



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION REPORT

**Model No. HalfPACT, Docket No. 71-9279
Certificate of Compliance No. 9279
Revision 11**

**Model No. TRUPACT-II, Docket No. 71-9218
Certificate of Compliance No. 9218
Revision 27**

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SUMMARY

By letter dated August 18, 2022 (NWP, 2022a), and supplemented on October 10, 2022 (NWP, 2022b); Nuclear Waste Partnership LLC (NWP, the applicant thereafter), on behalf of the U.S. Department of Energy, submitted applications to revise Certificate of Compliance (CoC) No. 9218 for the Model No. TRUPACT-II package (TRUPACT-II) and CoC No. 9279 for the Model No. HalfPACT package (HalfPACT). The applicant requested revising drawings of these packages as summarized on Appendix A of the August 18, 2022, submittal. Changes to the drawings will:

- 1) allow adding optional materials and processes for repairing or replacing, as necessary, the OCV vent port access tube
- 2) ensure free and clear access to the OCV vent port during normal operations

The CoCs will reference the consolidated application dated October 10, 2022 (NWP, 2022b).

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the application, including its supplement, using the guidance in NUREG-2216, "Standard Review Plan for Transportation Packages for Spent Fuel and Radioactive Material" (NRC, 2020). Based on the statements and representations in the application, as supplemented, and the conditions listed below, the staff concludes that the packages meet the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 71, "Packaging and Transportation of Radioactive Material."

1.0 GENERAL INFORMATION EVALUATION

The objective of this general information evaluation is to verify that the applicant has provided an adequate description of the package to familiarize reviewers with the pertinent features of package. The drawings provided by the applicant, as these pertain to the proposed changes to the packages' Model Nos. TRUPACT-II and HalfPACT are sufficiently detailed and consistent with the package description to provide reasonable assurance that the transportation package can meet the regulations.

1.1 Purpose of the application

The purpose of this application is to revise drawing Nos. 2077-500SNP, “TRUPACT-II Packaging SAR Drawing,” and 707-SAR, “HalfPACT Packaging SAR Drawing,” to address degradation of the fiberglass tube (also refer as the OCV vent port tube in this SER) seen during inspections of the TRUPACT-II and HalfPACT packagings (NWP, 2022a). The applicant requested adding alternative materials and processes for repairing the OCV vent port tube.

1.2 Package Design Information

1.2.1 Packaging

The applicant proposed changes to the packaging design of the Model Nos. TRUPACT-II and HalfPACT packages to address degradation of the tube that provides a pathway through the poured-in-place polyurethane foam for access to the OCV vent port.

1.2.2 Contents

The applicant did not request changes to the contents of the package.

1.3 Drawings

The applicant revised the following drawings for the Model Nos. TRUPACT-II and HalfPACT:

- a) Drawing No. 2077-500SNP, “TRUPACT-II Packaging SAR Drawing”
- b) Drawing No. 707-SAR, “HalfPACT Packaging SAR Drawing”

The staff reviewed the changes to these drawings and found them acceptable. The staff evaluated the changes to the drawings in Section 7.0 of this safety evaluation report (SER).

1.4 Evaluation Findings

The staff reviewed documentation provided by the applicant including package and packaging descriptions as well as design drawings to verify that statements presented by the applicant are acceptable for the review and approval of the revision of the CoCs for the Model Nos. TRUPACT-II and HalfPACT packages, as required by 10 CFR 71.33. Based on the review of the statements and representations provided by the applicant, the staff concludes that the package, packaging, and contents have been adequately described to meet the requirements of 10 CFR Part 71.

2. STRUCTURAL EVALUATION

The staff reviewed the proposed changes to the TRUPACT-II and HalfPACT shipping packages to verify if a structural evaluation was necessary for the proposed changes in order to comply with the regulatory requirements of 10 CFR Part 71.

2.1 Structural Design

Section 1 includes a description of the changes proposed by the applicant in the CoC revisions requests for the TRUPACT-II and HalfPACT packages. The proposed changes are related to the OCV vent port access tube shown in Section H-H on Sheet 4 of Drawing No. 2077-500SNP and Sheet 5 of Drawing 707-SAR. The tube is located outside of the primary containment boundary.

Based on the description of the changes provided in the application and its supplement as well as the function and location of the vent port tube, the staff determined that the Category C for this item is on alignment with NUREG-6407, "Classification of Transportation Packaging and Dry Spent Fuel Storage System Components According to Importance to Safety," (NRC, 1996). Therefore, the packages should maintain their structural integrity of the packages during normal and accident conditions as defined in 10 CFR Part 71. Sections 4 and 7 of this SER include the staff's evaluation of the important to safety category of the tube.

2.2 Evaluation Findings

Based on a review of the statements and representations in the application related to the proposed changes, the staff concludes that the previously approved structural design is not impacted by the proposed changes and that assigning a Category C to the OCV vent port access tube was adequate. Therefore, the staff finds that the current structural evaluations are adequate and meet the structural requirements of 10 CFR Part 71.

4. CONTAINMENT EVALUATION

The objective of the NRC's containment evaluation is to verify that the applicant has adequately evaluated the performance of transportation packages for radioactive material and that the packages (packaging together with any contents) meet the containment requirements in 10 CFR Part 71.

4.1 Containment Design

The proposed changes described in Section 1 of this SER focuses on addressing degradation of the fiberglass tube that serves as a passageway through the poured-in-place polyurethane foam. The tube is outside of the primary containment boundary and provides access to the OCV vent port.

The applicant currently categorizes the OCV vent port access tube as a Category C item (NWP, 2022a). Based on the guidance in NUREG-6407 a Category C important to safety item is described as having a minor impact on safety as follows:

"Category C items include structures, components, and systems, whose failure or malfunction would not significantly reduce the packaging effectiveness and would not be likely to create a situation adversely affecting public health and safety."

The staff finds acceptable assigning a category C to the tube, since the changes proposed by the applicant to the packaging design do not change the safety function of the tube.

4.2 Evaluation Findings

Based on review of the statements and representations in the application, the staff concludes that the Model Nos. TRUPACT-II and HalfPACT packages have been adequately described and evaluated to demonstrate that they satisfy the containment requirements of 10 CFR Part 71.

7. MATERIALS EVALUATION

The staff reviewed the applicant's proposed changes to the TRUPACT-II and HalfPACT package designs to verify that applicant performed an acceptable evaluation with respect to materials to demonstrate that these packages meet the requirements of 10 CFR Part 71 under NCT and HAC.

The staff's materials review focused on materials topics relevant to the proposed change, specifically the drawing revisions to add alternative materials and processes to address degradation observed in the OCV vent port fiberglass tube. The aspects of other packaging components, unless specifically named in this evaluation, are bounded by the conditions previously evaluated by the staff in prior reviews of the TRUPACT-II and HalfPACT packages and are thus not evaluated further in this review.

7.1 Evaluation of Materials of Package's Designs and Proposed Content

Section 1 of this SER includes a summary of the changes proposed by the applicant to the TRUPACT-II and HalfPACT packages. The staff verified that the proposed revisions to the package do not expose the proposed packaging materials to thermal, structural, or corrosive service environments more severe than those that have been previously evaluated for the existing packaging.

The staff concludes that the materials evaluation for these packages satisfies the requirements for 10 CFR Part 71 and is acceptable.

7.1.1 Drawings

The staff reviewed the drawing changes associated with Revision 26 of the TRUPACT-II safety analysis report (SAR or application) and Revision 9 of the HalfPACT SAR. Specifically, Note 33 and Section H-H were revised on Drawing Nos. 2077-500SNP and 707-SAR, for the TRUPACT-II and HalfPACT, respectively. Note 33 changed to describe the tube as non-metallic instead of fiberglass and indicated the tube was optional after foam pour (a polymer resin surface coating is permitted in lieu of the tube, as specified in the revised note). Section H-H removed a specified length and the fiberglass material designation.

The staff reviewed the applications for context into the functions of this tube credited in the application and any other related references. The application does not include a discussion about specific functions of the tube, but access to the ports is described in the surrounding text. The applicant further described the functions of the OCV vent port access tube, including those secondary non-safety-significant functions, such as minimizing potential particulates from the exposed foam which would require subsequent cleaning of the vent port. The staff additionally confirmed the compatibility of the surrounding materials with both the non-metallic tube and the polymer resin surface coating. The staff concluded that the information provided in the revised

drawing remained sufficient as it adequately described the attributes of the package as outlined in NUREG-2216.

7.1.2 Material Properties

Section 2.4.4 addresses chemical and galvanic reactions to satisfy the requirements of 10 CFR 71.43(d). Materials used in packaging are not expected to have significant chemical, galvanic, or other reactions in air, inert gas, or water environments. The staff confirmed that the new materials introduced in the proposed changes would not react with existing materials. These new materials have been previously approved without incident in radioactive material packages for transport of similar payload materials and no changes have been made in this revision that would impact the safe use of the packages.

7.2 Evaluations Findings

Based on a review of the statements and representations in the application, the staff concludes that the materials used in the Model Nos. TRUPACT-II and HalfPACT package design have been adequately described and evaluated and that the package meets the requirements of 10 CFR Part 71. The applicant described the changes to the application in sufficient detail and the staff confirmed that the requested changes would not invalidate any prior findings on the package's ability to meet the requirements of 10 CFR Part 71.

11. CONDITIONS

The staff made some editorial changes as well as changes to the conditions of approval to the CoCs for the Model Nos. TRUPACT-II and HalfPACT packages. The following items summarize the changes to both certificates.

11.1 General changes

The following general changes apply to the Model Nos. TRUPACT-II and HalfPACT CoCs:

- a) Increased the CoCs Revision No. (Condition 1.a.) by one.
- b) Condition No. 3.b., "Title and Identification of Report or Application," includes the date of the application.

11.2 Condition No. 5.(a)(3), "Drawings"

The Model Nos. TRUPACT-II and HalfPACT CoCs include the latest revisions for the following drawings:

- a) Drawing No. 2077-500SNP, "TRUPACT-II Packaging SAR Drawing," Revision BB, sheets 1-11
- b) Drawing No. 707-SAR, "HalfPACT Packaging SAR Drawing," Revision 12, sheets 1-12

11.3 References

The "REFERENCES" section of the Model Nos. TRUPACT-II and HalfPACT CoCs were revised to include the most recent consolidated application dated October 10, 2022 (NWP, 2022b).

CONCLUSION

Based on the statements and representations contained in the application, as supplemented, and the conditions listed above, the staff concludes that the designs have been adequately described and evaluated, and the Model Nos. TRUPACT-II and HalfPACT packages meet the requirements of 10 CFR Part 71.

Issued with Certificates of Compliance No. TRUPACT-II and HalfPACT packages, Revisions 27 and 11, respectively, on November 21, 2022.

REFERENCES

- (NRC, 1996) U.S. Nuclear Regulatory Commission, NUREG-6407, "Classification of Transportation Packaging and Dry Spent Fuel Storage System Components According to Importance to Safety," February 1996, Agencywide Documents Access and Management System (ADAMS) Accession No. ML15127A114.
- (NRC, 2020) U.S. Nuclear Regulatory Commission, NUREG-2216, "Standard Review Plan for Transportation Packages for Spent Fuel and Radioactive Material," August 2020, ML20234A651.
- (NWP, 2022a) Sellmer, T. E. Sellmer (NWP) letter to Document Control Desk (NRC), August 18, 2022, ML22230C920.
- (NWP, 2022b) Sellmer, T. E. Sellmer (NWP) letter to Document Control Desk (NRC), October 10, 2022, ML22283A029.