

United States Nuclear Regulatory Commission
Division of Fuel Cycle and Material Safety
Safety Evaluation by the Transportation Certification Branch
General Electric Company, Model No. GE-9136
Hood and Glove Box Shipping Packaging

SUMMARY

By application dated March 31, 1980, as amended, General Electric Company requested approval to deliver up to 30 hoods and glove boxes containing low-level solid radioactive material to a carrier for transport in the Model No. GE-9136 packaging. Based on the statements and representations as contained in the submittals, we have concluded that the package meets the requirements of 10 CFR Part 71 subject to the exemption and conditions stated below.

SUBMITTALS

1. Application dated March 31, 1980.
2. Supplement dated April 28, 1980.
3. Supplement dated June 11, 1980.

DRAWINGS

General Electric Company Drawing Nos. 908E615, Revision No. 2, and 908E617, Revision No. 1.

PACKAGE DESCRIPTION

The packaging consists of a right rectangular box 120.5" wide x 86" high x 65.75" deep constructed of 3/4" 5-ply ACX external plywood over 2" x 4" wooden framework on a plywood covered 2" x 12" wooden plank base and fitted with 4" x 4" interior beam and column supports and external skids. The closure is of the same construction and all parts are secured by means of bolts, screw nails and weather resistant adhesive.

The contents of the package (glove box or hood) are restrained in the outer packaging (box) with four 1/4" stranded type wire ropes that cross over the glove box or hood and are secured to 1/2" steel eye bolts that penetrate the floor of the box. The wire rope is tightened with 1/2" steel turnbuckles. The eye bolts are secured to the underside of the floor through 1/2" thick by 4" x 4" steel plates. The holes in the floor for eye bolts are slightly undersized to provide a tight fit and the holes are filled with RTV (silicon rubber mastic) before eye bolts are inserted to maintain packaging integrity. Additional cribbing may be cut to fit and applied to the packaging provided the maximum gross weight of 3,700 pounds is not exceeded.

PACKAGE CONTENTS

Radioactive constituents are plutonium and uranium, fixed on the interior surfaces of the glove box or hood. The maximum radioactivity is $\leq 2 \mu \text{ ci/cm}^2$ averaged over 1 m^2 . The interior surface area of the largest glove box is approximately 20 square meters.

All radioactive contents are <1 gram fissile.

GENERAL REQUIREMENTS FOR ALL PACKAGINGS

Packaging materials of construction produce no chemical, galvanic or other reaction between packaging components or components and packaging contents.

Packaging closure is effected by gluing, nailing, and bolting the package lid to the package body. The completed package is covered with a Fiberglas coating and the package cannot be inadvertently opened.

There are no lifting devices.

There are no tie-down devices.

NORMAL CONDITIONS OF TRANSPORT

Heat

The outer container is constructed of wood and either painted or coated with Fiberglas. There are no materials on which the structure depends that would be adversely affected by prolonged temperatures up to 130°F .

Cold

Similarly, the wooden container is unaffected by extremely cold temperature.

Pressure

Since the size and weight of the package precludes consideration of air transport, the package is not likely to encounter pressures lower than about 0.8 of an atmosphere. Nevertheless, both the contents and the outer wooden container will allow enough slow diffusion of air molecules to preclude any possibility of a sudden rupture of a seam or joint.

Vibration

The contents are of welded steel and therefore unaffected by vibration. The six faces of the outer wooden box are jointed with screw nails, bolts and glue providing structural strength superior to crates used commonly for transport of heavy motors and industrial machinery.

Water Spray

The water spray resulted in no visible signs of distortion nor other adverse effects.

Free Drop

One package corner (top) was drop tested four (4) feet onto an essentially unyielding surface. This corner was considered to be the area where the maximum impact damage would occur.

Upon impact, the packaging sustained relative minor damage at the corner of impact and no opening in any part of the entire structure could be found by visual inspection.

Penetration Test

No affect on packaging.

Compression Test

A structural analysis was performed to demonstrate that stresses on the beams, columns, and plywood face are well within the allowable unit stress on the wood (Douglas Fir).

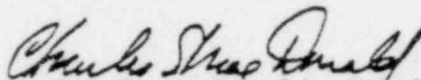
CONTAINMENT AND HYPOTHETICAL ACCIDENT CONDITIONS

General Electric Company has requested that its package Model No. GE-9136 be exempted from the Hypothetical Accident Conditions of Transport specified in §71.36 of 10 CFR Part 71. Presently the Commission has outstanding a proposed rule, which was published in the Federal Register on August 17, 1979 (44 FR 48234-48257), would revise NRC regulations to make them more consistent with the International Atomic Energy Agency's (IAEA) "Regulations for the Safe Transport of Radioactive Materials," Safety Series No. 6 (1973 Revised Edition). The IAEA safe transport regulations are generally acknowledged to reflect the most current advances in the state-of-the-art with regard to acceptable methods for the safe transportation of radioactive materials.

Under the NRC's proposed regulations, the radioactive material which General Electric proposes to deliver to a carrier for transport would be classified as low level solid radioactive material (LLS), a new category defined in proposed §71.4(g)(2), and as such its packaging would not have to meet the Hypothetical Accident Conditions of Transport (see proposed §71.8). Based upon the same considerations underlying the proposed rule, the Commission has determined that granting General Electric Company an exemption from 10 CFR §71.36 for its Model No. GE-9136 package is authorized by law and will

not endanger life or property or the common defense and security provided that this exemption (granted pursuant to 10 CFR §71.6) is subject to the following qualifications:

1. Package Contents: Low-Level solid radioactive material as defined in Section 71.4(g)(2) of the proposed revision to 10 CFR Part 71 dated August 17, 1979 (44 FR 48234 - 48257).
2. The hoods and glove boxes shall be of such size as not to fit into other approved packaging (with legs or other readily removable appendixes removed).
3. Package Model No. GE-9136 is exempt from the requirements of 10 CFR §71.36 for the purpose of making these shipments.
4. The package authorized shall be transported on a motor vehicle assigned for the sole use of the licensee.
5. Expiration date: June 30, 1981.


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Division of Fuel Cycle and
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Date: JUL 02 1980