



REGULATORY GUIDE

OFFICE OF NUCLEAR REGULATORY RESEARCH

REGULATORY GUIDE 7.4

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LEAKAGE TESTS ON PACKAGES FOR SHIPMENT OF RADIOACTIVE MATERIAL

A. INTRODUCTION

This guide describes an approach that the staff of the U.S. Nuclear Regulatory Commission (NRC) considers acceptable for meeting the containment criteria for Type B packages in Title 10, Section 71.51, “Additional Requirements for Type B Packages,” of the *Code of Federal Regulations* (10 CFR 71.51) (Ref. 1). The regulations at 10 CFR 71.51 require licensees to ensure that Type B packages, following tests for normal conditions of transport and hypothetical accident conditions, meet the containment criteria to minimize radioactive contamination and dose rates to the public. The NRC staff developed and published this guidance to help applicants and licensees meet these objectives, ensure package integrity, and minimize the distribution of contamination to the environment.

This regulatory guide endorses the methods and procedures developed by the Standards Committee on Packaging and Transportation of Radioactive and Nonnuclear Hazardous Materials, N14, Subcommittee of the American National Standards Institute (ANSI) in ANSI N14.5-1997, “Radioactive Materials - Leakage Tests on Packages for Shipment,” issued 1997 and reaffirmed in 2008 (Ref. 2), as a process that the NRC staff considers acceptable for meeting the regulatory requirements.

This regulatory guide contains information collection requirements covered by 10 CFR Part 71 that the Office of Management and Budget (OMB) approved under OMB control number 3150-0008. The NRC may neither conduct nor sponsor, and a person is not required to respond to, an information collection request or requirement unless the requesting document displays a currently valid OMB control number. Additionally, this regulatory guide is a rule as designated in the Congressional Review Act (5 U.S.C. 801–808). However, OMB has not found it to be a major rule as designated in the Congressional Review Act.

The NRC issues regulatory guides to describe and make available to the public methods that the NRC staff considers acceptable for use in implementing specific parts of the agency’s regulations, techniques that the staff uses in evaluating specific problems or postulated accidents, and data that the staff needs in reviewing applications for permits and licenses. Regulatory guides are not substitutes for regulations, and compliance with them is not required. Methods and solutions that differ from those set forth in regulatory guides will be deemed acceptable if they provide a basis for the findings required for the issuance or continuance of a permit or license by the Commission.

This guide was issued after consideration of comments received from the public.

Regulatory guides are issued in 10 broad divisions—1, Power Reactors; 2, Research and Test Reactors; 3, Fuels and Materials Facilities; 4, Environmental and Siting; 5, Materials and Plant Protection; 6, Products; 7, Transportation; 8, Occupational Health; 9, Antitrust and Financial Review; and 10, General.

Electronic copies of this guide and other recently issued guides are available through the NRC’s public Web site under the Regulatory Guides document collection of the NRC Library at <http://www.nrc.gov/reading-rm/doc-collections/> and through the NRC’s Agencywide Documents Access and Management System (ADAMS) at <http://www.nrc.gov/reading-rm/adams.html>. This guide may be found in ADAMS under Accession No. ML120600157. The regulatory analysis may be found in ADAMS under Accession No. ML112520027. This guide was issued after consideration of comments received from the public. Public comments and the NRC response to them may be found in ADAMS under Accession No. ML112520028.

B. DISCUSSION

The regulations at 10 CFR Part 71, “Packaging and Transportation of Radioactive Material,” establish the requirements for the packaging, preparation for shipment, and transportation of licensed material in such a manner that the total dose to an individual (including doses resulting from licensed and unlicensed radioactive material and from radiation sources other than background radiation) does not exceed the standards for protection against radiation prescribed in 10 CFR Part 20, “Standards for Protection against Radiation” (Ref. 3). The regulations in 10 CFR Part 71 describe package release limits, methods for relating package release limits to allowable and reference leakage rates, and minimum requirements for leakage rate test procedures. The regulations in 10 CFR Part 71 also provide requirements for the design, fabrication, maintenance, periodic testing, and preshipment leakage rate tests of packages that contain radioactive material.

Background

Regulatory Guide 7.4 was originally published in June 1975 to endorse the guidance in the ANSI N14.5-1973 as an acceptable method for complying with the then current version of 10 CFR Part 71. Since that time the NRC has revised 10 CFR Part 71 a number of times and the ANSI N14.5 standard has been revised twice with no change to the regulatory guide. This revision of regulatory guide 7.4 endorses ANSI N14.5-1997 which was reaffirmed in 2008 and is the current active version of the ANSI standard.

Other Codes and Standards

This regulatory guide endorses the use of one or more voluntary consensus codes or standards developed by external organizations. These codes or standards may contain references to other codes or standards. These references should be considered individually. If a referenced standard has been incorporated separately into NRC regulations, licensees and applicants must comply with that standard as set forth in the regulation. If the referenced standard has been endorsed in a regulatory guide, the standard constitutes a method acceptable to the NRC staff for meeting a regulatory requirement as described in the specific regulatory guide. If a referenced standard has been neither incorporated into NRC regulations nor endorsed in a regulatory guide, licensees and applicants may consider and use the information in the referenced standard and the NRC staff may accept the method if it is appropriately justified and consistent with current regulatory practice.

Harmonization with International Standards

The International Atomic Energy Agency (IAEA) has established a series of safety guides and standards constituting a high level of safety for protecting people and the environment. IAEA safety guides are international standards to help users striving to achieve high levels of safety. Pertinent to this regulatory guide, IAEA Safety Guide TS-G-1.1 (ST-2), “Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material,” dated June 2002 (Ref. 4) and IAEA Regulation TS-R-1 (ST1 Revised 1996), “Regulations for the Safe Transport of Radioactive Material,” dated June 2000 (Ref. 5) incorporate many of the practices described in ANSI N14.5-1997 which is endorsed by this regulatory guide.

C. STAFF REGULATORY GUIDANCE

This regulatory guide endorses the methods described in the American National Standards Institute (ANSI) Standard ANSI N14.5-1997, "Radioactive Materials-Leakage Tests on Packages for shipment." The NRC staff has determined that the methods described in ANSI N14.5-1997 constitute procedures generally acceptable to the NRC staff for assessing the containment properties of packages for the shipment of radioactive material and compliance with the procedures satisfies the Type B package requirements of 10 CFR Part 71.51.

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants and licensees regarding the NRC's plans for using this regulatory guide. The NRC does not intend or approve any imposition or backfit in connection with its issuance.

In some cases, applicants or licensees may propose or use a previously established acceptable alternative method for complying with specified portions of the NRC's regulations. Otherwise, the methods described in this guide will be used in evaluating compliance with the applicable regulations for license applications and amendment requests.

If a licensee believes that the NRC is either using this regulatory guide or requesting or requiring the licensee to implement the methods or processes in this regulatory guide in a manner inconsistent with the discussion in this Implementation section, then the licensee may file a backfit appeal with the NRC in accordance with the guidance in NUREG-1409 and NRC Management Directive 8.4.

REFERENCES¹

1. 10 CFR Part 71, “Packaging and Transportation of Radioactive Material,” U.S. Nuclear Regulatory Commission, Washington, DC.
2. ANSI N14.5-1997, “Radioactive Materials - Leakage Tests on Packages for Shipment,” American National Standards Institute, New York, NY, 1997.²
3. 10 CFR Part 20, “Standards for Protection against Radiation,” U.S. Nuclear Regulatory Commission, Washington, DC.
4. IAEA Safety Guide TS-G-1.1 (ST-2), “Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material,” dated June 2002, International Atomic Energy Agency (IAEA), Vienna, Austria.³
5. IAEA Regulation TS-R-1 (ST1 Revised 1996), “Regulations for the Safe Transport of Radioactive Material,” dated June 2000, International Atomic Energy Agency (IAEA), Vienna, Austria.

¹ All publicly available NRC documents are available electronically through the NRC Library on the NRC’s public Web site at: <http://www.nrc.gov/reading-rm/doc-collections/>. The documents can also be viewed on-line for free or printed for a fee in the NRC’s Public Document Room (PDR) at 11555 Rockville Pike, Rockville, MD; the mailing address is USNRC PDR, Washington, DC 20555; telephone (301) 415-4737 or (800) 397-4209; fax (301) 415 3548; and e mail pdr.resource@nrc.gov.

² Copies of American National Standards Institute (ANSI) standards may be purchased from ANSI, 1819 L Street, NW, Washington, DC 20036, on their Web site at <http://webstore.ansi.org/>; telephone (202) 293-8020; fax (202) 293-9287; or e-mail storemanager@ansi.org.

³ Copies of International Atomic Energy Agency (IAEA) documents may be obtained through their Web site: WWW.IAEA.Org/ or by writing the International Atomic Energy Agency P.O. Box 100 Wagramer Strasse 5, A-1400 Vienna, Austria. Telephone (+431) 2600-0, Fax (+431) 2600-7, or E-Mail at Official.Mail@IAEA.Org.