ANSI/ANS-8.21-2023

Use of Fixed Neutron Absorbers in Nuclear Facilities Outside Reactors

An American National Standard

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American National Standard Use of Fixed Neutron Absorbers in Nuclear Facilities Outside Reactors

Secretariat
American Nuclear Society

Prepared by the
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American National Standard

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5200 Thatcher Rd., Suite 142
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Foreword

(This foreword does not contain any requirements of American National Standard ANSI/ANS-8.21-2023, *Use of Fixed Neutron Absorbers in Nuclear Facilities Outside Reactors*, but is included for informational purposes.)

Nuclear criticality safety is an essential part of the safety assessment of a facility or an operation involving fissile material. Designers, operators, safety professionals, regulators, and standard writing groups dealing with nonreactor nuclear facilities need to address nuclear criticality safety. This standard provides guidance on the use of fixed neutron absorbers as an integral part of nuclear facilities equipment, fissile material, or process equipment outside reactors, where credit is given for such neutron absorbers to provide criticality safety control. This revision to the standard includes the intent and essential constituents of ANS-8.5-1996 (R2022) (withdrawn), *Use of Borosilicate-Glass Raschig Rings as a Neutron Absorber in Solutions of Fissile Material*. For soluble neutron absorbers, see ANSI/ANS-8.14-2004 (R2021), *Use of Soluble Neutron Absorbers in Nuclear Facilities Outside Reactors*. This standard, ANSI/ANS-8.21-2023, utilizes the term "fissile material" throughout, consistently with glossaries established for American Nuclear Society (ANS) criticality safety standards. For the purposes of this standard, the term "fissionable material" is not appropriate since there is no experience from operations with fissionable materials, outside of reactor cores and with a credible criticality hazard, that are not also fissile materials. This standard may not be applicable to operations with such fissionable materials.

This standard might reference documents and other standards that have been superseded or withdrawn at the time the standard is applied.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 standard was prepared by the ANS-8.21 Working Group of the American Nuclear Society. The following members contributed to this standard:

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