NRC FORM 618 (8-2000) 10 CFR 71			U.S. NUCLEAR REGULATORY COMMISSION		
CERTIFICATE OF COMPLIANCE FOR RADIOACTIVE MATERIAL PACKAGES					
1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. DOCKET NUMBER	d. PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES
9793	12	71-9793	USA/9793/B(U)F-85	1 OF	7

2. PREAMBLE

a. This certificate is issued to certify that the package (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."

b. 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)*

U. S. Department of Energy
Division of Naval Reactors
Washington, D.C. 20585

b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION

"Core Independent M-140 Safety Analysis Report for Packaging" transmitted February 27, 1991, as supplemented

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 No.: M-140

(2) Description

The M-140 is a stainless steel cask for transporting spent fuel. The cask is a right circular cylinder and is transported in the upright position. The package's approximate dimensions and weights are as follows:

Cavity diameter	70 inches
Cavity height	46 inches
Body outer diameter	98 inches
Body steel wall thickness	14 inches
Package overall outer diameter	126 inches
Package overall height	194 inches
Packaging weight, including standard internals	315,000 pounds
Maximum package weight, including contents	375,000 pounds

The cask body is made from 304 stainless steel forgings. The cask walls are 14-inches thick and the bottom plate is 12-inches thick. The cask body flange provides a seating surface for the closure head and its protective dome. The flange contains 36 wedge assemblies located radially around the inside diameter. Retention of the closure head is achieved by engaging the wedges in a tapered groove in the circumferential edge of the closure head. The cask body has 180 external cooling fins welded to the exterior wall. A support ring is welded to the external cooling fins at a point above the center of gravity. The support ring seats on, and is

5.(a)(2) Description (continued)

bolted to, the railcar mounting ring during transport. For sea transport, the center section of the railcar is shipped with the package and serves as the package support structure. The cask bottom is equipped with an energy absorber which is composed of five concentric stainless steel rings varying in thickness and height.

The closure head is made from forged 304 stainless steel and is approximately 13-inches thick and 81.7 inches in diameter. The closure head is equipped with an access port, which is approximately 24 inches in diameter, and is offset from the center of the closure head. The access port plug is a stepped design with a maximum diameter of approximately 31 inches and is attached to the closure head by 24 bolts. The closure head and access port are sealed with double ethylene propylene O-ring seals. Seal test ports are provided for the closure head and access port seals. A stainless steel protective dome is positioned over the closure head and is secured to the cask body flange by 12, 1.38-inch diameter, 38.5-inch long studs installed in a vertical direction and 6, 2.5-inch diameter, 9-inch long shear bolts installed in the radial direction.

The containment system is composed of the cask body, the closure head, and the closure head access port plug. There are seven penetrations in the standard containment system: a closure head, a drain port, a vent port, and an access port in the closure head, a thermocouple penetration, a water inlet penetration, and a water outlet penetration in the cask body. Each penetration is sealed with a plug and a double ethylene propylene O-ring seal and is equipped with a leak test port. For some shipping configurations, two additional penetrations may be present in the closure head: a removable fuel assembly (RFA) access port and another vent penetration.

The spent fuel modules are positioned in an internals assembly. The internals assembly is composed of stacked internal spacer plates which have openings for the spent fuel modules. The internals assembly has a top plate or top plate subassembly which is preloaded by springs against a retaining ring fitted in a groove in the cask cavity wall. The internals assembly may be a standard, Type 1, Type 2, or Type 3 internals assembly.

(3) Drawings

The packaging is constructed and assembled in accordance with the Westinghouse Electric Corporation Drawings in Appendix 1.3.2 of the application. Internals assemblies and fuel modules are constructed and assembled in accordance with drawings in Chapter 1 of the applicable Safety Analysis Reports for Packaging.

5.(b) Contents

(1) Type and form of material

Spent fuel, limited to the following types, including associated activated corrosion products:

(i) S3G-3 spent fuel.

(ii) S8G spent fuel.

(iii) D1G Core 2 spent fuel.

(iv) D2W spent fuel.

(v) A1G spent fuel.

(vi) S6W spent fuel.

(vii) S9G spent fuel.

(2) Maximum quantity of material per package

Total package weight, including spent fuel and internals assembly, not to exceed 375,000 pounds; and

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

S3G-3 spent fuel modules, not to exceed 62,300 Btu/hr decay heat per package.

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

S8G spent fuel, not to exceed 51,609 Btu/hr decay heat per package (prototype spent fuel modules), or 45,713 Btu/hr decay heat per package (shipboard modules).

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

D1G-2 spent fuel with thermal limits as determined either by calculation of the wet hold time using Curve B from Figure 3-5 of the Safety Analysis Report for Packaging or by use of a shielding hold time from 8(b) below, whichever hold time is greater.

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

(iv) For contents described in 5(b)(1)(iv):

D2W spent fuel modules, not to exceed 63,000 Btu/hr decay heat per package for prototype spent fuel, 53,000 Btu/hr decay heat per package for shipboard Type 3 spent fuel modules, or 45,900 Btu/hr decay heat per package for shipboard Type 5 spent fuel modules.

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

A1G spent fuel with thermal limits as determined either by calculation of the wet hold time using Curve C from Figure 3-5 of the Safety Analysis Report for Packaging or an administrative hold time of 50 days, whichever hold time is greater.

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

S6W spent fuel modules, not to exceed 46,011 Btu/hr decay heat per package for a shipboard core or 47,160 Btu/hr for a prototype core at the time of container draining.

(vii) For contents described in 5(b)(1)(vii):

S9G spent fuel modules, not to exceed 55,002 BTU/hr decay heat per package at the time of container draining.

(c) Criticality Safety Index

Spent fuel module	Criticality Safety Index
S3G-3	100
S8G	100
D1G Core 2	100
D2W	100
A1G	0
S6W	100
S9G	0

6. For S3G-3 spent fuel shipments:

   (a) Authorized fuel loadings, internals assembly, and other loading restrictions are specified in Section 1.2 of the Safety Analysis Report for Packaging.

   (b) Minimum fuel cooling time is 130 days after shutdown.

   (c) Core age must be at least 4,000 logging corrected full power hours.

   (d) Control rod hold-down devices must be installed on cells which have control rods. Module grapple adapters serve as poison shipping rod holddown devices for refueling shipments.

7. For S8G spent fuel shipments:

   (a) Authorized fuel loadings, internals assembly, and other loading restrictions are specified in Section 1.2 of the Safety Analysis Report for Packaging.

   (b) Minimum fuel cooling time is 248 days after shutdown for prototype modules and 157 days after shutdown for shipboard modules.

   (c) Full and partial fuel modules may be shipped in any combination, but all modules must be shipped with control rods.

   (d) Control rod holddown devices must be installed on the cells. Module grapple adapters serve as control rod holddown devices.

8. For D1G Core 2 spent fuel shipments:

   (a) Authorized fuel loadings, internals assembly, and other loading restrictions are specified in Section 1.2 of the Safety Analysis Report for Packaging.

   (b) The minimum cooling time shall be the greater of 90 days for rail transport, 105 days for ship transport, or that calculated from Curve B of Figure 3-5 of the Safety Analysis Report for Packaging.

   (c) Control rod holddown devices must be installed on rodded modules. The universal grapple adapters serve as the control rod holddown devices.

9. For D2W spent fuel shipments:

   (a) Authorized fuel loadings, internals assembly, and other loading restrictions are specified in Section 1.2 of the Safety Analysis Report for Packaging.

   (b) Minimum fuel cooling time is 180 days after shutdown.

   (c) Control rod holddown devices must be installed on all rodded modules. The universal grapple adapters serve as the rod holddown devices.

10. For A1G spent fuel shipments:

    (a) Authorized fuel loadings, internals assembly, and other loading restrictions are specified in Section 1.2 of the Safety Analysis Report for Packaging.

    (b) All fuel clusters must be shipped with either control rods or poison shipping rods, with rod holddown devices installed.

    (c) Minimum fuel cooling time shall be the greater of 50 days after shutdown or that calculated using Curve C from Figure 3-5 of the Safety Analysis Report for Packaging.

11. For S6W spent fuel shipments:

    (a) Authorized fuel loadings, internals assembly, and other loading restrictions are specified in Section 1.2 of the Safety Analysis Report for Packaging.

    (b) The minimum fuel cooling time before container draining shall be 300 days after shutdown for a shipboard core or 450 days after shutdown for a prototype core.

    (c) All fuel modules must be shipped with control rods, control rod restraints, and grapple adapters installed. A lower pedestal must be installed in each module holder port.

12. For S9G spent fuel shipments:

    (a) Authorized fuel loadings, internals assembly, and other loading restrictions are specified in Section 1.2 of the Safety Analysis Report for Packaging.

    (b) The minimum fuel cooling time is 100 days.

    (c) All S9G spent fuel modules must have control rods, control rod holddown devices, and grapple adapters installed.

13. The package must contain no more than 6 gallons of residual water, except that shipments of D2W recoverable irradiated fuel may contain up to 11 gallons of residual water.

14. Failed fuel or fuel with defective cladding is not authorized for shipment.

15. Each packaging must meet the Acceptance Tests and Maintenance Program of Chapter 8 of the application, except:

    All containment seals, including the main closure head seal, must be replaced with new seals within the 12-month period prior to each shipment, or earlier if inspection shows any defect.

16. The package must be prepared for transport and operated in accordance with Chapter 7 of the application, except:

    The containment seals, excluding the main closure head seal, must pass a leak test after final closure prior to each shipment. The leak test must have a sensitivity of at least 1×10^{-3} std-cm^3/sec.

17. Prior to first use, and within the 12-month period prior to each shipment, all containment seals, including the main closure head seal, must be leak tested to show a leak rate no greater than 1×10^{-4} std-cm^3/sec. The leak test must have a sensitivity of at least 5×10^{-5} std-cm^3/sec.

18. Revision No. 11 of this certificate may be used until May 31, 2007.

19. Expiration date: October 31, 2011.

REFERENCES

"Core Independent M-140 Safety Analysis Report For Packaging," transmitted February 27, 1991.

Supplements dated: May 23, June 21, and July 17, 1991; February 4 and 7, August 17, and December 2, 1992; October 14, 1994; September 1, and November 16, 1995; May 13, August 7, September 26, and November 26, 1996; February 10, 1997; June 11, 1998; April 11, 2001; March 5 and November 27, 2002; and April 18, 2006.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

/RA/ for James R. Hall

Robert A. Nelson, Chief
Licensing Section
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

Date: May 12, 2006