copies of applicable references, if not generally available to the viewer, should be included in the review package. The staff is not familiar with "PDD PT00" or the Washington TRU Solutions document 12-L-082. The latter is needed to verify the method of loading assumed for the lifting pins. In addition, a source for the payload weight of the ICV should be cited in the report to allow verification of a key input parameter for the lifting condition evaluation. The staff notes that revision No. 9 of the table 2.2-1 of the SAR provides the ICV self-weight; cite as a reference.

The ICV is sealed and contains a payload of radioactive material. The staff expects that some decay heat and internal pressure are present at the time of the ICV lift and transfer from the old to the new OCV. Nevertheless, the application does not include a description of the anticipated location and ambient conditions during the transfer. Therefore, the applicant must justify the omission of decay heat, environmental thermal effects, operating pressure, and use of material properties associated with 70°F in the evaluation of the lid stress during lifting.

An outdoor transfer may present environmental conditions such as increased ambient temperature and insolation. Per section 3.0 of the SAR, revision 9, the maximum ICV decay heat is 30 watts and per section 3.4.4.3, the ICV maximum normal operating pressure is 50 pounds force per square inch gauge (psig). Maximum temperatures for the ICV determined from thermal analysis of decay heat and insolation conditions are shown in table 3.1-1 of the SAR, rev. 9. section 2.1.2 of the SAR indicates that container allowable stresses are determined employing the load combination guidance of Regulatory Guide 7.8, "Load Combinations for the Structural Analysis of Shipping Casks for Radioactive Material."

In report section 3.2, the allowable OCV lid stress during lifting conditions is determined to be 10,000 psi. The applicant needs to justify the determination of allowable lifting load capacity in report section 4.2.1 as the addition of the self-weight of 2,215 lbs. (resulting in a Von Mises' stress of over 2,800 psi, per figure 6) and the payload "weight" of 5,485 lbs. (resulting in a Von Mises' stress of almost 10,000 psi, per figure 7).

Report No. HPT -CAL-0001, section 4.2.2 presents a finite element analysis (FEA) of an individual lifting pin based on its geometry and assumed load application points. From Drawing No. 707-SAR, revision 12, the staff is unable to determine the exact location, width, and depth of the grooves on the lifting pins as stated in this report section and reflected in the FEA. Therefore, the applicant must provide references for this geometrical information. Since the locations of load application to the pin are stated in the report as being based on information for the ICV lift fixture presented in Washington TRU Solutions, 412-L-082, Revision E, the applicant also needs to provide the pertinent portions of this reference in the report.

This information is necessary to demonstrate compliance with the regulatory requirements in 10 CFR 71.43(f), 71.45(a), and 71.51(a).

OPERATING PROCEDURES

OP-7-1 Clarify in the application section 7.4.4.1, step 2; section 7.4.4.2, step 2; section 8.1.3.5, step 3; section 8.1.3.6, step 2; section 8.1.3.7, step 2; and section 8.2.4.3 that, in addition to the assembly requirements as shown in appendix 1.3.1, "Packaging General Arrangement Drawings," of the HalfPACT SAR, the O-ring seals must meet the requirements of section 4.1.1.1 of this application.

Specifically, section 4.1.1.1 of the application describes requirements for the innermost main O-ring seal of the OCV and the OCV vent port plug O-ring seal that are in addition to the requirements in appendix 1.3.1 of the HalfPACT SAR. Both O-ring seals must be important-to-safety Category A butyl rubber.

This information is needed to determine compliance with the regulatory requirements in 10 CFR 71.87 and 71.51.