ANSI/ANS-2.29-2020

ANS

# Probabilistic Seismic Hazard Analysis

An American National Standard

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American Nuclear Society
555 N. Kensington Ave
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# American National Standard Probabilistic Seismic Hazard Analysis

Secretariat
**American Nuclear Society**

Prepared by the **American Nuclear Society Standards Committee Working Group ANS-2.29**

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## Foreword

(This foreword does not contain any requirements of American National Standard "Probabilistic Seismic Hazard Analysis," ANSI/ANS-2.29-2020, but is included for informational purposes.)

This standard establishes requirements for performing probabilistic seismic hazard analyses (PSHAs). It is one of a group of five standards that address the seismic design process for nuclear facilities. The overall objective of these standards is to achieve a risk-informed design that protects the public, the environment, and workers from potential consequences of earthquakes.

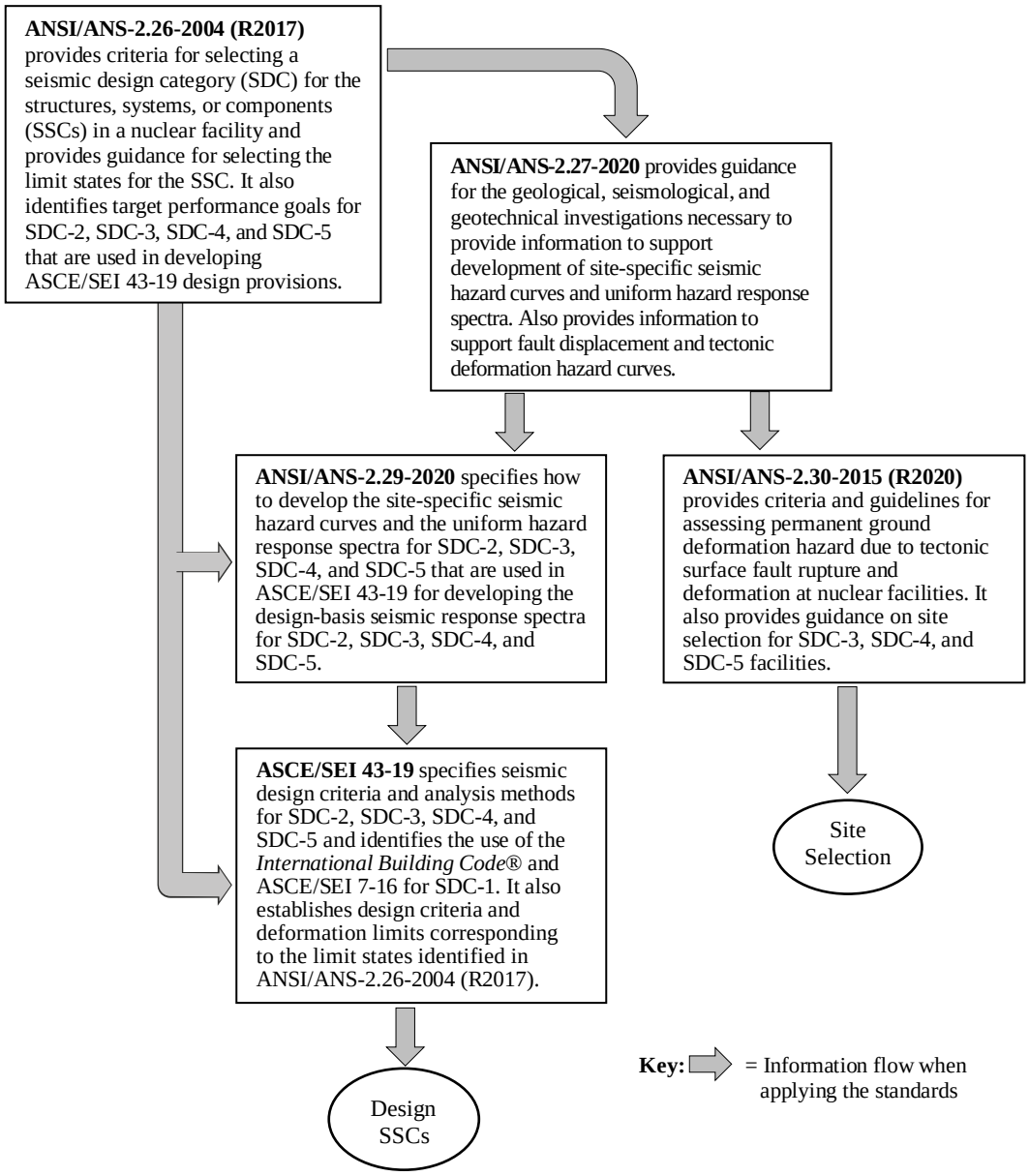


**Figure A – The set of standards that operate together to inform the assessment of seismic hazards and seismic design at nuclear facilities.**

Figure A shows the relationship between this standard and the other four seismic standards: ANSI/ANS-2.26-2004 (R2017), "Categorization of Nuclear Facility Structures, Systems, and Components for Seismic Design"; ANSI/ANS-2.27-2020, "Criteria for Investigations of Nuclear Facility Sites for Seismic Hazard Assessments"; ANSI/ANS-2.30-2015 (R2020), "Criteria for Assessing Tectonic Surface Fault Rupture and Deformation at Nuclear Facilities"; and ASCE/SEI 43-19, "Seismic Design Criteria for Structures, Systems, and Components in Nuclear Facilities." The procedural relationship among these standards is further described in ANSI/ANS-2.26-2004 (R2017). The user should consult ASCE/SEI 43-19 to see how the information produced by this standard (ANSI/ANS-2.29-2020) is used in developing seismic loads specific to a structure, system, and (or) component (SSC).

As described in ANSI/ANS-2.26-2004 (R2017) and ASCE/SEI 43-19, the seismic design process for nuclear facilities is based on the consequences of seismically initiated failure of SSCs and specified limit states and design requirements. The seismic design categories identified in ANSI/ANS-2.26-2004 (R2017) and the design requirements in ASCE/SEI 43-19 aim to satisfy target performance goals defined in terms of the annual frequency of exceeding specified SSC performance.

Achieving a target performance goal is directly related to the frequency of a seismic load. Therefore, the results of a PSHA are required as input to the seismic design process. This standard establishes procedures for performing a PSHA needed to support selection of the seismic loads used in ASCE/SEI 43-19. The methods specified herein can also be used to support other applications, such as seismic probabilistic risk analyses.

The working group has incorporated risk-informed and/or performance-based requirements into this standard. 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 was prepared by the ANS-2.29 Working Group of the American Nuclear Society. The following members contributed to this standard:

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