American Nuclear Society

REAFFIRMED

July 15, 2005
ANSI/ANS-8.15-1981
(R2005)

nuclear criticality control of special actinide elements

an American National Standard

WITHDRAWN

October 10, 2014
ANSI/ANS-8.15-1981
(R2005)

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reviewed and reaffirmed with the recognition that it may reference other standards and documents that may have been superseded or withdrawn.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.

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 This standard may contain outdated material or may have been superseded by another standard.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-8.15-1981 (R2005)

American National Standard for Nuclear Criticality Control of Special Actinide Elements

Secretariat
American Nuclear Society

Prepared by the
American Nuclear Society
Standards Committee
Work Group ANS-8.15

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

Approved November 9, 1981
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CAUTION NOTICE: This American National Standard may be revised or withdrawn at any time.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: $25.00

Printed in the United States of America

Foreword

(This Foreword is not a part of American National Standard for Nuclear Criticality Control of Special Actinide Elements, ANSI/ANS-8.15-1981.)

This standard provides guidance for the prevention of criticality accidents in the handling, storing, processing and transporting of special actinide elements. Subcritical mass limits are provided for fourteen nuclides beginning with ^{237}Np and ending with ^{251}Cf. The standard constitutes an extension of American National Standard for Nuclear Criticality Safety in Operations With Fissionable Materials Outside Reactors, N16.1-1975 (ANS-8.1). The subcritical limits in the standard are in some cases substantially less than the estimated minimum critical values. This is to account for uncertainties in calculations. In view of the limited availability of most of the nuclides in the near term, there was no reason to push the limits to higher values. The limits are considered adequate for current needs.

In addition, the heat generation from alpha particle decay may in some cases actually be the more limiting factor that controls the quantity of nuclear material assembled.

This standard was prepared by Work Group ANS-8.15, composed of:

E. D. Clayton, Chairman, *Battelle Pacific Northwest Laboratories*
J. E. Bigelow, *Oak Ridge National Laboratory*
H. K. Clark, *Savannah River Laboratory*
G. E. Hansen, *Los Alamos National Laboratory*
C. R. Richey, *Battelle Pacific Northwest Laboratories*
D. R. Smith, *Los Alamos National Laboratory*
J. T. Thomas, *Union Carbide Corporation, Nuclear Division*
R. M. Westfall, *Union Carbide Corporation, Nuclear Division*
F. E. Woltz, *Goodyear Atomic Corporation*

This standard was prepared under the direction of Subcommittee 8, Fissionable Materials Outside Reactors, of the Standards Committee of the American Nuclear Society (ANS). The membership of this Subcommittee at the time of preparation was:

J. D. McLendon, Chairman, *Union Carbide Corporation, Nuclear Division*
E. 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*
N. Ketzlach, *U. S. Nuclear Regulatory Commission*
W. G. Morrison, *Exxon Nuclear Idaho Company, Inc.*
D. R. Smith, *Los Alamos National Laboratory*
J. T. Thomas, *Union Carbide Corporation, Nuclear Division*
G. E. Whitesides, *Union Carbide Corporation, Nuclear Division*
F. E. Woltz, *Goodyear Atomic Corporation*

The American National Standards Committee N16, Nuclear Criticality Safety, which reviewed and approved this standard in 1981, had the following membership:

Dixon Callihan, Chairman
E. B. Johnson, Secretary

Organization	*Representative*
Allied-General Nuclear Services	W. R. Waltz
American Institute of Chemical Engineers	A. F. Perge
American Nuclear Society	Dixon Callihan
American Society for Testing and Materials	Ricardo Artigas
Atomic Industrial Forum	D. F. Cronin
Exxon Nuclear Company	L. E. Hansen
Health Physics Society	F. W. Sanders
	F. F. Haywood (Alt.)
Institute of Nuclear Materials Management	L. E. Hansen
U. S. Department of Energy	Lorin Brinkerhoff
U. S. Nuclear Regulatory Commission	R. L. Stevenson
Individual Members	C. L. Brown
	E. B. Johnson
	Hugh Paxton

Contents