

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

|                                  |                         |   |                      |                            |
|----------------------------------|-------------------------|---|----------------------|----------------------------|
| 1.(a) Certificate Number<br>5450 | 1.(b) Revision No.<br>8 | 1.(c) Package Identification No.<br>USA/5450/AF | 1.(d) Pages No.<br>1 | 1.(e) Total No. Pages<br>5 |
|----------------------------------|-------------------------|---|----------------------|----------------------------|

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):<br>Westinghouse Electric Corporation<br>P.O. Box 355<br>Pittsburgh, PA 15230 | 3.(b) Title and identification of report or application:<br>Westinghouse Electric Corporation application<br>dated July 13, 1973, as supplemented |
| 3.(c) Docket No. 71-5450   |   |

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 Nos.: RCC, RCC-1, RCC-2, RCC-3, and RCC-4.

(2) Description

Steel fuel element cradle assembly consisting of a strongback and adjustable fuel element clamping assembly, shock mounted to a 14-gage steel outer container by shear mounts. Neutron absorber plates are required for the contents as specified.

(3) Drawings

Containers constructed in accordance with Westinghouse Electric Corporation Drawing Nos.: EDSK319401F, EDSK319402F, EDSK323133B, 684J580, for the RCC; 541F351, 684J861, 684J898, for the RCC-1; 684J963, 541F614 and EDSK323133B for the RCC-2; 1215E34, 1213E59, 1215E60, 1464F14 for the RCC-3; and 1596E22, 1596E23 and 1548E55 for the RCC-4.

(4) Fuel rod container reinforced 14-gage steel box constructed in accordance with Westinghouse Electric Corporation Drawing No. C56J0055.

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5. (b) Contents

(1) Type and form of material

(i) Uranium dioxide as zircaloy or stainless steel clad unirradiated fuel elements of the following specifications:

| <u>Type</u>                           | <u>15 x 15<br/>Zr Clad</u> | <u>14 x 14<br/>Zr Clad</u> | <u>14 x 14<br/>SST Clad</u> | <u>15 x 15<br/>SST Clad</u> |
|---------------------------------------|----------------------------|----------------------------|-----------------------------|-----------------------------|
| Pellet diameter (nom), in             | 0.367                      | 0.367                      | 0.384                       | 0.384                       |
| Rod diameter (nom), in                | 0.422                      | 0.422                      | 0.422                       | 0.422                       |
| Maximum fuel length, in               | 144                        | 144                        | 120                         | 122                         |
| Maximum rods/element                  | 204                        | 180                        | 180                         | 204                         |
| Maximum cross section (Nom),<br>in sq | 8.4                        | 7.8                        | 7.8                         | 8.4                         |
| Maximum U-235/element, kgs            | 15                         | 16                         | 18                          | 20                          |
| Maximum U-235/enrichment, w/o         | 3.2                        | 3.7                        | 3.9                         | 3.7                         |

(ii) Uranium dioxide as zircaloy or stainless steel clad unirradiated fuel elements. Two (2) neutron absorber plates consisting of 0.19" thick, full length stainless steel containing 1.3% minimum boron or 0.19" thick OFHC copper are required between fuel elements of the following specifications:

| Type                                   | 14x14      | 15x15      | 14x14       | 15x15       | 17x17                        | 11x11       | 16x16      | 14x14      |
|--|------------|------------|-------------|-------------|------------------------------|-------------|------------|------------|
|  | Zr<br>Clad | Zr<br>Clad | SST<br>Clad | SST<br>Clad | Zr<br>Clad                   | SST<br>Clad | Zr<br>Clad | Zr<br>Clad |
| Pellet diameter (nom), in              | 0.367      | 0.367      | 0.384       | 0.384       | 0.308-0.322                  | 0.503       | 0.322      | 0.3805     |
| Rod diameter (nom), in                 | 0.422      | 0.422      | 0.422       | 0.422       | 0.360-0.374                  | 0.567       | 0.374      | 0.44       |
| Maximum fuel length, in                | 144        | 144        | 120         | 120         | 168                          | 65.7        | 144        | 144        |
| Maximum rods/element                   | 180        | 204        | 180         | 204         | 264*                         | 117         | 235        | 176        |
| Maximum cross section,<br>(nom), in sq | 7.8        | 8.4        | 7.8         | 8.4         | 8.4                          | 8.7         | 7.8        | 7.98       |
| Maximum U-235/element,<br>kgs          | 17         | 18         | 18.5        | 20.5        | 16.25(144"L)<br>19.0 (168"L) | 9.3         | 14.5       | 19.0       |
| Maximum U-235 enrich-<br>ment, w/o     | 3.85       | 3.59       | 4.0         | 4.0         | 3.5                          | 4.3         | 3.5        | 3.85       |

\*Guide thimbles to be as shown in Figure 1 of application dated February 5, 1974 for the 3.5 w/o enriched UO<sub>2</sub> fuel and Figure 1 of application dated June 29, 1978 for the 3.25 w/o enriched UO<sub>2</sub> fuel.

5. (b) Contents (continued)

(1) Type and form of material (continued)

(iii) Uranium dioxide as zircaloy or stainless steel clad-  
unirradiated fuel rods of the following specifications:

| Type                          | SST Clad | Zr Clad | Zr Clad |
|-------------------------------|----------|---------|---------|
| Pellet diameter (nom), in     | 0.384    | 0.367   | 0.322   |
| Rod diameter (nom), in        | 0.422    | 0.422   | 0.374   |
| Fuel length (max), in         | 144      | 144     | 168     |
| Maximum U-235 enrichment, w/o | 3.9      | 3.7     | 3.5     |

(2) Maximum quantity of material per package

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

Two fuel elements.

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

Two inner containers described in 5(a)(4) containing not more than 80 kilograms U-235.

(c) Fissile Class II and III

(1) Minimum transport index to be shown  
on label for Class II 1.5

(2) Maximum number of packages per  
shipment for Class III 60

6. Fuel rods shall be closely packed in the fuel rod container on no more than an equivalent metal-to-metal square lattice. Partially loaded fuel rod containers shall be fitted with a minimum of three, equally spaced blocks, of which the noncombustible portion of the blocks and the method by which they are secured shall assure that the rods are maintained on no more than an equivalent metal-to-metal square lattice within the fuel rod container.

7. Each fuel assembly shall be unsheathed or shall be enclosed in an unsealed, polyethylene sheath which will not extend beyond the ends of the fuel assembly. The ends of the sheath shall not be folded or taped in any manner that would prevent the flow of liquids into or out of the sheathed fuel assembly.

Alternatively, the fuel assembly may be enclosed in an elongated plastic bag or sheath along its full length. At the bottom end of the fuel assembly, the bag will be cut off or folded back to assure that the entire cross section of the lower end of the assembly is unobstructed. When folding is used, the portion of the sheath that

is folded back will be cinched with tape near its end to hold it in place, and the length will be such that when the assembly is loaded in the packaging, the folded sheath will be clamped in place in at least two grid locations. The top end of the bag may be gathered together and taped closed. However, the top end then will be slit on all four sides. The slits will run perpendicular to the axis of the assembly and will extend the inner distance between the top nozzle pads and spring clamps (approximately 60% of the length of each side). The slits will be made in a plane near that formed by the top of the pads and clamps.

8. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR §71.12(b).
9. Expiration date: July 31, 1980.

REFERENCES

Westinghouse Electric Corporation application dated July 13, 1973.

Supplements dated: February 5, 1974; March 19, 1975; April 27 and June 4, 1976; August 2, 1977; June 29, 1978; and October 22, 1979 (WRD-LS&S-859).

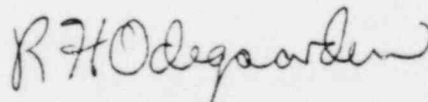
For The 11 x 11 SS Clad Fuel Elements Described In 5(b)(1)(ii) and Limited In 5(b)(2)(i)


Energy Research and Development Administration, Richland Operations Office, application dated July 16, 1976.

For The Model No. RCC-4 Packaging

Westinghouse Electric Corporation supplement dated April 2, 1980.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION



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

Date: MAY 09 1980