



U.S. Department  
of Transportation  
**Pipeline and  
Hazardous Materials  
Safety Administration**

East Building, PHH-23  
1200 New Jersey Ave., SE  
Washington, D.C. 20590

**JUN 20 2007**

Attention: Registered Users of USA/4909/AF

Enclosed is the latest revision of U.S. Certificate of Competent Authority No. USA/4909/AF for the DOT Specification 21PF-1A and 21PF-1B overpacks. This revision adds additional special transport conditions and revises the inspection requirements as follows:

- Overpacks shall be stored under roof or under protective covering when not in use
- Overpacks which have been dried more than once in their entire service life shall be removed from service
- No additional drying of the overpacks or repair of the foam is permitted
- In addition to the prior restrictions on weight gain, weight loss of more than 1% in either half of the overpack shall result in removal from service
- Repairs to the overpack shells require authorization from the Competent Authority (replacement/repair of lifting shackles, closure bolts, tie-down supports, gaskets, and cavity pads are permitted).

These actions are being taken in response to information provided to this office regarding degradation of the phenolic foam observed in units taken out of service that had been stored outdoors and subject to precipitation conditions.

While we have included a 90-day transition period for use of the previous revision to allow for adoption by other competent authorities, to provide assurance for continued safe usage of these packages, we encourage immediate adoption of the new inspection and transport conditions. As before, our certification of these packages expires on September 1, 2009.

If you have any questions on this certificate, please contact me by phone at 202-366-2993 or by e-mail at [Rick.Boyle@dot.gov](mailto:Rick.Boyle@dot.gov).

Sincerely,

Richard W. Boyle, Chief  
Radioactive Materials Branch  
Office of Hazardous Materials  
Technology

Enclosure



U.S. Department  
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East Building, PHH-23  
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**COMPETENT AUTHORITY CERTIFICATION  
FOR A TYPE AF FISSILE  
RADIOACTIVE MATERIALS PACKAGE DESIGN  
CERTIFICATE USA/4909/AF, REVISION 18**

This certifies that the radioactive materials package design described below has been certified by the Competent Authority of the United States as meeting the regulatory requirements for a Type AF packaging for fissile radioactive materials as prescribed in the regulations of the International Atomic Energy Agency<sup>1</sup> and the United States of America<sup>2</sup>.

1. Package Identification - DOT Specification 21PF-1A and 21PF-1B overpacks. DOT Specification 21PF-1B overpacks manufactured by Nuclear Containers, Inc. of Elizabethton, Tennessee prior to November 30, 1991 are not authorized by this certificate.
2. Package Description - The packagings authorized by this certificate consist of overpacks and valve protection devices (VPD) for 76 cm (30 inch) diameter cylinders containing enriched uranium hexafluoride. The overpack is a right circular cylinder constructed of two steel shells. The volume between the shells is filled with wood blocks and fire resistant phenolic foam. The VPD, United States Enrichment Corporation Model no. USEC-VPD-1996, consists of 3 aluminum inserts, 1 spacer and 1 spider. Maximum gross weight of the package is 4000 Kg (8,800 pounds).

All packages authorized by this certificate must meet the applicable requirements of 49 CFR 173.24, 173.410, 173.412, and 178.358. DOT Specification 21PF-1B overpacks may have any or all of the variations listed in Appendix A.

All packages authorized by this certificate must be inspected in accordance with the provisions of Appendix B prior to each use. The inspection must be completed within six months of overpack use.

3. Authorized Radioactive Contents -
  - a. All cylinders containing uranium hexafluoride used in accordance with this certificate must meet the applicable requirements of 49 CFR 173.420. However, in variance to the American National Standards Institute (ANSI) N14.1 standard referenced, the valve stem and plug of the 30 inch diameter cylinder may be tinned with ASTM B32, alloy 50A or Sn50 solder material, or a mixture of alloy 50A or Sn50 with alloy 40A or Sn40A material, provided the mixture has a minimum tin content of 45 percent.
  - b. The packages are authorized to contain uranium hexafluoride in quantities up to those identified in Table 1. The criticality safety index assigned to each package must also be in accordance with Table 1. The criticality analysis conducted on these packages did not consider the presence of water in the inner cylinder containing the uranium hexafluoride. The maximum number of packages per conveyance is determined in accordance with Table X of the IAEA regulations cited in this certificate.

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<sup>1</sup> "Regulations for the Safe Transport of Radioactive Materials, 1996 Edition (Revised)", No. TS-R-1 (ST-1, Revised)," published by the International Atomic Energy Agency (IAEA), Vienna, Austria.

<sup>2</sup> Title 49, Code of Federal Regulations, Parts 100 - 199, United States of America.

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TABLE 1 - AUTHORIZED QUANTITIES AND MINIMUM CRITICALITY SAFETY INDEX FOR THE TRANSPORT OF URANIUM HEXAFLUORIDE (UF<sub>6</sub>)

Overpack and Cylinder Specification	Max. Inner Cylinder Dia.		Max. Weight of UF <sub>6</sub> Contents		Max. U-235 Enrichment (Wt %)	Minimum Crit. Safety Index
	cm	inch	Kg	Lbs		
21PF-1A/B with a 30A cylinder	76	30	2,247	4,950	5.0	5.0
21PF-1A/B with a 30B cylinder	76	30	2,282	5,020	5.0	5.0

Note: the maximum permitted H/U atomic ratio is 0.088 for all 76 cm (30 inch) diameter cylinders (Reference: USEC-651).

4. General Conditions -

- a. Each user of this certificate must have in his possession a copy of this certificate and all documents necessary to properly prepare the package for transportation.
- b. Each user of this certificate, other than the original petitioner, shall register his identity in writing to the Radioactive Materials Branch (PHH-23), Office of Hazardous Materials Technology, Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, Washington, D.C. 20590-0001.
- c. This certificate does not relieve any consignor or carrier from compliance with any requirement of the Government of any country through or into which the package is to be transported.
- d. This package has not been evaluated against the air transport requirements of the 1996 edition (revised) of the International Atomic Energy Agency's Regulations for Safe Transport of Radioactive Materials, TS-R-1 (ST-1, Revised). Therefore, air transport of this package in accordance with those regulations is not authorized.

5. Special Transport Conditions -

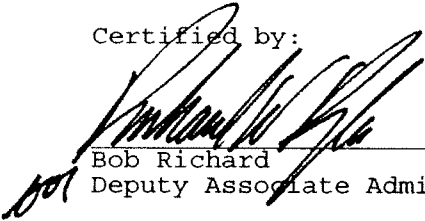
- a. Packages shall be handled and operated in accordance with the procedures and packaging criteria identified in the American National Standards Institute (ANSI) Standard N14.1-2001 and United States Enrichment Corporation Report No. USEC-651.
- b. All packages transported under this certificate shall utilize USEC valve protection device model no. USEC-VPD-1996. This valve protection device was specified by USEC in their certificate application and shall be constructed of ASTM B26 Aluminum Alloy 514. Valve protection device shall be operated and maintained in accordance with the procedures detailed in section 13.2 and 13.3.1 of United States Enrichment Corporation Report No. USEC-651.

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- c. All packages transported under this certificate shall be stored indoors or under protective covering when not in transport to prevent exposure to precipitation.
- d. All packages transported under this certificate must meet the inspection requirements of Appendix B.
- 6. Marking and Labeling - The package shall bear the marking USA/4909/AF in addition to other required markings and labeling.
- 7. Expiration Date - This certificate expires on September 1, 2009. On October 1, 2007, this certificate supersedes all previous revisions of USA/4909/AF.

This certificate is issued in accordance with paragraph 814 of the IAEA Regulations and Sections 173.471 and 173.472 of Title 49 of the Code of Federal Regulations, in response to the May 3, 2007 petition by Transport Logistics International, Burtonsville, MD and in consideration of other information on file in this Office.

Certified by:



Bob Richard  
Deputy Associate Administrator for Hazardous Materials Safety

JUN 20 2007

(DATE)

Revision 18 - Issued to implement additional special transport conditions and revised inspection requirements with no further drying permitted.

#### Appendix A: Variations From 49 CFR 178.358

The following variations from the design specification for the DOT Specification 21PF-1B overpack found in 49 CFR 178.358 are authorized:

- (1) The Schenectady Chemical Company HRJ-11825 phenolic resin is authorized in place of the Union Carbide BRL-2760 phenolic resin that was specified for the SP-9 phenolic foam of the overpack.
- (2) 0.75" stainless steel shackles with a weight limitation of 4,475 pounds and with a safety factor of five.
- (3) Continuous welding of bottom forklift angles rather than intermittent welds.
- (4) Continuous welding on reinforcement angles rather than intermittent welds.
- (5) Attachment of nameplates via the use of pop rivets. The nameplates must be sealed with RTV caulking.
- (6) Either red or white oak for the wooden inner structure is authorized provided the moisture content of the oak is 15% or less.
- (7) The weight of the foam in each half is not to be less than a 100 pounds nor more than 150 pounds.
- (8) The use of a 0.625" thick gasket rather than 0.5" thick gasket.
- (9) Lug material for the closure bolts may be 2.25" x 2.25" which must be cut from 2.5" x 2.5" material rather than 2.0" x 2.0" material.
- (10) The requirement on drawing E-S-31536-J, Rev. P to stencil the tare weight on each half of the overpack is waived since the tare weight is marked on the nameplates.
- (11) Stenciling the serial number on the end(s) of the overpack is permitted.
- (12) Painting of the foam side of both the inner and outer shell with an epoxy primer or equivalent coating which eliminates foam contact with the stainless steel shell. Painting of the outside surfaces of the overpack is authorized provided the markings on the overpacks are clearly legible on a contrasting background.
- (13) Corner wood rail joints - full lap of the side rails onto the end blocks with vertical dowel rods.
- (14) Rail caps may be constructed by the use of cap board laminated to a solid side rail base. Also, support blocks may be laminated.
- (15) The requirement in the specification for the support block chamfer to be 1.0" x 1.0" x 45° is waived.
- (16) The requirement in the specification for the foam retention wood ring on the end block is waived.
- (17) The end corner reinforcement may be a 3.0" x 0.25" flat bar on the side and a 2.0" x 0.25" flat bar on the end.
- (18) The outside shell may be fabricated using either one or two sheets of stainless steel.
- (19) Inside reinforcement angles with dimensions of 2" x 2" x 0.25" may be used instead of 2.0" x 2.0" x 0.188" reinforcement angles.
- (20) The requirement in the specification to place wet rags around welding points over wood or foam is waived.
- (21) Owens Corning fiberglass roving component No. 405D-14C 4 mm may be substituted for Owens Corning fiberglass roving component No. 405 1/4".

## Appendix B: Mandatory Inspection Requirements

Each DOT-21PF-1 overpack shall be inspected prior to each use, with the inspection occurring no more than 6 months prior to the overpack use. This inspection must include at least the following:

- (1) Visual inspection to ensure lifting shackles, closure bolts, and tie-down supports are free from damage.
- (2) Visual inspection of entire interior and exterior of the overpack to determine:
  - a. The presence of any through wall corrosion. Through wall corrosion is cause for removal of the overpack from service.
  - b. Amount of reduction of shell thickness by corrosion or oxidation. If a visual inspection cannot confirm thickness of shell, other non-destructive evaluation techniques shall be used. Reduction of 10% or more from the original nominal wall thickness is cause for removal of the overpack from service. Any repairs needed on the shell to restore thickness shall require authorization by the Competent Authority.
  - c. Amount of deformation and denting of the shell. Any shell deformation or dent greater than 1.27 cm (0.50 inch) in depth is cause for removal of the overpack from service. Any repairs needed on the shell to remedy deformation or denting shall require authorization by the Competent Authority.
  - d. All welding repairs shall be made by welders qualified in accordance with Section IX of the ANSI/ASME Boiler and Pressure Vessel Code or Section 5 of the ANSI/AWS D1.1 code. Certification of weld procedures and welder qualifications shall be maintained and provided to the Competent Authority or his designee upon request.
- (3) Foam shall be inspected to ensure the rigidity and presence of foam. Each vent hole shall be inspected with a probe to detect voids in the foam. New vent caps shall be installed and properly sealed after completion of foam inspection. A void in the foam greater than 1.27 cm (0.5 inch) in depth or diameter is cause for removal of the overpack from service.
- (4) Gaskets and cavity pads shall be in place and free from damage or deterioration.
- (5) Visual inspection shall ensure proper lid to body fit.
- (6) All closure bolts shall be free of corrosion. Check proper operation of all closure bolts with a torque of 50 foot pounds (tolerance of +/- 5 foot lbs) .
- (7) Determine the weight of each half (lid and body) to ensure neither is more than 11 kg greater than the weight on the nameplate. If either half exhibits a gain of 11 kg or more or if the overpack as a whole exhibits a weight gain of 20 kg or more, the overpack shall be removed from service. Further drying of the overpack is not permitted. Any overpack that has previously been dried more than once in its entire service life shall be removed from service.
- (8) Determine the weight of each half (lid and body) to ensure neither is less than 99% of the weight on the nameplate. If either half exhibits a weight loss of more than 1%, the overpack shall be removed from service.
- (9) The exterior nameplate of the overpack shall list the date of the last inspection and the company that performed the inspection.
- (10) Records of this inspection shall be maintained and provided to the Competent Authority or his designee upon request.



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**CERTIFICATE NUMBER:** USA/4909/AF-85, Revision 18

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