American Nuclear Society

REAFFIRMED
November 16, 2010
ANSI/ANS-8.6-1983 (R2010)
August 24, 2017
ANSI/ANS-8.6-1983 (R2017)

safety in conducting subcritical neutron-multiplication measurements in situ

an American National Standard

REAFFIRMED
July 23, 2001
ANSI/ANS-8.6-1983
(R2001)

This standard has been reviewed and reaffirmed with the recognition that it may reference other standards and documents that may have been superseded or withdrawn. The requirements of this document will be met by using the version of the standards and documents referenced herein. It is the responsibility of the user to review each of the references and to determine whether the use of the original references or more recent versions is appropriate for the facility. Variations from the standards and documents referenced in this standard should be evaluated and documented.
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

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

ANSI/ANS-8.6-1983 (R2001)

American National Standard for Safety in Conducting Subcritical Neutron-Multiplication Measurements In Situ

Secretariat
American Nuclear Society

Prepared by the
American Nuclear Society
Standards Committee
Subcommittee ANS-8

Published by the
American Nuclear Society
555 North Kensington Avenue
La Grange Park, Illinois 60525 USA

Approved May 16, 1983
by the
American National Standards Institute, Inc.

American National Standard

An American National Standard implies a consensus of those substantially concerned with its scope and provisions. An American National Standard is intended as a guide to aid the manufacturer, the consumer, and the general public. The existence of an American National Standard does not in any respect preclude anyone, whether he has approved the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standard. American National Standards are subject to periodic review and users are cautioned to obtain the latest editions.

CAUTION NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of publication. Purchasers of this standard may receive current information, including interpretation, on all standards published by the American Nuclear Society by calling or writing to the Society.

Published by

American Nuclear Society
555 North Kensington Avenue, La Grange Park, Illinois 60525 USA

Price: $10.00

Printed in the United States of America

Foreword

(This Foreword is not a part of American National Standard for Safety in Conducting Subcritical Neutron-Multiplication Measurements In Situ, ANSI/ANS-8.6-1983.)

Safety guidance for operations with fissile material may be obtained from observations of the changes in neutron field arising from alterations in the quantity or arrangement of the fissile material. Measurements of such changes are common in critical facilities, but in some cases industrial safety guidance may be derived more effectively from measurements in the process area. This standard prescribes techniques and methods for making such measurements safely with fissile materials in process areas or in installed process equipment.

The standard was initiated in 1966 and a proposal was prepared by the sponsor in 1968. An American National Standards Committee processed and approved the proposal in 1969, and it was published as ANSI N16.3-1969. The prescribed five-year review resulted in minor changes and its issuance as American National Standard N16.3-1975/ANS-8.6. The present revision is the result of the second five-year review under the aegis of Subcommittee 8 of the Standards Committee of the American Nuclear Society. The present review was managed by Dr. H. C. Paxton of Los Alamos National Laboratory. This revision restates two provisions more specifically and clarifies two others.

The responsible Subcommittee, ANS-8, Fissionable Materials Outside Reactors, had the following membership at the time it approved this revision:

J. D. McLendon, Chairman, *Union Carbide Corporation, Nuclear Division*
Elizabeth B. Johnson, Secretary, *Oak Ridge National Laboratory*
F. M. Alcorn, *Babcock and Wilcox Company*
H. K. Clark, *Savannah River Laboratory*
E. D. Clayton, *Battelle Pacific Northwest Laboratories*
D. M. Dawson, *General Electric Company*
Norman Ketzlach, *U. S. Nuclear Regulatory Commission*
W. G. Morrison, *Exxon Nuclear Idaho Company, Inc.*
David R. Smith, *Los Alamos National Laboratory*
J. T. Thomas, *Oak Ridge National Laboratory*
G. E. Whitesides, *Oak Ridge National Laboratory*
F. E. Woltz, *Goodyear Atomic Corporation*

American National Standards Committee N16, Nuclear Criticality Safety, which reviewed and approved this standard in 1982, had the following membership:

Dixon Callihan, Chairman
Elizabeth B. Johnson, Secretary

Organization	*Representative*
Allied-General Nuclear Services	William R. Waltz
American Institute of Chemical Engineers	Alex F. Perge
American Nuclear Society	Dixon Callihan
American Society for Testing of Materials (Liaison only)	Ricardo Artigas
Atomic Industrial Forum, Inc.	D. Frank Cronin
Exxon Nuclear Company	Leo E. Hansen
Health Physics Society	Fred W. Sanders
	Norman C. Dyer (Alt.)
Institute of Nuclear Materials Management	Leo E. Hansen
U.S. Department of Energy	Lorin C. Brinkerhoff
U.S. Nuclear Regulatory Commission	George H. Bidinger
Individual Members	C. Leslie Brown
	Elizabeth B. Johnson
	Hugh C. Paxton

Contents

Section — Page

1. Introduction 1

2. Scope 1

3. Definitions 1
   3.1 Limitations 1
   3.2 Shall, Should, and May 1
   3.3 Glossary of Terms 1

4. Administrative Practices 2

5. Equipment Criteria 2

6. Operational Practices 2

7. Reference 3