

Research and Special Programs Administration

49 CFR Part 178

[Docket No. HM-190; Notice No. 84-7]

Modifications to DOT Specification 21PF-1 Overpacks

AGENCY: Materials Transportation bureau (MTB), Research and Special Programs Administration, DOT.

ACTION: Notice of proposed rulemaking.

SUMMARY: MTB proposes to modify the design of the 21PF-1 overpack to alleviate problems which have resulted from water in-leakage, retention and subsequent out-leakage. This proposal is based on a petition from the Department of Energy (DOE) and would entail modifications to existing overpacks as well as design modifications for future construction of overpacks.

DATE: Comments must be received by September 14, 1984.

ADDRESS: Dockets Branch, Materials Transportation Bureau, Research and Special Program Administration, U.S. Department of Transportation, Washington, D.C. 20590. Comments should identify the docket and be submitted, if possible, in five copies. Persons wishing to receive confirmation of receipt of their comments should include a self-addressed stamped post card. The Dockets Branch is located in Room 8426 of the Nassif Bldg., 400 Seventh Street, S.W., Washington, D.C. 20590. Public dockets may be reviewed between the hours of 8:30 a.m. and 5:00 p.m., Monday through Friday, except public holidays.

FOR FURTHER INFORMATION CONTACT: Richard R. Rawl, Office of Hazardous Materials Regulation, Materials Transportation Bureau, U.S. Department of Transportation, Washington, D.C. 20590, (202) 426-2313.

SUPPLEMENTARY INFORMATION: Extensive experience has been gained by the Department of Energy (DOE) in shipping 21PF-1 overpacks in relation to its uranium enrichment service. The 21PF-1 design, as found in 49 CFR 178.121, has not been significantly changed since its original publication in 1974 (39 FR 45250). As a result of its extensive experience, the DOE has petitioned for a number of modifications

to the design to alleviate problems which have been repeatedly encountered in the shipment and reuse of these overpacks.

I. Existing 21PF-1 Overpacks

The primary difficulty encountered with the existing 21PF-1 design is that hardware fabricated in accordance with the design has a tendency to collect and retain water during normal use. This water accelerates the corrosion of metal parts and the decay of wooden parts. Additionally, the water often collects during rainy weather and leaks or sloshes out during dry weather. Such liquid leakage from a package marked and labeled "radioactive" causes considerable alarm even though the water is in no way contaminated with radioactive material. In order to alleviate these problems the DOE has suggested several changes.

The first set of proposed changes involve existing overpacks which have been constructed to the existing 21PF-1 design. The proposed changes are designed to remove (by drying) water which may be retained in the overpack, to drill drain holes in the stiffener angle* (which are external to the overpack) that tend to collect water, and to seal those joints which easily admit water. The sealing involves installation of a new joint cover and gasket, and application of a sealant compound to the stiffener/outer shell joint.

The details of the proposed modifications to the existing overpacks are contained in a number of reports and drawings submitted by DOE in support of its petition. These documents are available for viewing in the Public Docket Room, at the address shown above. The following is a list and brief description of the proposed changes:

Design Changes for Existing Overpacks

1. Reference is made to Drawing No. S1E-31536-J1-O.
2. General Note No. 1 on the drawing describes the water removal procedure which must be completed prior to initiating any modifications. The drying procedure entails subjecting the overpack to a controlled temperature environment of 190°F minimum to 210°F maximum until there is less than a 10 pound weight loss in a six hour period. The overpack must be in an inverted position to permit the water to drain out. By controlling the temperature in the water removal procedure to less than 210°F, the phenolic foam insulation is essentially unaffected. This is supported by:

a. UCC-ND Internal Correspondence dated Dec. 8, 1982, from N.C. Owens to

W. R. Colliher, "Overpack Moisture Removal Tests."

b. UCC-ND Internal Correspondence dated Feb. 7, 1983, from D.C. Canada to J. G. Rogers, "Drying of UF₆ Cylinder Overpack Insulation."

c. UCC-ND Report K/TL/SS-88, J. L. Frazier, "UF₆ Product Cylinder-Overpack Insulation", February, 1983.

3. Drill drain holes in stiffener angles. These stiffener angles are exterior to the overpack. Water collects in these stiffener angles, but cannot readily drain; however, it can slosh out. The drain holes do not affect the integrity of the overpack.

4. Install stainless steel joint cover. The joint cover is 14-gage stainless steel. This is installed on the joint for the lower half of the overpack which is where the water accumulation problem has been significant. While overpacks such as the "Paducah Tiger", Certificate of Compliance 6553, have metal joint covers, a heat transfer analysis was made to assure safe internal exposures during the thermal exposure. The analysis did not reveal any significant temperature increase due to joint cover. See Attachment D of UCC-ND Report K/D-5400, Rev. 1.

5. Seal joints between stiffeners and outer shell. The stiffeners are tack-welded to the outer shell. Moisture accumulates underneath the stiffeners and accelerates corrosion. The sealing will minimize the corrosion in these areas.

6. Install Gaskets. The proposed gaskets are a one-piece molded Silastic RTV rubber. This is a more permanent type of gasket than the currently specified foam plastic gasket. The shape and one-piece design will provide an improved seal. The gasket is also reusable.

7. Remove rust spots and seal any holes; paint these areas with suitable primer and finish coats of paints that are compatible with and match existing paint. This will help minimize future in-leakage problems.

8. Weigh modified container and stamp weight and date on or near nameplate, etc. This weight should be the actual tare weight of the overpack. This weight will provide a benchmark for future inspections to determine if moisture has accumulated in the phenolic foam insulation.

9. Mark overpack to indicate performance of modifications. The costs of these modifications are expected to be largely, if not entirely, offset by the extended lives of the modified overpacks.

II. Future Construction of 21PF-1 Overpacks

The second part of the DOE petition involves modifications to the design of the 21PF-1 for any future construction. These design changes are more comprehensive than those proposed for existing overpacks. It is possible to perform new construction to a more highly modified design than to extensively modify existing hardware.

The most significant proposed design changes involve constructing the metal shell with Type 304 or 304L stainless steel as opposed to mold steel and reversing the step-joint at the overpack closure. The step-joint would be switched from a step-down to a step-up going from the outside to the inside. These changes will decrease the in-leakage problem and greatly prolong the life expectancy of the overpacks. The details of each proposed change are found in a number of reports and drawings submitted by DOE in support of the petition. These are available for viewing in the Public Docket Room.

The full list of design changes is as proposed in UCC-ND Report K/D-5400, Rev. 1, dated March 30, 1983, "Safety Analysis Report for Modified UF₆ Cylinder Shipping Package, DOT Specification 21PF-1" and is as follows:

1. Wood materials would be changed from hard or sugar maple to white oak. Either wood is suitable, but white oak is more readily available.

2. All metal parts would be changed from carbon steel to stainless steel, type 304 or 304 L.

3. The need for painting the metal would be eliminated.

4. The vent holes needed to prevent overpack rupture by allowing the insulation foam decomposition gases to escape in event of fire would be plugged with stainless steel pop rivets and RTV silicone sealer in place of using Metal Set 4A Epoxy.

5. The step joint surface between the top and bottom halves would be changed from a step-down toward the inside to a step-up to the inside in order to reduce water in-leakage.

6. The wood step joint which was formerly painted would be covered with stainless steel.

7. The step joint gasket would be changed from 3M Scotch foam, closed cell vinyl black No. Y9132C or expanded rubber per ASTM D 1056, Type R or S, Grade 41, 42, or 43, 1/4" thick x 3/4" wide with adhesive backing to a one piece molded Silastic E RTV rubber, 35-45 Durometer with Silastic 732 RTV adhesive.

8. Drain holes would be added to the angle stiffeners along the bottom of the lower half.

9. Silastic 732 RTV Adhesive/Sealant would be added between the intermittent welds at all stiffeners, angles, plates, etc.

10. The tare weight and fabrication date for the overpack would be stamped (instead of marked) on or near the name plate.

These changes would be incorporated into the construction specifications for the 21PF-1 as found in 49 CFR Part 178. After a "grace" period of 6 months each newly constructed overpack would be required to meet the new specification.

III. Modifications to CAPE-1662

The CAPE-1662 package of drawings is incorporated by reference (49 CFR 171.7(d)(16)) for use in the construction of the 20PF and 21PF series of overpacks. As a result of the changes proposed, the CAPE-1662 drawings would be modified by adding the following drawings:

E-S-31536-J, Revision L and E-S-31536-J2, Revision 0 which describe the new 21PF-1 design; and
S/E-31536-J1, Revision 0 which describes the modifications necessary to existing 21PF-1 overpacks.

IV. Compliance Dates

Existing overpacks will need to be withdrawn from service and modified. In order to allow this to proceed in an orderly manner it is proposed that a period of 18 months be allowed for the continued use of unmodified overpacks. After 18 months the use of unmodified overpacks would be prohibited.

Similarly, there may be new overpacks on order or under construction. A cutoff date of 6 months after the publication of the final rule is proposed for new construction to the old design. These overpacks would, however, have to be modified in the same way as existing ones.

MTB has determined that this proposed regulation will not result in a "major rule" under the terms of Executive Order 12291 or a significant regulation under DOT's regulatory policy and procedures (44 FR 11034), nor require an environmental impact statement under the National Environmental Policy Act (49 U.S.C. 4321 et. seq.).

Based on limited information available concerning size and nature of entities likely to be affected by this proposal, I certify that this proposal will not, if promulgated, have a significant economic impact on a substantial number of small entities because the overall economic impact of this proposal will be minimal. A regulatory evaluation is available for review in the docket.

List of Subjects in 49 CFR Part 178

Hazardous materials transportation, Packaging and containers.

In consideration of the foregoing, Part 178 of 49 CFR would be amended as follows:

PART 178—SHIPPING CONTAINER SPECIFICATIONS

§ 178.121-2 [Amended]

1. In § 178.121-2, paragraphs (b) and (g) would be amended by removing the period after "equivalent" and adding "or as specified in CAPE-1662."

2. Section 178.121-5 would be added to read as follows:

§ 178.121-5 Construction of new 21PF-1 overpacks.

Each 21PF-1 overpack constructed after April 1, 1985 must conform with drawings E-S-31536-J, Revision L and E-S-31536-J2, Revision 0 of the CAPE-1662.

3. Section 178.121-6 would be added to read as follows:

§ 178.121-6 Modification of certain 21PF-1 overpacks.

(a) Each specification 21PF-1 overpack constructed in accordance with drawing E-S-31536-J, Revision 11 of CAPE-1662 must be modified in accordance with drawing S/E-31536-J1, Revision 0 of CAPE-1662 no later than October 1, 1986.

(b) Each specification 21PF-1 overpack that is modified in accordance with paragraph (a) of this section must also be:

(1) Marked in the immediate vicinity of the marking required by § 178.121-3(b)(1), the word "MODIFIED";

(2) Stamped on or near the nameplate "TARE WT:XXX lbs (or kg)" where XXX is the tare weight of the assembled, modified overpack without the inner container. The previous tare weight marking must be changed to reflect the modified tare weight value or must be covered or obliterated;

(3) Stamped with the month and year of modification in a manner clearly distinguishable from the year of manufacture marking required by § 178.121-3(b)(3); and

(4) Marked with the name or symbol of the person making the marks specified in this section.

(49 U.S.C. 1803, 1804, 1808, 49 CFR 1.53; 49 CFR App. A to Part 1, and paragraph (a)(2) of Appendix A to part 106)

Issued in Washington, D.C. on August 10, 1984.

Joseph T. Horning,
Acting Associate Director for Hazardous
Materials Regulation, Materials
Transportation Bureau.