

American Nuclear Society

REAFFIRMED

May 31, 2012
ANSI/ANS-8.23-2007 (R2012)

**nuclear criticality accident
emergency planning and response**

an American National Standard

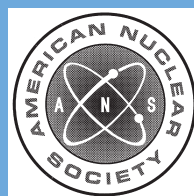
WITHDRAWN

September 16, 2019
ANSI/ANS-8.23-2007 (R2012)

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 This standard may contain outdated material or may have been superseded by another standard.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.

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reviewed and reaffirmed with the recognition that it may reference other standards and documents that may have been superseded or withdrawn.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-8.23-2007

**American National Standard
Nuclear Criticality Accident
Emergency Planning and Response**

Secretariat
American Nuclear Society

Prepared by the
**American Nuclear Society
Standards Committee
Working Group ANS-8.23**

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

Approved March 23, 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-8.23-2007 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 a part of American National Standard “Nuclear Criticality Accident Emergency Planning and Response,” ANSI/ANS-8.23-2007.)

This standard provides criteria for emergency planning and response to a nuclear criticality accident for facilities outside reactors that process, store, or handle fissionable material. This standard assumes that an alarm system that complies with American National Standard “Criticality Accident Alarm System,” ANSI/ANS-8.3-1997 (R2003), is in place. This standard focuses on those elements of planning and response needed specifically in the event of a criticality accident. It is not a general emergency planning and response standard.

This revision adds three appendices. The appendices are intended to assist technical staff in fulfilling some of their responsibilities noted in this standard. Few changes were made to the body of the standard. Section 4.1(9) was revised because it was noted that a system to read dosimeters is needed to obtain useful information from them. Section 5.1 was revised to emphasize that accident characterization is done to support emergency response planning. Section 7 was reformatted without sub-subsections because reentry, rescue, and stabilization are interrelated topics.

The working group would like to gratefully acknowledge the contributions by Ichiro Nojiri, who died prior to the publication of this revision.

This standard was prepared by Working Group ANS-8.23, composed of the following members:

J. S. Baker (Chair), *Los Alamos National Laboratory*

D. E. Cabrilla, *U.S. Department of Energy*

R. W. Carson, *Babcock & Wilcox Company*

D. M. D’Aquila, *U.S. Enrichment Corporation*

C. M. Hopper, *Oak Ridge National Laboratory*

C. S. Lim, *Atomic Energy of Canada Limited, Chalk River Laboratories*

I. Nojiri, *Japan Nuclear Cycle Development Institute*

V. L. Putman, *Bechtel BWXT Idaho, LLC*

R. L. Reed, *Washington Safety Management Solutions, LLC*

R. W. Tayloe, Jr., *Individual*

H. W. Webb, *Nuclear Fuel Services, Inc.*

This revised standard was prepared under the guidance of ANS Subcommittee 8, Fissionable Materials Outside Reactors, which had the following membership at the time of its approval of this revision:

T. P. McLaughlin (Chair), *Individual*

J. A. Schlessler (Secretary), *Washington Safety Management Solutions, LLC*

F. M. Alcorn, *Individual*

H. D. Felsher, *U.S. Nuclear Regulatory Commission*

A. S. Garcia, *U.S. Department of Energy*

N. Harris, *British Nuclear Fuels, PLC*

B. O. Kidd, *BWX Technologies, Inc.*

R. A. Libby, *Pacific Northwest National Laboratory*

D. A. Reed, *Oak Ridge National Laboratory*

T. A. Reilly, *Individual*

H. Toffer, *Fluor Federal Services*

G. E. Whitesides, *Individual*

Consensus Committee N16, Nuclear Criticality Safety, had the following membership at the time of its approval of this standard:

C. M. Hopper (Chair), *Oak Ridge National Laboratory*

R. A. Knief (Vice Chair), *Sandia National Laboratories*

G. H. Bidinger, *Individual*

R. D. Busch, *University of New Mexico*

R. S. Eby, *American Institute of Chemical Engineers*
M. A. Galloway, *U.S. Nuclear Regulatory Commission*
C. D. Manning, *AREVA NP*
S. P. Murray, *Health Physics Society*
R. E. Pevey, *University of Tennessee*
R. L. Reed, *Washington Safety Management Solutions, LLC*
B. M. Rothleder, *U.S. Department of Energy*
W. R. Shackelford, *Nuclear Fuel Services, Inc.*
R. G. Taylor, *INM Nuclear Safety Services*
R. M. Westfall, *Oak Ridge National Laboratory*
L. L. Wetzel, *BWX Technologies, Inc.*
R. E. Wilson, *U.S. Department of Energy*

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 Responsibilities	1
	4.1 Management responsibilities	1
	4.2 Technical staff responsibilities	2
	5 Emergency response planning	2
	5.1 Evaluation	2
	5.2 Emergency response plan	2
	5.3 Equipment	3
	6 Evacuation	3
	7 Reentry, rescue, and stabilization	4
	8 Classroom training, exercises, and evacuation drills	4
	8.1 Classroom training	4
	8.2 Exercises	5
	8.3 Evacuation drills	5
	9 References	5
	Bibliography	6
	Appendices	
	Appendix A Selection and Use of Radiation Protection Instrumentation for Emergency Response to a Nuclear Criticality Accident	7
	Appendix B Criticality Specialist Emergency Response Resources	12
	Appendix C Nuclear Criticality Accident Emergency Response Exercises	13