



U.S. DEPARTMENT *of* ENERGY

Office of Environmental Management

DOE Packaging Certification Program

SAFETY EVALUATION REPORT Letter Amendment of Certificate of Compliance No. 9979, for the Model 9979 Package

Docket No. 26-51-9979

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This Safety Evaluation Report (SER) documents the U.S. Department of Energy (DOE) Packaging Certification Program (PCP) independent review of the application prepared by the Savannah River National Laboratory (SRNL) on behalf of the DOE Savannah River Operations Office (SR) for a “letter” amendment of DOE Certificate of Compliance (CoC) Number 9979, to authorize use of the package for limited shipments with out-of-spec pressure relief devices installed in the 30-gallon drum lids.

Evaluation

By email ^[1] dated August 26, 2026, SR requested a letter amendment to the DOE CoC 9979, Rev.21, to authorize use of out-of-spec pressure relief devices (PRD) in 30-gallon drum lids. According to SRNL supporting justification (memorandum application) ^[2], fabrication changes by the legacy supplier of the PRD, Reike style bung plug, S220-2 VICEGRIP II®, used in Model 9979 have resulted in approximately 95% of the plugs failing to meet the minimum specified relieving pressure of 12-psig. DOE PCP staff’s initial review was by comparison to the approved safety basis documentation for CoC Rev 21, that is, the Safety Analysis Report for Packaging (SARP), Rev. 7, as supplemented. ^[3] During the review, CoC Rev. 22 was issued, on October 1, 2026, based on SARP Rev. 8. ^[4] Staff confirmed there were no changes in SARP Rev. 8 that would affect the initial evaluation. This evaluation is therefore based on CoC Rev 22 and SARP Rev. 8.

The PRD is a Quality Category B packaging component (i.e., major impact on safety) in accordance with SARP Table 9.3 and is identified as Item 8 on CoC Drawing R-R1-G-00028. The PRD technical requirements are specified in M-DS-G-00150. Note 9 of Drawing R-R1-G-00028 requires 100-percent testing of the PRDs to verify compliance with the specified internal relieving-pressure range of 12 psig to 21.7 psig. The PRDs in question failed to meet the minimum internal relieving pressure of 12 psig but instead were tested and verified to relieve at 10 psig. The minimum relieving pressure of the PRD is established such that the PRD remains closed under the evaluated NCT ground-transport pressure condition, consistent with the SARP design basis and the prohibition in § 71.43(h) against incorporating a feature intended to allow continuous venting during transport.

The SR request was supported by a memorandum application prepared by SRNL to justify the lower minimum pressure for one-time shipment of packages for disposal, from Y-12 (TN) to Nevada National Security Site (NV) or Waste Control Specialists (TX).

SRNL calculated a maximum differential pressure of 9.96 psig using the SARP maximum normal operating pressure (MNOP) of 21.16 psia and an external pressure of 11.2 psia corresponding to the maximum route elevation identified in the application.

DOE PCP staff independently evaluated the proposed change and established a maximum authorized transport elevation of 7,335 ft. as a condition of approval. At 7,335 ft., the corresponding atmospheric pressure used in the staff evaluation is approximately 11.17–11.20 psia. Combining this external pressure with the full SARP MNOP of 21.16 psia results in a maximum calculated differential pressure of approximately 9.96–9.99 psig, which is below the proposed minimum PRD relieving pressure of 10 psig.

Although the nominal difference between the calculated bounding differential pressure and minimum PRD relieving pressure is small, DOE PCP staff confirmed that the 21.16-psia MNOP is conservatively established relative to the contents authorized by this amendment. SARP Section 3.1.2, *Content's Decay Heat*, identifies a maximum calculated decay heat of 0.163 W for Table 1.2

contents and states that the thermal analysis for Table 1.2 conservatively assumes a 3.5-W heat load. Thus, the heat load used in the bounding thermal analysis is approximately 21.5 times the maximum calculated decay heat of the contents evaluated for this amendment. SARP Section 3.1.4 states that the NCT pressure calculation assumes loading at sea level with 2 lb. of free water. SARP Section 3.3.2 and Table 3.13 identify the calculated NCT pressure contributions as 17.03 psia from temperature increase and 4.13 psia from moisture evaporation, resulting in an MNOP of 21.16 psia. Staff did not take numerical credit for these conservatisms in calculating the amendment-specific pressure differential; the full SARP MNOP of 21.16 psia was retained. Staff therefore finds that application of the full 21.16-psia MNOP at the maximum authorized transport elevation provides a conservative bounding evaluation for the Table 1.2 shipments authorized by this amendment.

Staff also confirmed that the change does not adversely affect package structural performance. SARP Section 2.6.3, *Reduced External Pressure*, evaluates the package at the 3.5-psia reduced external pressure per § 71.71(c)(3). Combining the 21.16-psia MNOP with the 3.5-psia external pressure produces a maximum differential pressure of 17.66 psig. Section 2.6.3 concludes that the resulting pressures are within the capacity of both the 55-gallon overpack and 30-gallon drum. SARP Section 4.2, *Containment Under Normal Conditions of Transport*, further identifies approximately 17.6 psig as the maximum NCT differential pressure and compares it with the 30-gallon drum's 21.7-psig pressure rating. Therefore, the existing structural evaluation bounds the proposed 10-psig PRD condition and the maximum differential pressure associated with the restricted transportation conditions.

Staff also considered the NCT cold condition. SARP Table 2.9 identifies -40°F as the minimum 30-gallon drum temperature, and SARP Section 2.6.2 states that cold-condition stresses are bounded by the temperature and pressure extremes evaluated in M-CLC-G-00376 (SARP Section 2.14, Ref 10). Because the NCT hot condition produces the maximum internal pressure relevant to outward PRD actuation, the cold condition does not control the minimum PRD relieving-pressure evaluation.

Therefore, subject to CoC conditions limiting the authorization to SARP Table 1.2 contents, the specified one-way shipments from Y-12 to NNSS or WCS, and transport routes not exceeding 7,335 ft. above mean sea level, DOE PCP staff finds reasonable assurance that use of PRDs authorized by this letter amendment having a relieving pressure of not less than 10 psig and not greater than 21.7 psig will maintain the applicable safety functions of the 9979 package and comply with the applicable requirements of 10 CFR Part 71. Staff recommends approval and issuance of the letter amendment by the DOE HCO.

Conditions of Approval

The following conditions are required to implement in a letter amendment to DOE CoC 9979, Rev. 22.

1. Each PRD (Item 8, CoC drawing R-R1-G-00028) authorized by this letter amendment must be tested prior to use and demonstrate a relieving pressure not less than 10 psig and not greater than 21.7 psig.
2. Contents are limited to those authorized by CoC Table 2, including a maximum calculated decay heat of 0.163 W.
3. The transport routes must not exceed 7,335 ft. above mean sea level.
4. All other conditions of DOE CoC No. 9979 shall remain the same.
5. This authorization expires on October 30, 2027, or upon completion of the one-way shipments authorized by this letter amendment, whichever occurs first.

Conclusion

Based on the statements and representations in the application, DOE PCP staff's independent evaluation, and compliance with the Conditions of Approval specified herein, staff concludes that the Model 9979 package, as authorized by this letter amendment, has been adequately evaluated and provides reasonable assurance of compliance with the applicable requirements of 10 CFR Part 71.

References

- [1] *SRNL Letter Amendment Request for 9979*, Email, Sobus to Gelder, August 26, 2026.
- [2] *Request for Letter Amendment: One-Time Change to Pressure Relief Requirement for 9979 PRDs*, SRNL-2230000-2026-00033, Rev. 0, August 26, 2026.
- [3] *Safety Analysis Report for Packaging Model 9979 Type AF-96*, S-SARP-G-00006, Revision 7, December 2020, as supplemented in DOE CoC Rev 21.
- [4] *Safety Analysis Report for Packaging Model 9979 Type AF-96*, S-SARP-G-00006, Revision 8, April 2026.