American Nuclear Society

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shipment and receipt of special nuclear material (SNM) by research reactor facilities

an American National Standard

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American National Standard for Shipment and Receipt of Special Nuclear Material (SNM) by Research Reactor Facilities

Secretariat
American Nuclear Society

Prepared by the
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Standards Committee
Working Group ANS-15.19

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American National Standard

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Foreword

(This Foreword is not a part of the American National Standard for Shipment and Receipt of Special Nuclear Material (SNM) by Research Reactor Facilities, ANSI/ANS-15.19-1991.)

An increase in the shipment and receipt of special nuclear material (SNM) by the research reactor community was anticipated because of the 1982 U.S. Nuclear Regulatory Commission (NRC) Policy Statement, "Use of High-Enriched Uranium (HEU) in Research Reactors." Working Group ANS-15.19 was established in 1985 to prepare a standard that provided guidance and information for shipping, receiving, and storing of fuel and other fabricated SNM for research reactors. The final rule, Title 10, "Energy," Code of Federal Regulations, Part 50, "Licensing of Production and Utilization Facilities," Section 64, "Limitations on the Use of Highly Enriched Uranium (HEU) in Domestic Non-Power Reactors," was promulgated in 1986.

The activities associated with the shipment, receipt, and storage of SNM are regulated. Personnel at many research reactors seldom are involved in such activities. This standard provides guidance and requirements for meeting the requirements and implementing the procedures that are prescribed in the regulations. It identifies the federal regulations that must be complied with and the supporting NRC NUREG documents. This standard addresses the requirements of the federal regulations that were in effect at the time it was published. Since these regulations are subject to change, users are cautioned to review the sections of the standard for rule changes since its date of publication.

This standard was developed by the following ANS-15.19 Working Group members:

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Consensus Committee N17, Research Reactors, Reactor Physics, and Radiation Shielding, had the following membership at the time it reviewed and approved this standard:

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Contents

Shipment and Receipt of Special Nuclear Material (SNM) by Research Reactor Facilities

1. Scope

This standard provides the necessary information for the shipping, receiving, and storing of fuel and other fabricated special nuclear material for research reactors. The areas addressed are data collection and analysis, packaging selection, preparation of the package or shipment, or both, safeguards, internal material control, records, and quality assurance for shipping.

2. Purpose

This standard provides guidance to implement the U.S. Nuclear Regulatory Commission (NRC) and U.S. Department of Transportation (DOT) regulations and requirements for the receipt, control, and shipment of both unirradiated and irradiated fabricated special nuclear material (SNM). The principal forms of fabricated SNM addressed are fuel elements, fission chambers, and fission plates, which are typical of the fabricated SNM used in the operation of research reactors and their experimental facilities. The guidance in this standard is primarily directed at SNM associated with the operation of a research reactor. However, the guidance can be applied to other fabricated forms that fall within the definition of SNM used in this standard.

> **NOTE:** Generic sources of regulations and requirements associated with these activities, as well as standards and guidance documents, are identified in some sections of this standard. In other sections, such documents are implicit. The user of this standard should be aware that no titles or reference numbers appear in the text. Section 10, Applicable Regulations, Standards, and Guidance Documents, provides the numerical designations and titles. Specific paragraphs of the regulatory documents that are pertinent are listed.

3. Definitions

The following definitions will assist in the application of this standard.

A_1 or A_2. A_1: The maximum activity of special form radioactive material permitted in a Type A package. A_2: The maximum activity of radioactive material, other than special form or low specific activity radioactive material, permitted in a Type A package. These A_1 and A_2 values are either listed in the table of A_1 and A_2 Values for Radionuclides or may be derived in accordance with the procedure prescribed in 49 CFR 173.

contamination.
(1) Nonfixed (removable) contamination: radioactive contamination that can be readily removed from a surface by wiping with an absorbent material.
(2) Fixed contamination: contamination other than nonfixed contamination; i.e., contamination that cannot be readily removed from a surface by wiping with an absorbent material.

conveyance.
(1) For transport by public highway or rail: any transport vehicle or large freight container.
(2) For transport by vessel: any vessel, or any hold, compartment, or defined deck area of a vessel.
(3) For transport by aircraft: any aircraft.

design. The description of a special form of radioactive material, a package, or a packaging that enables those items to be fully identified. The description may include specifications, engineering drawings, reports showing compliance with regulatory requirements, and other relevant documentation.

exclusive use. The sole use of a conveyance by a single consignor and for which all initial, intermediate, and final loading and unloading are carried out in accordance with the direction of the consignor or consignee. (Also referred to as "sole use" or "full load.")

fissile material. Any material consisting of or containing one or more fissile radionuclides. Fissile radionuclides are ^{238}Pu, ^{239}Pu, ^{241}Pu, ^{233}U, and ^{235}U. Neither natural nor depleted uranium are fissile material.

formula quantity. Strategic special nuclear material in any combination in a quantity of