

## **Preliminary Request for Additional Information (RAI)**

**Docket No. 71-9279**

**DOE**

**Certificate of Compliance No. 9279 for HalfPACT**

**One-time shipment**

### **RAI 2-1**

Provide the additional information listed below to supplement that presented in Appendix F, report HPT-CAL-0001, "Loaded HalfPACT ICV Lifting Evaluation," which was included as part of the letter titled "Request for Authorization of One-Time Shipment of Model No. HalfPACT Crediting the Outer Confinement Vessel as the Containment Boundary" (ADAMS accession no. ML23046A454):

- (a) Include the pertinent information from section 3.1.4 of "PDD PT00" as part of the report content. This document 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 deg. 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 in the report.
- (f) Justify the addition of the simulated ICV payload "weight" of a 5485 lbs. to the ICV selfweight of 2215 lbs. to determine the gross allowable lifting capacity of 7700 lbs.
- (g) Include the pertinent information from report reference 10, Washington TRU Solutions 412-L-082, Rev. E, "Adjustable CG Lift Fixture," as part of the report content.
- (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 states 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 of which is needed to verify the method of load application assumed for the lifting pins. In addition, a source for the payload weight of the inner containment vessel should be cited in the report to allow verification of a key input parameter for the lifting condition evaluation. Staff notes that Ref. 9 SAR table 2.2-1 provides the ICV selfweight; cite as a reference.

As the ICV is sealed and contains a payload of radioactive material, 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 outer containment vessel (OCV). Describe the anticipated location and ambient conditions during the transfer; an outdoor transfer may present environmental conditions such as increased ambient temperature and insolation. Per the Rev. 9 SAR section 3.0, the maximum ICV decay heat is 30 W and per the section 3.4.4.3, the ICV maximum normal operating pressure is 50 psig. Maximum temperatures for the ICV determined from thermal analysis of decay heat and insolation conditions are shown in the Rev. 9 SAR table 3.1-1. SAR section 2.1.2 indicates that container allowable stresses are determined employing the load combination guidance of Regulatory Guide 7.8. Justify the omission of decay heat, environmental thermal effects, operating pressure and use of material properties associated with 70 deg. F in the evaluation of the lid stress during lifting.

In report section 3.2, the allowable OCV lid stress during lifting conditions is determined to be 10,000 psi. Justify the determination of allowable lifting load capacity in report section 4.2.1 as the addition of the selfweight of 2215 lbs. (resulting in a Von Mises' stress of over 2800 psi, per Figure 6) and the payload "weight" of 5485 lbs. (resulting in a Von Mises' stress of almost 10,000 psi, per Figure 7).

Report 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 the Rev. 12 707-SAR drawings, 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; provide references for this geometrical information. 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, Rev. E; provide the pertinent portions of this reference in the report.

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

## DOE HalfPACT Review - Ops RAIs (Chapter 7)

### **Operating Procedures**

- 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 shall 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 10 CFR 71.87 and 71.51.