



71-5450

Westinghouse
Electric Corporation

Commercial Nuclear
Fuel Division

Drawer R
Columbia SC 29250
(803) 776 2610

NRC-96-049

September 30, 1996

U.S. Nuclear Regulatory Commission
ATTN: William D. Travers, Director
Spent Fuel Project Office
Office of Nuclear Material Safety & Safeguards
Washington, DC 20555-0001

Dear Mr. Travers:

SUBJECT: RCC SHIPPING CONTAINER COC (USA/5450/AF)

The Westinghouse Electric Corporation does not intend to request renewal of the existing USNKC Certificate of Compliance USA/5450/AF that expires September 30, 1996. Enclosed for reference is a copy of the current certificate.

If you have any questions or require additional information, please write to me at the above address or telephone me at (803) 776-2610, Extension 3426.

Sincerely,

WESTINGHOUSE ELECTRIC CORPORATION

C. F. Sanders, Manager
Nuclear Materials Safety and Safeguards

Enclosure

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The Westinghouse Commercial Nuclear Fuel Division — Winner of the 1988 Malcolm Baldrige National Quality Award

NTD1

CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIALS PACKAGES

U.S. NUCLEAR REGULATORY COMMISSION

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. PACKAGE IDENTIFICATION NUMBER	d. PAGE NUMBER	e. TOTAL NUMBER PAGES
5450	33	USA/5450/AF	1	7

2. PREAMBLE

- This certificate is issued to certify that the packaging and contents described in item 5 below, meets the applicable safety standards set forth in Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material."
- 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
a. ISSUED TO (Name and Address) b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION:

Westinghouse Electric Corporation
P.O. Box 355
Pittsburgh, PA 15230

Westinghouse Electric Corporation
application dated December 20, 1985,
as supplemented.

c. DOCKET NUMBER 71-5450

4. CONDITIONS
This certificate is conditional upon fulfilling the requirements of 10 CFR Part 71, as applicable, and the conditions specified below.

5.

(a) Packaging

(1) Model Nos.: RCC, RCC-1, 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-gauge steel outer container by shear mounts. Neutron absorber plates are required for the contents as specified. Gross weight for the RCC is 6,300 lbs., RCC-1 and RCC-3 is 7,200 lbs., and RCC-4 is 8,400 lbs.

(3) Drawings

The packagings are constructed in accordance with the following Westinghouse Electric Corporation Drawing Nos.:

For the RCC packaging: RCCL002, Sheets 1 through 3, Rev. 2.
For the RCC-1 packaging: RCCL102, Sheets 1 through 3, Rev. 2.
For the RCC-3 packaging: RCCL302, Sheets 1 through 3, Rev. 2.
For the RCC-4 packaging: RCCL402, Sheet 1, Rev. 3; Sheets 2 through 3, Rev. 2.

(4) Fuel rod container reinforced 13-gauge steel box constructed in accordance with Westinghouse Electric Corporation Drawing No. C5650D55, Rev. 7.

(5) Dimensions and placement of neutron absorber plates in accordance with unnumbered drawing attached to Westinghouse Letter # LA 89-19 dated 2/14/89.

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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. Two 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 Zr Clad	15x15 Zr Clad	14x14 SST Clad	15x15 SST Clad	17x17 Zr Clad	16x16 Zr Clad	14x14 Zr Clad
Pellet diameter (nom), in	0.344- 0.367	0.367	0.384	0.384	0.308- 0.322	0.322	0.3805
Rod diameter (nom), in	0.400- 0.422	0.422	0.422	0.422	0.360- 0.374	0.374	0.44
Maximum fuel length, in	144	144	120	120	168	144	144
Maximum rods/ element	180	204	180	204	264	235	176
Maximum cross section, (nom), in sq	7.8	8.4	7.8	8.4	8.4	7.8	7.98
Maximum U-235/ element, kg	17.7 (14.9"L)	18.1 (15.3"L)	18.1 (15.3"L)	18.1 (15.3"L)	16.95 (14.1"L)	16.6 (13.8"L)	19.0 (15.8"L)
Maximum U-235 enrichment, w/o	4.0	3.65	4.0	3.65	3.65	4.0	3.85

- (ii) Uranium dioxide as Zircaloy clad unirradiated fuel elements contained within the Model N-4 RCC-4 packaging. Two neutron absorber plates consisting of 0.19" thick stainless steel are required between fuel elements of the following specifications:

Type	17x17 Zr Clad
Pellet diameter, in	0.308 - 0.322
Rod diameter, in	0.360 - 0.374
Maximum fuel length, in	168
Maximum rods/element	264
Maximum cross section (nom) in sq	8.4
Maximum U-235/element, kg	19.3
Maximum U-235 enrichment, w/o	3.55

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5.(b) (1) Type and form of material (continued)

(iii) Uranium dioxide as Zircaloy clad unirradiated fuel elements. Two neutron absorber plates consisting of carbon steel, 0.035 inches in thickness, with a cermet Gd_2O_3 coating affixed to each side providing a total of 0.054 g- Gd_2O_3/cm^2 for both sides of the plate, are required between fuel elements of the following specifications:

Type	14x14 Zr Clad	15x15 Zr Clad	14x14 SST Clad	15x15 SST Clad	17x17 Zr Clad	17x17 Zr Clad	16x16 Zr Clad	16x16 Zr Clad
Pellet diameter (nom), in	0.344- 0.367	0.367	0.384	0.384	0.322	0.308	0.322	0.325
Rod diameter (nom), in	0.400- 0.422	0.422	0.422	0.422	0.374	0.360	0.374	0.382
Maximum fuel length, in	184	144	120	120	168	168	144	150
Maximum rods/ element	20	204	180	204	264	264	235	236
Maximum cross section, (nom), in sq	7.8	8.4	7.8	8.4	8.4	8.4	7.8	7.98
Maximum U-235/ element, kg	22.1	21.1	23.4	22.0	21.75 (144" L)	19.8 (144" L)	20.7	21.1
Maximum U-235 enrichment, w/o	0	0	0	0	0.7	0.7	5.0	5.0

Type

Pellet diameter (nom), in	0.367
Rod diameter (nom), in	0.422
Maximum fuel length, in	141.8
Rods/element	208
Maximum cross section, (nom), in sq	8.5
Maximum U-235/ element, kg	17.8
Maximum U-235 enrichment, w/o	3.95

15x15 Zr Clad
(B&W Type)

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5.(b) (1) Continued

- (iv) Uranium dioxide as Zircaloy clad unirradiated fuel elements containing a minimum of 48 IFBA rods and 25 Instrument/Guide tubes per specification and loading pattern described in Westinghouse drawing SKA-89044, Sheet 1, Rev. 2. Two neutron absorber plates consisting of carbon steel, 0.035 inches in thickness, with 4 mils of Gd_2O_3 ($0.02 \text{ gm-Gd}_2O_3/\text{cm}^2$) affixed to each side of the plate are required between fuel elements of the following specifications:

Type	17 x 17 Zr Clad
Pellet diameter (nom), in	0.308
Rod diameter (nom), in	0.360
Maximum fuel length, in	168
Maximum rods/ element	264
Maximum cross section (nom), in sq	8.4
Maximum U-235/ element, kg	22.5 (144"L)
Minimum ZrB ₂ rod assembly	48
Minimum ZrB ₂ IFBA length, in	108
Maximum U-235 enrichment, w/o	4.85

- (v) Uranium dioxide as Zircaloy clad unirradiated fuel elements. Two neutron absorber plates consisting of carbon steel 0.035 inches in thickness, with 4 mils of Gd_2O_3 ($0.02 \text{ gm-Gd}_2O_3/\text{cm}^2$) affixed to each side of the plate are required between fuel elements of the following specification:

Type	17 x 17 Zr Clad
Pellet diameter (nom), in	0.308
Rod diameter (nom), in	0.360
Maximum fuel length, in	168
Maximum rods/element	264
Maximum cross section (nom), in sq	8.4
Maximum U-235/element, kg	22.5 (144"L)
Maximum U-235 enrichment, w/o	4.85

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5.(b) (1) Continued

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

Type	SST Clad	Zr Clad	Zr Clad	Zr Clad	Zr Clad	Zr clad
Pellet diameter (nom), in	0.384	0.344- 0.367	0.308- 0.322	0.322	0.3805	0.325
Rod diameter, in	0.422	0.400- 0.422	0.360- 0.374	0.374	0.44	0.382
Fuel length (max), in	120	140	168	144	144	150
U-235 enrichment (max), w/o						
Note (1)	4.0	4.0	3.65	4.0	3.85	---
Note (2)	4.2	4.2	4.3	4.3	---	4.2
Note (3)	---	---	3.55	---	---	---

Notes:

- (1) Two neutron absorber plates consisting of 0.19-inch thick, full length stainless steel containing 1% (minimum) boron or 0.19-inch thick OFHC copper are required between the rod boxes.
- (2) Two neutron absorber plates consisting of carbon steel, 0.035 inch in thickness, with 4 mils of Gd_2O_3 (minimum 0.02 gm $\text{Gd}_2\text{O}_3/\text{cm}^2$) affixed to each side of the plate are required between the rod boxes.
- (3) Two neutron absorber plates consisting of 0.19-inch thick carbon steel are required between the rod boxes.

- (vii) Unirradiated, uranium dioxide, zircaloy clad fuel elements, with annular pellets at the top and bottom ends of the active fuel length. Two neutron absorber plates consisting of carbon steel, 0.035 inches in thickness, with a cermet Gd_2O_3 coating affixed to each side providing a total of 0.054 g- $\text{Gd}_2\text{O}_3/\text{cm}^2$ for both sides of the plate, are required between fuel elements. The fuel assemblies shall be held in place by at least 7 clamping frame arms. Specifications for the fuel elements are as follows:

Type	14x14	14x14 CE-1
Pellet diameter (nom), in	0.3444	0.3765
Annular pellet inner diameter (nom), in	0.172	0.183
Rod diameter (nom), in	0.000	0.4400
Maximum active fuel length (nom), in	144	136.25
Solid pellet stack length, in	132	122.65
Annular pellet stack length at the top and bottom ends of the active fuel length, in	6	6.8
Rods/element	179	176
Maximum cross section, (nom), in sq	7.8	8.110
Maximum U-235/element, kg	18.1	18.6
Maximum U-235 enrichment, w/o	5.0	4.8

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5. (b) (2) Maximum quantity of material per package

(i) For the contents described in 5(b)(1)(i), 5(b)(1)(ii), 5(b)(1)(iii), 5(b)(1)(iv), and 5(b)(1)(vii):

Two fuel elements

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

One fuel element

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

Two inner containers containing not more than 80 kilograms U-235

(c) Transport Index for Criticality Control

Minimum transport index to be shown on label for nuclear criticality control:

6. Fuel rods must be closely packed in the fuel rod container or no more than an equivalent metal-to-metal square lattice. Partially loaded fuel rod containers must 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 must 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 must be sheathed or must be enclosed in an unsealed, polyethylene sheath which will not extend beyond the ends of the fuel assembly. The ends of the sheath must 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. Use of packaging fabricated after February 28, 1986, is not authorized.

9. The gross weight must not exceed 6,300 pounds for the RCC packaging, 7,200 pounds for the RCC-1 and RCC-3 packagings, and 8,400 pounds for the RCC-4 packaging.

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10. In addition to the requirements of Subpart G of 10 CFR Part 71:
- (a) The package must be maintained in accordance with the maintenance procedures submitted with Westinghouse supplements dated June 20, September 16, and September 19, 1991.
 - (b) The package must be prepared for shipment and operated in accordance with the operating procedures submitted with Westinghouse supplements dated June 20, September 16, and September 19, 1991.
11. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR §71.12.
12. Expiration date: September 30, 1996.

REFERENCES

Westinghouse Electric Corporation application dated December 20, 1985.

Supplements dated: April 28, July 1, 21, 1986; January 4, February 14, April 18, October 5, and November 20, 1989; March 5, April 17, June 20, September 16, September 19, and September 24, 1991; February 11, March 21, and May 27, 1991.

Department of Energy supplement dated March 1, 1984.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

William D. Travers, Director
Spent Fuel Product Office
Office of Nuclear Material Safety
and Safeguards

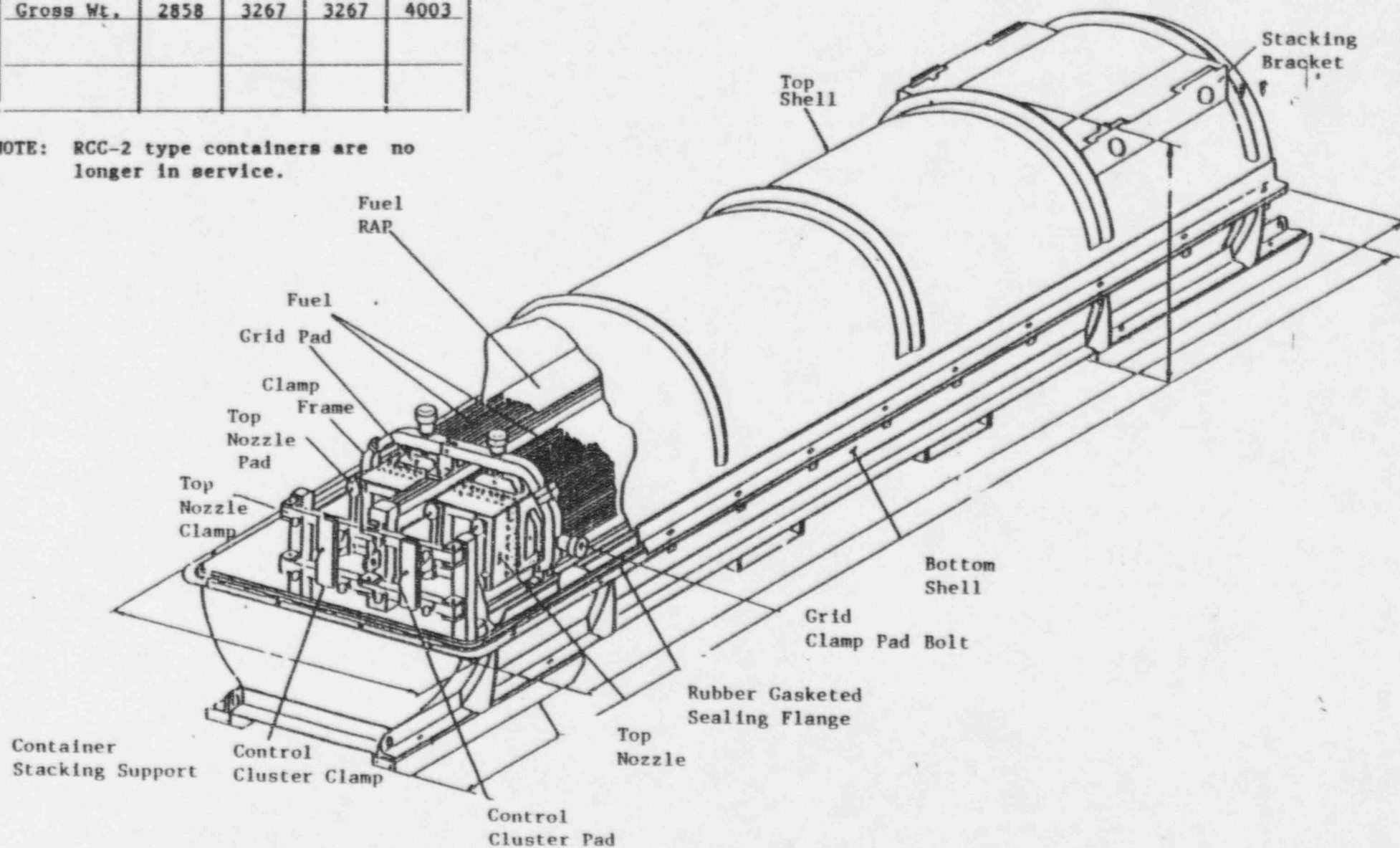
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UNITS: mm, kg

ITEM	CONTAINER TYPE			
	RCC	RCC-1	RCC-3	RCC-4
Length	4267	4852	4941	5512
Maximum Gross Wt.	2858	3267	3267	4003

NOTE: RCC-2 type containers are no longer in service.



WESTINGHOUSE RCC MODEL SHIPPING CONTAINERS
FOR 14x14, 15x15, 16x16, 17x17 FUEL ASSEMBLIES