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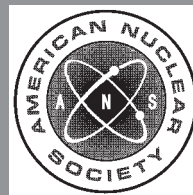
ANSI/ANS-15.1-2007 (R2013)

**the development of technical
specifications for research reactors**

an American National Standard

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This standard does not necessarily reflect recent industry initiatives for risk informed decision-making or a graded approach to quality assurance. Users should consider the use of these industry initiatives in the application of this standard.



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ANSI/ANS-15.1-2007

**American National Standard
The Development of Technical
Specifications for Research Reactors**

Secretariat
American Nuclear Society

Prepared by the
**American Nuclear Society
Standards Committee
Working Group ANS-15.1**

Published by the
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555 North Kensington Avenue
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Approved April 20, 2007
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American National Standards Institute, Inc.

American National Standard

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Comments on this standard are encouraged and should be sent to Society Headquarters.

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Foreword (This Foreword is not a part of American National Standard “The Development of Technical Specifications for Research Reactors,” ANSI/ANS-15.1-2007.)

ANS-15.1, “The Development of Technical Specifications for Research Reactors,” is the principal standard developed under the direction of Subcommittee ANS-15, Operation of Research Reactors. This standard impacts research reactors of every type and size and has been widely used by most of them. Certain segments of this standard may be useful to critical experiment facilities and fast pulse reactors; however, these facilities should continue to use American National Standard ANSI/ANS-1-2000, “Conduct of Critical Experiments,” and ANSI/ANS-14.1-2004, “Operation of Fast Pulse Reactors.”

This standard uses the word “significant” throughout. This word must be defined on a case-by-case basis for each user of the standard based on that user’s specific facility and Safety Analysis Report.

The membership of the ANS-15.1 working group at the time of the revision of the standard was as follows:

A. Adams, Jr. (Cochair), *U.S. Nuclear Regulatory Commission*
T. R. Schmidt (Cochair), *Sandia National Laboratories*

T. M. Raby, *National Institute of Standards and Technology*
W. J. Richards, *National Institute of Standards and Technology*

In the process of creating this standard with respect to existing and varied practices in many operating facilities, it is important to consider the following:

- (1) It is not intended that the standard be used as a demand model for backfitting purposes;
- (2) Its provisions should be used only to the extent applicable to the individual facility;
- (3) It should be a significant aid for an existing and new owner or operator, or both;
- (4) It should be helpful for the facility undergoing change or modification, or both;
- (5) Its considered use should assist in implementing regulatory requirements.

This standard addresses itself to technical specifications for and administrative control of research and test reactors. However, Sec. 6, “Administrative Controls,” in this standard includes a review and audit section that effectively provides for the function of operational quality assurance at research reactors. Additional standards have been prepared addressing other areas of interest and concern to operators of research reactors. Guidance may be found in the following supplementary American National Standards developed for research reactors:

ANSI/ANS-15.2-1999, “Quality Control for Plate-Type Uranium-Aluminum Fuel Elements”

ANSI/ANS-15.4-1988 (R1999), “Selection and Training of Personnel for Research Reactors”

ANSI/ANS-15.7-1977; R1986 (W1996), “Research Reactor Site Evaluation” (withdrawn)

ANSI/ANS-15.8-1995 (R2005), “Quality Assurance Program Requirements for Research Reactors”

ANSI/ANS-15.10-1994 (W2004), "Decommissioning of Research Reactors"
(withdrawn)

ANSI/ANS-15.11-1993 (R2004), "Radiation Protection at Research Reactor
Facilities"

ANSI/ANS-15.15-1978; R1986 (W1996), "Criteria for the Reactor Safety Systems
of Research Reactors" (withdrawn)

ANSI/ANS-15.16-1982; R1988; R2000, "Emergency Planning for Research Reactors"

ANSI/ANS-15.17-1981; R1987; R2000, "Fire Protection Program Criteria for
Research Reactors"

ANSI/ANS-15.19-1991 (W2001), "Shipment and Receipt of Special Nuclear Ma-
terial (SNM) by Research Reactor Facilities" (withdrawn)

ANSI/ANS-15.20-200x, "Criteria for the Reactor Control of Safety Systems of
Research Reactors" (under development)

ANSI/ANS-15.21-1996; R2006, "Format and Content for Safety Analysis Reports
for Research Reactors"

The membership of Subcommittee ANS-15 at the time of the standard revision
was as follows:

W. J. Richards (Chair), *National Institute of Standards and Technology*

A. Adams, Jr., *U.S. Nuclear Regulatory Commission*
L. M. Bobek, *University of Massachusetts, Lowell*
J. W. Bryson, *Sandia National Laboratories*
C. D. Cooper, *Bechtel BWXT*
M. L. Gildner, *Oak Ridge National Laboratory*
M. Krause, *University of Texas*
P. M. Madden, *U.S. Nuclear Regulatory Commission*
C. McKibben, *University of Missouri-Columbia*
S. Miller, *Armed Forces Radiobiology Research Institute*
T. J. Myers, *National Institute of Standards and Technology*
R. Nelson, *Research Reactor Safety Analysis Services*
D. S. O'Kelly, *University of Texas*
P. B. Perez, *Entergy Nuclear Vermont*
T. M. Raby, *National Institute of Standards and Technology*
T. R. Schmidt, *Sandia National Laboratories*
C. F. Sears, *The Pennsylvania State University*

Consensus Committee N17, Research Reactors, Reactor Physics, Radiation Shield-
ing, and Computational Methods, had the following membership at the time it
reviewed and approved this standard;

T. M. Raby (Chair), *National Institute of Standards and Technology*

A. Weitzberg (Vice Chair) *Individual*

W. H. Bell, *American Institute of Chemical Engineers*
(Alt. R. D. Zimmerman, *American Institute of Chemical Engineers*)
R. E. Carter, *Individual*
D. M. Cokinos, *Brookhaven National Laboratory*
B. Dodd, *Health Physics Society*
B. K. Grimes, *Individual*
N. E. Hertel, *Georgia Institute of Technology*
W. A. Holt, *American Public Health Association*
W. C. Hopkins, *Individual*
M. A. Hutmaker, Jr., *U.S. Department of Energy*
L. I. Kopp, *Individual*
P. M. Madden, *U.S. Nuclear Regulatory Commission*
(Alt. A. Adams, Jr., *U.S. Nuclear Regulatory Commission*)
J. F. Miller, *Institute of Electrical and Electronics Engineers*
J. E. Olhoeft, *Individual*
W. J. Richards, *National Institute of Standards and Technology*

T. R. Schmidt, *Sandia National Laboratories*
A. O. Smetana, *Savannah River National Laboratory*
R. Tsukimura, *Aerotest Operations*
S. H. Weiss, *National Institute of Standards and Technology*
(Alt. T. J. Myers, *National Institute of Standards and Technology*)
A. R. Veca, *General Atomics*

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This is a preview of "ANSI/ANS-15.1-2007 (...". [Click here](#) to purchase the full version from the ANSI store.

The Development of Technical Specifications for Research Reactors

1 Introduction

1.1 Scope

This standard identifies and establishes the content of technical specifications (TS) for research and test reactors. Areas addressed are definitions, safety limits, limiting safety system settings, limiting conditions for operation, surveillance requirements, design features, and administrative controls. Sufficient detail is incorporated so that applicable specifications can be derived or extracted.

1.2 Application

1.2.1 Purpose

It is recognized that because of the special nature and wide range of research reactors, no general standard can be applied without thoughtful interpretation and that not all requirements are applicable to every facility. Accordingly, incorporation of various requirements of this standard into technical specifications may range from detailed application to unqualified inapplicability. Technical specifications may also be referred to as technical safety requirements (TSR).

The technical specifications represent an agreement between the owner or operator, or both, and the responsible authority on administrative controls, equipment availability, and operational parameters.

Specific limitations and equipment requirements for safe reactor operation and for dealing with abnormal situations, typically derived from the Safety Analysis Report (SAR), are called specifications. These specifications represent a comprehensive envelope of safe operation. Only those operational parameters and equipment requirements directly related to verifying and preserving that safe envelope shall be listed. Procedures to meet the requirements of these technical specifications shall not be part of the technical specifications.

1.2.2 Format

In order to ensure that all items that may be relevant for inclusion in the technical specifications have been considered, the requirements of this standard include the heading and numbering format of major sections ("1 Introduction," "2 Safety limits and limiting safety system settings," "3 Limiting conditions for operation," "4 Surveillance requirements," "5 Design features," and "6 Administrative controls") and the first level of subheadings (2.x, 3.x, etc.). Beginning with Sec. 2, each heading and the first level of subheading shall be addressed if applicable. All headings and numbering at the next level and beyond (2.x.x, 3.x.x, etc.) shall be addressed if applicable, altered as necessary, or omitted if not applicable.

Individual specifications in Secs. 2, 3, and 4 shall include the following related information in the format shown:

Applicability: This is a statement that indicates which components are involved and when they are involved;

Objective: This is a statement that indicates the purpose of the specification(s);

Specification(s): This statement provides specific data, conditions, or limitations that bound a system or operation. This statement is the most important statement in the technical specifications agreement;

Basis: The basis is a statement that provides the background or reason for the choice of specification(s), or references a particular portion of the Safety Analysis Report that does.

Although each of the preceding statements provides important information, only the "Specification(s)" and "Applicability" statements govern. Section 5, "Design features," and Sec. 6, "Administrative controls," should state the specifications without the related information. Section 1, "Introduction," may include definitions that would clarify the usage of terms.