

U.S. NUCLEAR REGULATORY COMMISSION
CERTIFICATE OF COMPLIANCE
For Radioactive Materials Packages

1.(a) Certificate Number 6400	1.(b) Revision No. 7	1.(c) Package Identification No. USA/6400/B()F	1.(d) Pages No. 7	1.(e) Total No. Pages 6
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2. PREAMBLE

- 2.(a) This certificate is issued to satisfy Sections 173.393a, 173.394, 173.395, and 173.396 of the Department of Transportation Hazardous Materials Regulations (49 CFR 170-189 and 14 CFR 103) and Sections 146-19-10a and 146-19-100 of the Department of Transportation Dangerous Cargoes Regulations (46 CFR 146-149), as amended.
- 2.(b) The packaging and contents described in item 5 below, meets the safety standards set forth in Subpart C of Title 10, Code of Federal Regulations, Part 71, "Packaging of Radioactive Materials for Transport and Transportation of Radioactive Material Under Certain Conditions."
- 2.(c) This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. This certificate is issued on the basis of a safety analysis report of the package design or application—

3.(a) Prepared by (Name and address): Westinghouse Electric Corporation P. O. Box 355 Pittsburgh, Pennsylvania 15230	3.(b) Title and identification of report or application: Westinghouse Electric Corporation application dated July 13, 1973, as supplemented.
3.(c) Docket No. 71-6400	

4. CONDITIONS

This certificate is conditional upon the fulfilling of the requirements of Subpart D of 10 CFR 71, as applicable, and the conditions specified in item 5 below.

5. Description of Packaging and Authorized Contents, Model Number, Fissile Class, Other Conditions, and References:

(a) Packaging

- (1) Model No.: Super Tiger
- (2) Description

A protective overpack which provides containment, impact resistance and thermal resistance for its contents. The containment vessel (cavity) is approximately 76" x 76" x 172" constructed of 3/16" thick and 10-gage mild steel. Closure of the containment vessel is by a 1/4" thick aluminum plate with silicone rubber gasket which is bolted to the containment vessel. A pressure fitting with cap on the closure plate provides a means for leak testing. The containment vessel is centered and supported in an outer 3/16" thick steel jacket by approximately 32" of polyurethane foam insulation at the end and 10" on the sides. A removable section or cap consisting of approximately 34" of polyurethane foam insulation encased in steel with a silicone rubber gasket is bolted to the main outer steel jacket. The overall dimensions of the packages are approximately 8' x 8' x 20'. Vent holes are provided on the sides and ends of the container. Set into each corner of the outer container are standard I.S.C. steel castings. The total weight including weight of the contents is 45,000 pounds.

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5. (a) Packaging (continued)

(3) Drawings

Packaging is constructed in accordance with Protective Packaging, Inc., Drawings Nos.: 32106-1, Sheet 1, Revision F; and 32106, Sheet 2.

(b) Contents

(1) Type and form of material

- (i) Radioactive material including fissile material as solids or liquids, in normal or special form packaged in secondary packaging which meets the requirements for Type A (49 CFR §173.389(j)) packaging.
- (ii) Radioactive material including fissile material as solids, in normal or special form packaged in secondary packaging which meets DOT Specification 17C or 17H 55-gallon steel drums. Fissile material concentration shall be no more than 5 grams fissile material in any liter.
- (iii) Radioactive material including fissile material as solids in normal or special form packaged in an inner containment vessel which conforms to DOT Specification 2R and with a maximum usable inside dimension of 5.25 inches. The inner containment vessel shall be centered and positioned within a 55-gallon capacity DOT Specification 6J, 17H, 6C or 17C steel drum by solid industrial cane fiberboard having a density of at least 0.249/cc or by at least 4 steel rod radial spacers at 90° separation with bagged or tamped vermiculite having a density of at least 0.072 g/cc.
- (iv) Plutonium-bearing solid wastes packaged as follows:

Soft waste (plastic sheeting, gloves, paper, prefilter media, polyethylene bottles, shoe covers, etc.)

Double-bagged in 12-mil thick PVC, with each bag heat-sealed (bag size not exceeding 22" x 16" x 10") and packaged within a DOT Specification 17H 55-gal steel drum with a sealed plastic bag liner and equipped with a standard drum closure.

Hard waste (equipment, metal cans, tools, etc.)

Sharp edged and pointed items shall be rounded off and blunted. All items shall be strip coated (by painting, dipping, spraying, etc.) to fix contamination prior to packaging. Glassware shall be crushed and sealed in metal containers. Each item shall be double-bagged within 12-mil thick PVC, with each bag heat-sealed and packaged to reduce secondary impacts within DOT Specification 17H 55-gal steel drum with a sealed plastic bag liner equipped with a standard drum closure.

5. (b) Contents (continued)

Solidified liquid waste

Liquid waste shall be solidified in concrete in 30-gal drum which is sealed in a plastic bag and centered and supported in a DOT Specification 17H 55-gal steel drum by vermiculite, absorbent or plastic material. The 55-gal drum shall be lined with a sealed plastic bag liner and equipped with a standard drum closure.

Soft, hard, or solidified liquid waste shall not be comingled within the same DOT Specification 17H 55-gal steel drum.

Large equipment waste (glove boxes, furnaces, blowers, duct-work, etc.)

Large equipment which will not fit into a 55-gal steel drum (see above contents) shall be enclosed in a tight fitting rectangular box constructed of 3/4" plywood. The equipment contaminated surfaces shall be strip coated (by painting, dipping, spraying, etc.) to fix contamination or otherwise sealed by pipe caps or gasketed blind flanges prior to packaging. The space between the equipment and the box shall be filled with foam or vermiculite. Smaller strip coated (as outlined above) equipment items (which will not fit into a 55-gal drum) may be placed inside the larger piece of equipment (e.g., glove box) provided the space between the smaller and larger equipment is also filled with foam or vermiculite. All sharp or protruding objects from equipment shall be removed or blunted to eliminate the possibility of these objects damaging the packaging during normal or accident conditions of transit. Boxes shall not be comingled with 55-gal drums.

(2) Maximum quantity of material per package

Plutonium in excess of twenty (20) curies per package except for Contents 5.(b)(1)(iv) above must be in the form of metal, metal alloy or reactor elements, and

(i) For the contents described in 5.(b)(1)(i):

Greater than Type A quantity of radioactive material in secondary packaging. Fissile material contents per package not to exceed the generally licensed mass limits as specified in 10 CFR §71.11.

(ii) For the contents described in 5.(b)(1)(ii):

Greater than Type A quantity of radioactive material in secondary packaging. Forty-two, DOT Specification 17C or 17H 55-gallon steel drums. Each drum is limited to a maximum of 200 grams fissile material with no more than 5 grams fissile material in any liter and a maximum of 200 pounds of graphite.

- (ii) For the contents described in 5.(b)(1)(iii):

Greater than Type A quantity of radioactive material in secondary packaging. Forty-two, 55-gallon capacity steel drums. Each inner containment vessel is limited to a maximum of 500 grams fissile material with an H/U ratio not to exceed 20.

- (iv) For the contents described in 5.(b)(1)(i):

Greater than Type A quantity of radioactive material in secondary packaging. Not more than 5 grams/cu ft fissile material.

- (v) For the contents described in 5.(b)(1)(iv):

Greater than Type A quantity of plutonium-bearing waste materials in secondary packaging. Each drum shipment shall consist of forty-two (42) DOT Specification 17H 55-gal steel drums equipped with a standard drum closure. Each drum or plywood box (as defined in 5.(b)(1)(iv)) is limited to 60 grams plutonium.

(c) Fissile Class

I, II and III

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|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| (1) Fissile Class I | For the contents described in 5.(b)(1)(ii), and 5.(b)(1)(iii) and limited in 5.(b)(2)(ii) and 5.(b)(2)(iii). |
| (2) Minimum transport index to be shown on label for Class II | For the contents described in 5.(b)(1)(i) and limited in 5.(b)(2)(i):

As prescribed by 10 CFR §71.11(b). |
| (3) Maximum number of packages per shipment for Class III | For the contents described in 5.(b)(1)(i) and 5.(b)(1)(iv) and limited in 5.(b)(2)(iv) and 5.(b)(2)(v): |

One (1)

6. The maximum weight of the contents including secondary packaging, dunnage, shoring and bracing must not exceed 30,000 pounds.
7. The maximum decay heat generation per package must not exceed:
- (i) 30 watts and the heat sources are distributed throughout the cavity such that the temperature at any point within the cavity does not exceed 200°F, or
 - (ii) 235 watts provided combustible solids or liquids are not present and the heat sources are distributed throughout the cavity such that the internal surface temperature of the cavity walls will nowhere exceed 350°F.

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8. The contents described in 5.(b)(1)(i), 5.(b)(1)(ii) and 5.(b)(1)(iii) and limited in 5.(b)(2)(i), 5.(b)(2)(ii) and 5.(b)(2)(iii) may be intermixed. Further, these contents may be intermixed with specification containers and packages authorized pursuant to 10 CFR §§71.12(a) and 71.12(b) provided the total transport index within the package based on fissile considerations does not exceed 50, the package is shipped as Fissile Class III with one (1) package per shipment and all other terms and conditions of this certificate are met.
9. For less than full loads, sufficient dunnage, shoring and/or bracing shall be utilized to minimize secondary impact of the secondary packaging within the cavity under normal and accident conditions.
10. Protrusions from secondary packaging such as lifting eyes, etc., shall be positioned such that they will not contact the cavity walls, or shoring shall be provided to prevent puncture of the cavity walls by the protrusions under the normal and accident conditions.
11. Radiation shielding as required shall be an integral part of the secondary packaging.
12. Contents shall be positioned in the cavity such that the center of gravity of the loaded package is substantially the same as the center of gravity of an empty package.
13. A leak test shall be conducted of each package prior to delivery to a carrier for transport to ensure that it is properly sealed. The leak test may be omitted if the contents meet the requirements of special form as defined in 10 CFR §71.4(o).
14. Shipment of liquids where freezing may be encountered must receive approval with regard to arrangements made to prevent freezing of the contents.
15. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR §71.12(b).
16. Expiration date: February 28, 1980.

REFERENCES

Westinghouse Electric Corporation application dated July 13, 1973.

Supplements dated: April 3 and June 7, 1979.

Mechanics Research, Inc., Report C2378, "Engineering Evaluation of the Super Tiger Overpack Designed for the Shipment of Large Quantities of Hazardous Materials."

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References: (Cont'd)

Nuclear Materials and Equipment Corporation's application dated September 17, 1971.

Supplement dated: January 6, 1972.

Nuclear Fuel Services, Inc. application dated July 6, 1979.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Charles E. MacDonald

Charles E. MacDonald, Chief
Transportation Certification Branch
Division of Fuel Cycle and
Material Safety

Date: JUL 12 1979