ANSI/ANS-8.10-2015

ANS

Criteria for Nuclear Criticality Safety Controls in Operations with Shielding and Confinement

An American National Standard

Published by the
American Nuclear Society
555 N. Kensington Ave
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Criteria for Nuclear Criticality Safety Controls in Operations with Shielding and Confinement

Secretariat
American Nuclear Society

Prepared by the
American Nuclear Society
Standards Committee
Working Group ANS-8.10

Published by the
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American National Standard

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(3) the purposes of the inquiry;

(4) the inquiry stated in a clear concise manner; and

(5) a proposed reply, if the inquirer is in a position to offer one.

Inquiries should be addressed to

American Nuclear Society
ATTN: Standards Administrator
555 N. Kensington Avenue
La Grange Park, IL 60526

or standards@ans.org

Foreword

(This Foreword is not a part of American National Standard, "Criteria for Nuclear Criticality Safety Controls in Operations with Shielding and Confinement," ANSI/ANS-8.10-2015.)

This standard amplifies the conditions necessary for the control of criticality in fissionable materials set forth in American National Standard "Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors," ANSI/ANS-8.1-2014. Criteria for the prevention of criticality accidents are presented herein for facilities that provide adequate protection for personnel and the public against radiation and releases of radioactive materials resulting from accidental criticality. The radiation dose limits contained in the 1983 version of this standard were reexamined. The recommended radiation doses in Section 4.2.1 of this standard were adjusted to be consistent with Section 5.9 of ICRP 103 (2007). This standard recognizes the usefulness and protective features of shielding against radiation and confinement of radioactive materials and allows a relaxation of criticality safety criteria when shielding and confinement meet criteria specified in this standard. If personnel are located remotely from the fissionable materials, distance may serve in lieu of some or all of the shielding. In the context of this standard, the shielding and confinement properties may exist because of the radioactive material processed in normal operations, or they may be designed into the facility expressly to protect against the effects of criticality accidents.

This standard was initiated as the result of a survey conducted in September 1968 to establish the need for and the feasibility of such a standard. A working group was appointed by Subcommittee 8 of the Standards Committee of the American Nuclear Society in November 1968, and the first draft was submitted in June 1969. In response to comments and discussions, the working group subsequently prepared twelve succeeding drafts over a five-year period. Some of the later revisions were the consequence of recommendations from American National Standard Committee N16 during 1972. The standard was then adopted by the American National Standards Committee N16 in 1974 under the title "Criteria for Nuclear Criticality Safety Controls in Operations Where Shielding Protects Personnel."

The prescribed five-year review of N16.8-1975/ANS-8.10 leading to ANSI/ANS-8.10-1983 was performed by a working group of Subcommittee 8 of the ANS Standards Committee, the originating body. The working group was composed of B. F. Gore and E. D. Clayton of the Battelle Pacific Northwest Laboratories. They recommended a single substantive change in the standard along with minor wording changes in the standard and in its title to reflect the broadened content. ANSI/ANS-8.10-1983 defined a criterion for determining the adequacy of a facility's confinement of radioactive materials under accident conditions based upon a maximum radiation dose that could be received by a member of the public located outside the restricted area surrounding the facility. Definition of this criterion removed perceived ambiguity in the wording of the previous version.

This standard might reference documents and other standards that have been superseded or withdrawn at the time the standard is applied. A statement has been included in the references section that provides guidance on the use of references.

This standard does not incorporate the concepts of generating risk-informed insights, performance-based requirements, or a graded approach to quality assurance. The user is advised that one or more of these techniques could enhance the application of this standard.

This revision of American National Standard ANSI/ANS-8.10-2015 was prepared by Working Group ANS-8.10 of Subcommittee 8 of the Standards Committee of the

American Nuclear Society. Working Group ANS-8.10 had the following membership at the time of the Revision:

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L. M. Farrell, *AREVA Inc.*
J. Hicks, *U.S. Department of Energy*
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L. E. Paulson, *GE Hitachi, Nuclear Energy*

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:

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The American Nuclear Society Nuclear Criticality Safety Consensus Committee had the following membership at the time of its approval:

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