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Department of Energy
Washington, D.C. 20585

December 13, 1979

NR:RR:WCHuffman G#6529



Manager, Pittsburgh Naval Reactors Office

Manager, Schenectady Naval Reactors Office

MODEL 235R001 NEW FUEL SHIPPING CONTAINER - REVISION TO THE CERTIFICATE OF COMPLIANCE TO INCLUDE D2W FUEL CELLS AS AUTHORIZED CONTENTS; FORWARDING OF

Department of Energy Certificate of Compliance USA/6386/BF has been revised to include unirradiated D2W fuel cells as authorized contents of the Model 235R001 new fuel shipping container. Specifically, Naval Reactors memorandum G#6373 dated September 4, 1979 requested Nuclear Regulatory Commission concurrence that two side or central D2W fuel cells with control rods or two corner D2W fuel cells, unrodded, be included as authorized contents of the Model 235R001 new fuel shipping container. The Naval Reactors memorandum stated that the shipment of two D2W fuel cells per container, with four containers per transport vehicle will have a safety margin as great as previously authorized fuel cells for the Model 235R001 container and complies with Code of Federal Regulations (10CFR71) shipping requirements.

Nuclear Regulatory Commission memorandum FCTC:JEJ 71-6386 dated December 3, 1979 (Enclosure 1) concurred that the shipment of D2W fuel cells in the Model 235R001 container, with two cells per container and up to four containers per transport vehicle complies with 10CFR71 requirements. Accordingly, Naval Reactors has issued Revision 6 to Certificate of Compliance USA/6386/BF which is forwarded for use as Enclosure (2).

The action taken by this memorandum is considered by the Government to be within the contractual scope of the applicable prime contract and does not authorize any delay in delivery or additional cost to the Government, either direct or indirect.

C. H. Oosterman
C. H. Oosterman
Division of Naval Reactors

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- Enclosures: (1) U. S. Nuclear Regulatory Commission Memorandum FCTC:JEJ 71-6386 dated December 3, 1979
(2) Certificate of Compliance USA/6386/BF (DOE-NR)

Copy to: see page 2



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Manager, PNRO
Manager, SNRO

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G#6529

Copy to:

Manager, PNRO (2)
Manager, SNRO (2)
General Manager, Bettis (w/o enclosures)
General Manager, KAPL (w/o enclosures)
Manager, Shipping Container Analysis, Bettis
Manager, Fuel Shipping Containers, KAPL
Dr. W. E. Mott, Director, Division of Environmental
Control Technology, DOE (3) (w/enclosure (2))
D. A. Nussbaumer, Fuel Cycle and Material Safety,
NRC (w/enclosure (2))
C. E. MacDonald, Fuel Cycle and Material Safety,
NRC (w/enclosure (2)) ←
Manager, Special Nuclear Materials, KAPL
C. Oddis, PNR

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U.S. DEPARTMENT OF ENERGY
CERTIFICATE OF COMPLIANCE
For Radioactive Materials Packages

ENCLOSURE (2) to
G# 6529

1a. Certificate Number USA/6386/BF(DOE-NR)	1b. Revision No. 6	1c. Package Identification No. USA/6386/BF(DOE-NR)	1d. Page No. 1	1e. Total No. Pages. 7
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2. PREAMBLE

- 2a. 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).
- 2b. The packaging and contents described in item 5 below, meets the safety standards set forth in Subpart C of Title 19, Code of Federal Regulations, Part 71, "Packaging of Radioactive Material for Transport and Transportation of Radioactive Material Under Certain Conditions."
- 2c. 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—

(1) Prepared by (Name and address): Jettis Atomic Power Laboratory P.O. Box 79, W. Mifflin, Pa. 15122 Mgr., Refueling Engineering & Operations Jettis Atomic Power Laboratory P.O. Box 1072, Schenectady, NY 12301 Attention: Mgr., CGN Reactor Servicing	(2) Title and identification of report or application: Safety Analysis Report for Packaging for the Model 235R001 Module Shipping and Storage Container (See listing pg. 6)	(3) Date: listing pg. 6
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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. Description of Packaging - Title - Model 235R001 Model Shipping and Storage Container

The Model 235R001 Shipping Container was originally designed to protect nonirradiated fuel modules of the A1G/A4W type. Subsequently, the container was adapted to ship (1) A1W-3 fuel modules using a strongback, (2) partial A1W-R3 fuel cells using Module Support Assemblies, (3) S8G fuel cells (either standard size or partial) by use of a special frame assembly, cradle clamps, (4) S3G-3 refueling cells using cell support assemblies, (5) D1G Core 2 Cell Assemblies and RFAs using special frame assemblies, (6) A4W/A1G fuel clusters using a modified A4W/A1G fuel cell shipping frame, (7) ASNPP Spare Modules using a Module Support Assembly or (8) D2W side, central or corner fuel cells. The container structure is horizontal, having an oblong cross section and is fabricated from carbon steel sheet type (AISI 1010, 0.104 inch thick). The container is 313 inches long and weights approximately 4,500 pounds, empty. The cross section is essentially 17 inches radius separated by 1.5 inches giving approximate inside dimensions of 35.5 inches high by 33 inches wide.

(1) A1W Fuel Cell in Model 235R001 Gr 3 Container

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The upper cover is removed to load and unload the A1W-3 strongback/module assembly. The strongback/module assembly is suspended within the lower section of the container structure from 14 elastic shear mounts. The maximum

6a. Date of Issuance: 13 December 1979

6b. Expiration Date: None

FOR THE U.S. DEPARTMENT OF ENERGY

7a. Address (of DOE Issuing Office)

Division of Naval Reactors
U.S. Department of Energy
Washington, D.C. 20545

7b. Signature, Name, and Title (of DOE Approving Official)

J. W. Vaughan
J. W. Vaughan, Deputy Director
Division of Naval Reactors

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(4) S8G Standard and Partial Fuel Cells in Model 235R001 Gr 5 and Gr 6 Container

The upper cover is removed to load and unload the standard or partial size S8G fuel cells into the container inner frame assembly. The frame assembly is suspended within the lower section of the container structure from 14 elastic shear mounts. The fuel cells are restrained in the container by means of cradle and clamp assemblies bolted to the frame assembly. Fore and aft restraint is provided by securing the control rod holddown device to the forward stops bolted to the frame assembly. A fuel cell may contain either a regular control rod or a poison rod and be fitted with either a regular support adapter or a substitute support adapter. The shipping container, loaded with two standard size fuel cells weighs 11,100 pounds.

(5) S3G-3 Refueling Cells in Model 235R001 Gr 7 Container

The upper cover is removed to load and unload the S3G-3 refueling cells into the container Cell Support Assemblies which are suspended within the lower section of the container structure by 16 elastic shear mounts. The fuel cells are restrained laterally in the container by clamp and cradle assembly bolted to the side rails of the Cell Support Assembly. Fore and aft restraint is provided by the axial clamp and cradle assembly. The shipping container when loaded with two refueling cells as shown on Westinghouse Drawing 1175J45 has a maximum weight of 10,191 pounds.

(6) D1G Core 2 New Fuel Cells and RFAs in Model 235R001 Gr 8 and Gr 9 Containers

The upper cover is removed to load and unload the D1G Core 2 fuel cells or RFAs into or out of the container frame assembly. The frame assembly is suspended within the lower section of the container structure from 12 elastic shear mounts for the fuel cells and six elastic shear mounts for the RFAs. The fuel cells are restrained in the frame assembly by means of cradle, adapter and clamp assemblies which also provide fore and aft restraint. Crush tubes at each end of each fuel cell provide for travel limit in the event of an accident. Four RFAs in their container are secured in a shipping frame by means of five clamps for each RFA. The loaded D1G Core 2 fuel cell container weighs no more than 9,616 pounds and loaded RFA container weighs no more than 7,377 pounds.

(7) A4W/A1G New Fuel Cluster in Model 235R001 Gr 10 Containers

The upper cover is removed to load and unload two A4W/A1G fuel clusters or one fuel cluster and one counterweight into or out of the container frame assembly. The frame assembly is suspended within the container base assembly by sixteen (16) elastic shear mounts. The fuel clusters or counterweight are restrained vertically and transversely by ten (10) clamp and cradle assemblies and each is restrained longitudinally by a forward stop assembly. A fuel cluster may contain either a normal control rod or a special shipping and storage poison rod. The maximum loaded container weight is 12,421 pounds.

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(8) ASNPP Spare Modules in Model 235R001 Gr 11 Container

The upper cover is removed to load and unload the ASNPP spare modules into the container module support assembly which is suspended within the lower section of the container structure by 18 elastic shear mounts. The module is restrained laterally in the container by clamp assemblies bolted to the side rails of the Module Support Assembly. Fore and aft restraint is provided by the axial clamp assembly. The shipping container when loaded with one ASNPP spare module as shown on Westinghouse Drawing 1203J86 has a maximum weight of 9,912 pounds.

(9) D2W Side, Central or Corner Cells in Model 235R001 Gr 12 & Gr 13 Containers

The upper cover is removed to load and unload the D2W fuel cells into or out of the container frame assembly. The frame assembly is suspended within the lower section of the container structure from 22 elastic shear mounts. The fuel cells are restrained in the frame assembly by supports (four of which are integral parts of the frame assembly and two are bolted in place) and caps. Axial restraint is provided by a mid stop which is an integral part of the frame assembly, and by end stops which are bolted in place after the fuel cells are installed. The container loaded with side or central cells weighs no more than 11,400 pounds and the container with corner cells weighs no more than 7,700 pounds.

b. Authorized Contents

The authorized contents for each container are as follows:

- (1) Model 235R001 Gr 3 Container - One A1W-3 module without upper mechanism and with control rod, leadscrew, and control rod holddown device (Westinghouse Drawing 951F060) installed on rodded type modules.
- (2) Model 235R001 Gr 1 Container - One A1G or A4W reactor cell without upper mechanism and with control rod, leadscrew and shipping fixture (General Electric Drawing 105D1550) installed on rodded type modules.
- (3) Model 235R001 Gr 2 Container - One A4W Reactor Test Assembly (RTA)
- (4) Model 235R001 Gr 4 Container - Two A1W-R3 Partial Lower Modules (control rods may be installed in the rodded fuel modules but are not necessary for criticality control during transport).

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- (5) Model 235R001 Gr 5 Container - One or two standard size S8G clusters, each with regular or substitute support adapter and with control rod or shipping poison rod and with control rod holddown device installed per General Electric Drawing 299E179 (Note: If only one cell is shipped per container, a dummy load/GE Dwg. 296E130/is installed for balance).
- (6) Model 235R001 Gr 6 Container - One or two partial size S8G clusters, each with regular or substitute support adapter and with control rod or shipping poison rod and with control rod holddown device installed per General Electric Drawing 299E179. (Note: If only one cell is shipped per container, a dummy load/GE Dwg. 296E130/is installed for balance).
- (7) Model 235R001 Gr 7 Container - One or two S3G-3 refueling cells but a maximum of one 0-1 Reactor Cell Assembly per Container.
- (8) Model 235R001 Gr 8 Container - One or two D1G Core 2 new fuel cells each with a control rod shipping plug (GE Dwg. 258E679) installed.
- (9) Model 235R001 Gr 9 Container - Up to four D1G Core 2 RFAs.
- (10) Model 235R001 Gr 10 Container - One or two A4W/A1G new fuel clusters each with either a normal control rod or a special shipping and storage poison rod installed. (Note: If only one cluster is shipped per container, a counterweight (Westinghouse Drawing 928E039) is installed for balance).
- (11) Model 235R001 Gr 11 Container - One full sized or corner ASNPP module per container. Rodded modules shall have the rod holddown per Westinghouse Drawing 1230D58 installed. Fixed rod modules shall have the fixed rod installed and bolted to the manifold.
- (12) Model 235R001 Gr 12 Container - One or two D2W new fuel cells (either side and/or central) each with a control rod and control rod holddown device (Westinghouse Dwg. 1238D01) installed.
- (13) Model 235R001 Gr 13 Container - One or two D2W new corner fuel cells.

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c. Restrictions

- (1) Shipments will be made in accordance with Fissile Class III requirements.
- (2) Shipments shall consist of materials as listed in 5.b(1) with no more than 18 loaded containers per vehicle or hold; or
- (3) Shipments shall consist of materials listed in 5.b(2), (3), (4), (5) and (6), (7), (8) and (9), (10) or, (12) and (13) with no more than four loaded containers per vehicle or hold.
- (4) Shipments shall consist of materials listed in 5.b(11) with no more than four loaded containers per vehicle or hold including no more than one peripheral module per shipment.

d. References:

Technical Manual - A4W/A1G Reactor Cell and RTA Shipping and Storage Container, NAVSHIPS 0989-030-6000.

e. Additional Information

Division of Materials Licensing memoranda dated December 10, 1970 and June 30, 1971 stated that the contents and packaging of the Model 235R001 new fuel shipping container complies with the requirements of 10 CFR 71 for shipment of A1W-3 fuel modules or A1G, A4W or RTA reactor cells respectively. Directorate of Licensing memorandum dated May 1, 1973 stated that the contents and packaging of the Model 235R001 new fuel shipping container complies with the requirements of 10 CFR 71 for A1W-3 partial lower modules. Naval Reactors memorandum G#5078 dated January 26, 1976 forwarded Bettis letters WAPD-OP(R)C-268 dated July 23, 1973, WAPD-OP(R)C-477 dated December 31, 1975, and WAPD-OP(R)C-481 dated January 19, 1976 to the Nuclear Regulatory Commission for information. Nuclear Regulatory Commission memorandum FCTR:CRM 71-6386 dated January 6, 1978 stated that the contents and packaging of the Model 235R001 new fuel shipping container complies with the requirements of 10 CFR 71 for S8G standard and partial fuel cells and for S3G-3 refueling cells. Nuclear Regulatory Commission memorandum FCTR:JEJ 71-6386 dated March 6, 1978 stated that the contents and packaging of the Model 235R001 new fuel shipping container complies with the requirements of 10 CFR 71 for D1G Core 2 new fuel cells or RFAs. Nuclear Regulatory Commission memorandum FCTR:JEJ 71-6386 dated March 13, 1978 stated that the contents and packaging of the Model 235R001 new fuel shipping container complies with the requirements of 10 CFR 71 for A4W/A1G new fuel clusters. Nuclear Regulatory Commission Memorandum FCTR:JEJ 71-6386 dated September 27, 1978 stated that the contents and packaging of the Model 235R001 new fuel shipping container complies with the requirements of 10CFR71 for S8G fuel clusters with regular or substitute support adapters and with regular control rods or poison rods.

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Nuclear Regulatory Commission memorandum FCTR:JEJ 71-6386 dated May 1, 1979 stated that the contents and packaging for the Model 235R001 Cr 11 new fuel shipping and storage container complies with the requirements of 10 CFR 71 for ASNPP.

Nuclear Regulatory Commission memorandum FCTC:JEJ 71-6386 dated December 3, 1979 stated that the contents and packaging of the Model 235R001 new fuel shipping container complies with the requirements of 10 CFR 71 for D2W side, central or corner cells.

3.a(2) and 3.a(3)

Supporting data which indicates compliance with both the normal and accident transportation conditions are contained in the following documents:

AlG/A4W Reactor Cell or Fuel Cluster in Group 1, 2, or 10 Container

- a. KAPL letter AlG 25-159 dated October 2, 1970
- b. KAPL letter AlG 25-181 dated April 9, 1971
- c. KAPL letter AlG 25-191 dated May 11, 1971
- d. Naval Reactors memorandum NR:RR:LMWissel G#5923 dated February 22, 1978

AlW Fuel Cell in Group 3 or 4 Container

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- e. Bettis letter WAPD-OP(R)RD-357 dated August 11, 1970
- f. Bettis letter WAPD-OP(R)RD-444 dated October 9, 1970
- g. Bettis letter WAPD-OP(R)RD-476 dated October 26, 1970
- h. Bettis letter WAPD-OP(R)RD-488 dated October 30, 1970
- i. Bettis letter WAPD-OP(R)C-94 dated May 16, 1972
- j. Bettis letter WAPD-OP(R)C-199 dated December 13, 1972
- k. Bettis letter WAPD-OP(R)C-229 dated March 6, 1973
- l. Bettis letter WAPD-OP(R)C-268 dated July 23, 1973
- m. Bettis letter WAPD-OP(R)C-477 dated December 31, 1975
- n. Bettis letter WAPD-OP(R)C-481 dated January 19, 1976

S8G Standard and Partial Fuel Cells in Group 5 or 6 Container

- o. Naval Reactors memorandum NR:RR:LMWissel G#5776 dated September 8, 1977
- p. Naval Reactors memorandum NR:RR:LMWissel G#6095 dated August 17, 1978

S3G-3 Refueling Cells in Group 7 Container

- q. Naval Reactors memorandum NR:RR:LMWissel G#5776 dated September 8, 1977

D1G Fuel Cells in Group 8 or 9 Container

- r. Naval Reactors memorandum NR:RR:LMWissel G#5905 dated January 23, 1978

ASNPP Spare Module in Group 11 Container

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- s. Naval Reactors memorandum NR:RR:LMWissel G#6208 dated March 8, 1979

D2W Side, Central or Corner Fuel Cells in Group 12 or 13 Container

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- t. Naval Reactors memorandum NR:RR:LMWissel G#6373 dated September 4, 1979