

CERTIFICATE OF COMPLIANCE  
FOR RADIOACTIVE MATERIALS PACKAGES

1. a. CERTIFICATE NUMBER	b. REVISION NUMBER	c. PACKAGE IDENTIFICATION NUMBER	d. PAGE NUMBER	e. TOTAL NUMBER PAGES
9033	9	USA/9033/B(U)	1	2

2. PREAMBLE

- a. 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."
- 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)
- b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION

Amersham Corporation  
40 North Avenue  
Burlington, MA 01803

Amersham Corporation application dated  
September 24, 1993, as supplemented.

c. DOCKET NUMBER 71-9033

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.: 660, 660E, 660A, 660AE, 660B or 660BE

(2) Description

A steel encased uranium shielded Gamma Ray Projector. Primary components consist of an outer steel shell, polyurethane potting material, uranium shield, "S" tube, and end plugs. The contents are securely positioned in the "S" tube by a source cable locking device and shipping plug. Tamper-proof seals are provided on the packaging. The maximum total weight of the package is approximately 53 pounds.

(3) Drawings

The packaging is constructed in accordance with the following Technical Operations, Inc. Drawings:

- (i) Model No. 660B - Drawing No. 6602<sup>F</sup>, Sheets 1, 2 and 3, Rev. F;
- (ii) Model No. 660 - Drawing No. 66025, Sheets 1, 2, 3, and 4, Rev. B; or Drawing No. 66030, Sheets 1, 2, 3 and 4, Rev. -;
- (iii) Model No. 660A - Drawing No. 66030, Sheets 1, 2 and 3, Rev. A; or Drawing No. 66030, Sheets 1, 2, and 3, Rev. D.

Model Nos. with an E suffix have an electrical circuit.

(b) Contents

(1) Type and form of material

Iridium-192 sources which meet the requirements of special form radioactive material.

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CONDITIONS (continued)

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5. (b) Contents (continued)
  - (2) Maximum quantity of material per package
    - (i) 140 Curies for the Model No. 660B or 660BE package.
    - (ii) 120 Curies for the Model No. 660, 660E, 660A or 660AE package.
6. The source shall be secured in the shielded position of the packaging by the source assembly. The source assembly must be fabricated of materials capable of resisting a 1475 °F fire environment for one-half hour and maintaining their positioning function. The source assembly must engage the locking device. The source assembly must be of sufficient length and diameter to provide positive positioning of the source within the depleted uranium shield assembly.
7. The source assembly for use with this packaging is limited to Technical Operations, Inc. Model No. 424-9 as shown in Technical Operations, Inc. Drawing No. 42409, Rev. C.
8. The name plate must be fabricated of materials capable of resisting the fire test of 10 CFR Part 71 and maintaining its legibility.
9. In addition to the requirements of Subpart G of 10 CFR Part 71:
  - (a) The package must meet the Acceptance Test and Maintenance Program of Chapter 8.0 of the application, as supplemented; and
  - (b) The package shall be prepared for shipment in accordance with the Operating Procedures in Chapter 8.0 of the application, as supplemented.
10. The package authorized by this certificate is hereby approved for use under general license provisions of 10 CFR §71.12.
11. Expiration date: October 31, 1995.

REFERENCES

Amersham Corporation Application dated September 24, 1993.

Supplement dated: March 31, 1994.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

*Cass R. Chappell*

Cass R. Chappell, Section Leader  
Cask Certification Section  
Storage and Transport Systems Branch  
Division of Industrial and  
Medical Nuclear Safety, NMSS

JUN 15 1994

Date: \_\_\_\_\_



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

APPROVAL RECORD

Model Nos. 660, 660E, 660A, 660AE, 660B, 660BE Packages  
Certificate of Compliance No. 9033  
Revision 9

By application dated September 24, 1993, as supplemented March 31, 1993, Amersham Corporation requested an amendment to Certificate of Compliance No. 9033 for the 660 series packages.

Amersham requested that the certificate be amended to incorporate revised packaging drawings. The drawings were revised so that they would be consistent with the as-built configuration of existing packages. Changes to the drawings include: (1) addition of a supplemental lead or tungsten shield around the depleted uranium shield; (2) addition of tolerance to the package and shield weights; and (3) minor dimensional and material changes.

Amersham submitted a consolidated application which is in the format of Regulatory Guide 7.9. The consolidated application address the changes made to the drawings. The consolidated application also incorporates the pertinent information from previous submittals.

The staff reviewed the drawings and consolidated application and found them to be complete and adequate. All of the changes are minor and do not affect the structural design of the package. The addition of the supplemental shield adds only three pounds to the package weight (maximum weight of the package is approximately 53 pounds). Amersham performed 9-meter (30-foot) drop tests on a 660 prototype package containing the supplemental shield. After the drop tests, Amersham disassembled the package and found no evidence of displacement by the supplemental shield. On the basis of the results of the accident condition drop tests, Amersham concluded that the package will maintain its shielding effectiveness under the normal condition drop test. The supplemental shield, when made of lead, will melt during the fire. However, even with lead loss, the package will still meet the accident condition external dose rate limit.

The changes do not affect the package's ability meet the requirements of 10 CFR Part 71. The certificate has been amended to incorporate the revised drawings and to reference the consolidated application, as supplemented.

*Cass R. Chappell*

Cass R. Chappell, Section Leader  
Cask Certification Section  
Storage and Transport Systems Branch  
Division of Industrial and  
Medical Nuclear Safety, NMSS

JUN 15 1994

Date: \_\_\_\_\_