



DEPARTMENT OF TRANSPORTATION
HAZARDOUS MATERIALS REGULATIONS BOARD
WASHINGTON, D.C. 20590

17969

[Docket No. HM-98; Amdt. No. 173-66]

PART 173—SHIPPERS

Radioactive Materials; Preparation of Packages for Shipment

The purpose of this amendment to the Department's Hazardous Materials Regulations is to improve the requirements for preshipment preparation of radioactive materials packages by prescribing certain examinations and test procedures.

On March 17, 1972, the Hazardous Materials Regulations Board published Docket HM-98; Notice 72-2 (37 F.R. 5641) proposing certain additions to §§ 173.389 and 173.393 of the Hazardous Materials Regulations. Interested persons were given an opportunity to comment on the proposed changes.

Numerous comments were received from persons representing shippers, carriers, labor unions, medical isotope users, and military. The great majority of comments were in favor of the amendment, although several changes were recommended. On the basis of these suggestions, the Board has made several changes in this amendment.

The introductory language of § 173.393 (m) has been clarified to more appropriately reflect and emphasize the quality control and administrative procedural requirements which follow.

A significant number of commenters, including the Atomic Industrial Forum and the Atomic Energy Commission, recommended that for air shipment § 173.393(n) require a special preshipment leakage test on each package containing liquid radioactive material exceeding a Type A quantity. Such a test provides confirmation of the existing performance requirement in § 173.398(b) (2) (iii). In view of these comments and the circumstances peculiar to air transportation, particularly those involving a package containing a greater quantity of radioactive material, the Board has changed § 173.393(n) to require this preshipment leak test. The Board has provided that the test may be conducted either on the entire containment system as a unit, or on any receptacle or vessel within the containment system.

Several comments were received from manufacturers of irradiated fuel casks regarding an inconsistency between the definition of "maximum normal operating pressure" (MNOP) in § 173.389(n) and its use in § 173.393(n) (8). The inconsistency involved the 1-year period specified for pressure buildup in the MNOP definition when compared to the proposed requirement that the internal pressure of the containment system must not exceed the MNOP during the "anticipated period of transport." Commenters stated that § 173.389(n) does not recognize the possibility of the MNOP being below atmospheric. Also, some commenters considered the word "normal" in the MNOP definition inappropriate since it ignores the provisions which

might be made for venting or for ancillary cooling systems. The Board acknowledges these difficulties presented by the proposal.

The MNOP definition was taken from the draft of proposed changes to the International Atomic Energy Agency Regulations (IAEA) which are now expected to be published late in 1972. The IAEA definition of MNOP sets forth the maximum pressure that could develop under credible conditions of transportation. It assumes such things as malfunction of a pressure relief device, misplacement of a package for as long as 1 year, and lack of provision for external mechanical cooling or administrative shipment controls. It establishes an idealized design benchmark. However, within the context of the IAEA Regulations, it will be qualified by several technical requirements not presently in the Hazardous Materials Regulations. These will relate to the criteria for international competent authority certifications of package design in contrast to the "unilateral" or "multilateral" approval concepts.

The Board acknowledges that in the development of § 173.393(n) (8), it did not consider the fact that in many package designs, the MNOP would never be reached because of pressure relief devices, external cooling systems, etc. Further, for domestic transport purposes, the period of transport of large irradiated fuel packages is not likely to exceed 2 months. For these reasons, it is neither necessary nor appropriate to require that the containment system be designed to meet the MNOP definition.

Therefore, § 173.393(n) (8) is modified to require that for any package likely to develop a significant internal pressure, such pressure may not exceed the "design pressure" at any time during transportation.

One commenter suggested modifying the requirement in § 173.393(n) (2) that packagings be in "unimpaired physical condition." He stated that this rule could be interpreted in an unnecessarily restrictive manner and preclude repeated shipments of containers which have only superficial damage such as scratches or surface oxidation. The Board does not agree with this comment. However, it recognizes that a certain amount of judgment is involved to determine if a package is impaired relative to safety in transportation.

The source of the values in § 173.393(a) (7) concerning pressure differential and any future contemplated changes are of particular interest to some persons according to comments the Board has received in this docket and other dockets relating to other classes of hazardous materials. The value of 0.5 atmosphere (absolute) (7.3 p.s.i. or 0.5 kg/cm²) in § 173.393(a) (7) is based on the existing performance criteria in § 173.398(b) (2) (iii). That value is also consistent with existing IAEA and IATA Regulations. However, it is foreseen that, with the expected revisions to the IAEA

Regulations later in 1972 and subsequent revisions to the IATA Regulations in 1973, this value may be changed to 0.25 atmospheric absolute (3.56 p.s.i. or 0.25 kg./cm²). Therefore, the Board advises that it may propose such a change at some future date, together with other changes, to make the Hazardous Materials Regulations as compatible as possible with international standards.

In consideration of the foregoing, 49 CFR Part 173 is amended to read as follows:

A. In § 173.389, paragraphs (m) and (n) are added to read as follows:

§ 173.389 Radioactive materials; definitions.

* * * * *
(m) *Containment system.* Containment system of a radioactive materials package means those components of the packaging including special form encapsulation where used, which have been specified by the package designer as intended to retain the radioactive contents during transport, whether or not individual vessels in the packaging retain their integrity of containment.

(n) *Maximum normal operating pressure.* Maximum normal operating pressure means the maximum pressure above atmospheric pressure at mean sea level that would develop in the containment system in a period of 1 year, under the conditions of temperature and solar radiation corresponding to environmental conditions of transport in the absence of venting, external cooling by an ancillary system, or operational controls during transport.

B. In § 173.393, paragraphs (m) and (n) are added to read as follows:

§ 173.393 General packaging requirements.

* * * * *
(m) Prior to the first shipment of any package, the shipper shall determine by examination or appropriate test that:

(1) The packaging meets the specified quality of design and construction; and

(2) The effectiveness of the shielding and containment, and, where necessary, the heat transfer characteristics of the package are within the limits applicable to or specified for the package design.

(n) Prior to each shipment of any package, the shipper shall insure by examination or appropriate test that:

(1) The package is proper for the contents to be shipped;

(2) The packaging is in unimpaired physical condition except for superficial marks;

(3) Each closure device of the packaging, including any required gasket, is properly installed and secured and free of defects;

(4) For a fissile material, and moderator and neutron absorber, if required, is present in proper condition;

(5) Any special instructions for filling, closing, and preparation of the package for shipment have been followed;

(6) Each closure, valve, and any other opening of the containment system through which the radioactive content might escape is properly closed and sealed;

(7) Each package containing liquid in excess of a Type A quantity and destined for air shipment is tested to demonstrate that it is leak tight under an ambient atmospheric pressure differential of at least 0.5 atmosphere (absolute) (7.3 p.s.i.a. or 0.5 kg./cm²); the test may be conducted on the entire containment system or on any receptacle or vessel within the containment system, as appropriate to determine compliance with the requirement;

(8) If the maximum normal operating pressure of a package is likely to exceed 0.35 kg./cm² (gage), the internal pressure of the containment system will not exceed the design pressure during transportation; and

(9) External radiation and contamination levels are within the allowable limits.

This amendment is effective December 30, 1972. However, compliance with the regulations, as amended herein, is authorized immediately.

(Secs. 831-835, title 18, U.S.C.; sec. 9, Department of Transportation Act, 49 U.S.C. 1657; title VI, sec. 902(h), Federal Aviation Act of 1958, 49 U.S.C. 1421-1230 and 1472(h))

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W. F. REA III, *RADM,*
Board Member, for the
U.S. Coast Guard.

MAC E. ROGERS,
Board Member, for the
Federal Railroad Administration.

ROBERT A. KAYE,
For the Federal
Highway Administration.

JAMES F. RUDOLPH,
Board Member, for the Federal
Aviation Administration.

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