

American Nuclear Society

WITHDRAWN

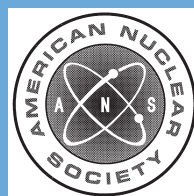
April 19, 2016

ANSI/ANS-15.4-2007 (W2016)

**selection and training of
personnel for research reactors**

an American National Standard

No longer being maintained as an American National Standard. This standard may contain outdated material or may have been superseded by another standard. Please contact the ANS Standards Administrator for details.



published by the
American Nuclear Society
555 North Kensington Avenue
La Grange Park, Illinois 60526 USA

ANSI/ANS-15.4-2007

**American National Standard
Selection and Training
of Personnel for
Research Reactors**

Secretariat
American Nuclear Society

Prepared by the
**American Nuclear Society
Standards Committee
Working Group ANS-15.4**

Published by the
**American Nuclear Society
555 North Kensington Avenue
La Grange Park, Illinois 60526 USA**

Approved August 17, 2007
by the
American National Standards Institute, Inc.

American National Standard

Designation of this document as an American National Standard attests that the principles of openness and due process have been followed in the approval procedure and that a consensus of those directly and materially affected by the standard has been achieved.

This standard was developed under procedures of the Standards Committee of the American Nuclear Society; these procedures are accredited by the American National Standards Institute, Inc., as meeting the criteria for American National Standards. The consensus committee that approved the standard was balanced to ensure that competent, concerned, and varied interests have had an opportunity to participate.

An American National Standard is intended to aid industry, consumers, governmental agencies, and general interest groups. Its use is entirely voluntary. The existence of an American National Standard, in and of itself, does not preclude anyone from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standard.

By publication of this standard, the American Nuclear Society does not insure anyone utilizing the standard against liability allegedly arising from or after its use. The content of this standard reflects acceptable practice at the time of its approval and publication. Changes, if any, occurring through developments in the state of the art, may be considered at the time that the standard is subjected to periodic review. It may be reaffirmed, revised, or withdrawn at any time in accordance with established procedures. Users of this standard are cautioned to determine the validity of copies in their possession and to establish that they are of the latest issue.

The American Nuclear Society accepts no responsibility for interpretations of this standard made by any individual or by any ad hoc group of individuals. Requests for interpretation should be sent to the Standards Department at Society Headquarters. Action will be taken to provide appropriate response in accordance with established procedures that ensure consensus on the interpretation.

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

Published by

**American Nuclear Society
555 North Kensington Avenue
La Grange Park, Illinois 60526 USA**

Copyright © 2007 by American Nuclear Society. All rights reserved.

Any part of this standard may be quoted. Credit lines should read "Extracted from American National Standard ANSI/ANS-15.4-2007 with permission of the publisher, the American Nuclear Society." Reproduction prohibited under copyright convention unless written permission is granted by the American Nuclear Society.

Printed in the United States of America

Foreword

(This Foreword is not part of American National Standard “Selection and Training of Personnel for Research Reactors,” ANSI/ANS-15.4-2007.)

The standard “Selection and Training of Personnel for Research Reactors,” ANS-15.4, was first published in 1977. It was revised in 1988 to incorporate requirements for requalification and medical competence of licensed or certified operations personnel. It is again being revised to reflect the considerable experience gained over the last decade and a half, to address changes in regulatory requirements and attitudes, and more importantly to fully incorporate the concept of performance-based selection and training of personnel. The standard is designed to be easily adopted by the wide range of research reactors in operation in the United States and abroad.

Administrative and organizational requirements and structures, including reviews and audits, are found in a companion standard, “The Development of Technical Specifications for Research Reactors,” ANSI/ANS-15.1-2007.

Critical facilities and fast pulse reactors should rely on the existing standards “Conduct of Critical Experiments,” ANS-1, and “Operation of Fast Pulse Reactors,” ANS-14.1, and should use ANS-15.4 to supplement these standards to the extent applicable.

The family of research reactor standards that would be helpful for operators, users, and regulators of these facilities are the following:

ANSI/ANS-15.1-2007, “The Development of Technical Specifications for Research Reactors”
ANSI/ANS-15.2-1999, “Quality Control for Plate-Type Uranium-Aluminum Fuel Elements”
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 Material (SNM) by Research Reactor Facilities” (withdrawn)

ANS-15.20-20xx, “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 ANS-15.4 Working Group that developed the standard under the auspices of Subcommittee ANS-15, Operation of Research Reactors, was composed of

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

E. Ehrlich, *General Electric Company*
W. J. Eresian, *U.S. Nuclear Regulatory Commission*
D. J. Feltz, *Consultant*
M. M. Mendonca, *U.S. Nuclear Regulatory Commission*
S. O’Kelly, *University of Texas*
W. J. Richards, *National Institute of Standards and Technology*
T. R. Schmidt, *Sandia National Laboratories*
R. Seale, *University of Arizona*
E. G. Tourigny, *U.S. Department of Energy*
W. G. Vernetson, *University of Florida*
W. L. Whittemore, *General Atomics*

Subcommittee ANS-15, Operation of Research Reactors, had the following membership at the time of approval of this standard:

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 N-17, Research Reactors, Reactor Physics, Radiation Shielding and Computational Methods, had the following membership at the time it reviewed and approved the 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. Hertel, *Georgia Institute of Technology*
W. A. Holt, *American Public Health Association*
W. C. Hopkins, *Individual*
M. A. Hutmaker, *U.S. Department of Energy*
L. I. Kopp, *Individual*
P. M. Madden, *U.S. Nuclear Regulatory Commission* (Alt. A. Adams, *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*

Contents	Section	Page
	1 Scope	1
	2 Definitions	1
	3 Functional levels and assignments of responsibility	2
	3.1 General	2
	3.2 Level 1	2
	3.3 Level 2	2
	3.4 Level 3	2
	3.5 Level 4	3
	3.6 Other technical personnel	3
	4 Qualification	3
	4.1 General	3
	4.2 Level 1	3
	4.3 Level 2	3
	4.4 Level 3	3
	4.5 Level 4	3
	4.6 Other technical personnel	3
	5 Initial training and licensing	3
	5.1 General	3
	5.2 Initial training	4
	5.3 Training methods	4
	5.3.1 General	4
	5.3.2 Classroom methods	4
	5.3.3 Self-study methods	4
	5.3.4 On-the-job training methods	4
	5.3.5 Other methods	4
	5.4 Examinations	4
	5.5 Examination administration and evaluation	5
	5.6 Medical examination	5
	5.7 Licensing	5
	5.8 Special or limited license	5
	5.9 Other technical personnel	5
	6 Requalification and relicensing	6
	6.1 General	6
	6.2 Requalification program	6
	6.2.1 Refresher training	6
	6.2.2 Written examination	6
	6.2.3 Medical examination	6
	6.2.4 Reactivity control manipulations	6
	6.2.5 Operating test or evaluation	6
	6.2.6 Document review	6
	6.3 Evaluation and retraining	7
	6.4 Relicensing	7
	6.5 Absence from licensed functions	7
	6.6 Exemptions	7

7	Medical certification and monitoring or licensed personnel	7
7.1	Health evaluation responsibility	7
7.1.1	General aspects	7
7.1.2	Medical examination frequency	7
7.2	Health requirements and disqualifying conditions	8
7.2.1	Basis of requirements	8
7.2.2	General requirements	8
7.2.3	Disqualifying conditions	8
7.2.4	Specific minimum capacities required for medical qualification	9
7.2.5	Additional examination	10
7.3	Waiver or limited approval	10
7.3.1	Application requirements and criteria	10
7.3.2	Limited approval	10
7.4	Medical examination documentation	10
8	Fitness for duty	10
9	Documentation and records	11
9.1	Documentation	11
9.2	Records	11
10	References	11